

the skeptic

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A journal of fact and opinion

Paul Davies on 'Alien visits'

Peter Bowditch on 'Y2K'

Paul Davies

side Convention Centre

Ian Plimer on 'The threat from space'!

THE NATIONAL
CONFERENCE

the Skeptic

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Notice to Subscribers

Many subscriptions will fall due with this issue, so we have introduced another method of reminding those who are about to be come unsubscribed to get their subscriptions in the mail and those who still have some time to run, *not* to send us any more money.

The former single sheet *Watsonware* (WoW), listing the coming attractions being promoted by the various state groups, has metamorphosed into a four-page insert, *WatsOnWare* (note the subtle typographic change?) under the editorship of Steve Roberts. If your sub is due, you should receive a pink version and if your sub is still current you should receive a yellow one. If you suffer from the extremely rare pink/yellow version of colour blindness, give us a call and we will let you know the status of your sub. (If you are an ophthalmologist who knows there's no such thing, please don't destroy our illusions.)

Because this is the season of crass commercialism, and because we are always keen to increase the number of subscribers, we have come up with an idea that we hope will will save you time in deciding what to give that 'difficult' relative or friend. Page 4 of WoW has a renewal notice and a gift subscription form. If you take out a Gift Sub before December 31 (The End Of The World As We Know It), the lucky giftee will receive not only a full subscription of four issues for 2000, but also a copy of this issue (19:4) and a package of four, randomly selected, back issues from the late 1980s or early 1990s. These will be accompanied by a colourful Gift Certificate with your (brief) message inscribed thereon.

The subscription has, in line with the expected introduction of the GST in July, been increased by \$2 to take account of the new tax. Three year subscriptions have been increased by \$10.

May we wish our subscribers all the best for the holiday season, with the hope that we can continue to inform and amuse you throughout 2000 (which is *not* the beginning of new millennium, whatever anyone says to the contrary).



Around the traps

Bunyip

Just in case readers are inclined to see the Skeptics as nothing but a bunch of killjoy nerds with no finer feelings and a propensity to destroying other people's illusions, we'd like to bring you a story that might change your minds.

At the meeting NSW Skeptics held at the Royal North Shore Hospital last year, one at which we discussed alternative "healing", a long-time subscribers, astrophysicist Andre Phillips, overheard another subscriber, medical practitioner Claire Milton, having a heated debate with a proponent of acupuncture. The acupuncturist was heard to say "Doctors don't care about their patients" to which Claire responded as one would expect any dedicated medico to.

We'll let Andre continue: "Afterwards when I first spoke with Claire and asked what she made of it all, the first words that tumbled out of her mouth were, 'what a load of ****!!'. I knew it was love!"

Andre and Claire were married in October and we at Skeptics Central (Cupid Div) wish them all the best for a long and happy future together

* * *

We were somewhat astonished to see that Dr Victor Chang has been named as Australian of the Century, and that he was selected from a short list of four, the other three being Don Bradman, Dawn Fraser and Fred Hollows.

Not that we regard Dr Chang as an inappropriate winner and we agree that the four people named are or were very great Australians indeed, pre-eminent in their particular fields. Dr Chang and Prof Hollows were great humanitarians and doctors, people of whom all Australians should be rightly proud. Sir Donald Bradman and Dawn Fraser have rightly been lauded as at the very pinnacle of their particular (or any other) sporting fields and all of them are worthy of the high honours they have received throughout their lives.

But it is not to denigrate these people to ask, how can any such list leave out the name of Howard Florey, surely the Australian whose work has had the most beneficial impact on the most people in this, or any other century?

* * *

The increasing promotion and acceptance of alternative medicines today brings back memories to those of us who are no longer in the first flush of youth, of the patent medicines that were advertised on the wireless of yesteryear.

Who, having once heard it, can forget the heather encrusted voice of Dr MacKenzie intoning "Men-th-oi-ds" with a rising inflection on the last letter? Or the euphonious "Sip, siip, siiip" that denoted the ingestion of a draught of Bonnington's Irish Moss (did it really contain "oxymel of carraheen" or does memory play us false? And what the hell is oxymel of carraheen anyway?) Or the howling blizzard noises in the background of the ad for Buckley's Canadiol Mixture ("They breed em tough in the Yukon"). What was listed on the Diet Chart that accompanied Ford Pills ("are you too fat, too fat, too fat")? Were Carter's Little Liver Pills so named because the pills were little, or were they only efficacious for people with little livers? And would these have helped the people who took "Vincent's, with confidence, for quick three-way relief" only to have their livers collapse some years later? Were Beecham's Pills really "Worth a guinea a box"? And can anyone remember with anything less than revulsion the emulsified cod liver oil, once forced down childish throats, under the brand names of Scott's Emulsion or Hypol? (In a startling proof of the Jungian concept of "synchronicity", immediately after the previous sentence was written Dr Norman Swan was heard on ABC radio - no longer wireless - talking about cod liver oil!)

Questions for our ever truth-seeking readers:

what, if anything, did these pills and potions actually do?
are any of them still available?
what other ones can you remember?

* * *

We are most grateful to subscriber, Malcolm Cluett, who sent us a couple of newspaper clippings recently. One was a news report that a professor had

said at a technology conference that as our politicians were largely scientifically and technologically illiterate, we stood to miss out on advances in biotechnology in the future.

As if to confirm the professor's gloomy prediction, the other clipping from a "lifestyle" supplement had a piece about the Federal Opposition spokeswoman on information technology (which surely is a little bit technological), Senator Kate Lundy, in which she revealed what she had "bookmarked" on her computer. Nestled among the unexceptionable sites one could expect a bright, up-and-coming future minister to list, was *Astrology.net*, which she described as "An Australian online success story, with everything you need to know about your horoscope."

It strikes us that this is about the equivalent of the Treasurer or Shadow Treasurer advocating solving our economic problems by sending the Treasury's bank account number to Nigeria.

Everything you *really* need to know about your horoscope, Senator, could be found on the back of a postage stamp.

* * *

In the past we have catalogued the constant stream of creationists leaving our shores for more lucrative pastures in the USA but this is not the end of bad ideas for export.

While the editor was in the UK recently, news came from Scotland of the death there from starvation an Australian woman follower of the ludicrous "breatharian" teachings of Brisbane guru Jasmuheen (story this issue). Further evidence came in a radio debate on the pros and cons of immunisation, where an opponent of the practice said that the best information for the anti side came from Australia (also a story in this issue). Add to this the increasing overseas interest in "liver cleansing diets" and you begin to wonder what we are inflicting on the world.

Could this all be categorised as Australia undergoing a no-brain drain?

* * *

Quarantine inspectors have a difficult job, but sometimes there might be a little light relief. We thank the reader who sent us a clipping from the *AQIS Bulletin* that described how a trainee officer at Sydney Airport was confronted with a passenger returning from the UK, carrying some sprigs of wheat. The passenger explained that he had been on a tour of crop circle sites and that he had been told by the tour guide that the wheat had had its DNA altered, and if the seeds were planted they would grow in the same pattern as the original circle. They were confiscated.

* * *

Cricket worshipping Skeptics (and we are legion - dung beetle worshippers are far less common) might have been outraged to hear that the Sheffield Shield is to be replaced as the symbol of supremacy in interstate competition by the Purina Milk Cup.

Is nothing sacred, they cry? (What a stupid question to ask in *the Skeptic*.) On the other hand, they might like to consider the implications of a foundation garment manufacturer sponsoring the competition. How would the Magilift D Cup look?

Surely there is a wealthy funeral director out there willing to support cricket by sponsoring the Rest in Peace Ashes series.

* * *

Still, we have to recognise that we live in a "cash for comment" (or anything else) world.

It seems to us that Skeptics SA president, Michelle Foster and her committee, missed a golden opportunity for sponsorship with their recent highly successful National Skeptics Conference. Why didn't they call it the Foster's National Skeptics Conference, which should at least have ensured unlimited free beer on tap during proceedings.

* * *

We are accustomed to hearing about "theories" about who built the pyramids, but a couple of recent ones stand out. First we were contacted by someone who has not only "proved" that Khufu's grand pile was a giant water pump, but is actually building a model pump based on the layout of the pyramid. You can check it out at:

<http://www.thepump.org>.

Then we received *THE TRUTH*, a modestly titled, self-published, annotated and serial-numbered, slim volume by one Thomas O Mills of Arizona. We haven't yet had time to digest this important work, but a quick scan reveals that Tom (we hope we can call him Tom) seems to regard the Giza pyramids as important elements in keeping the Earth in balance during its daily rotation. A bit like those lead weights the garage puts on your wheels when you have an alignment and balance job done.

We were very nearly convinced until we came across a reference Tom made to the constellation Leo (the Loin). We searched in vain for further aids to verisimilitude but couldn't find any references to Taurus (the Brisket) or Capricorn (the Chump Chop) and so were reluctantly forced to conclude that Tom has somewhat fewer than the optimum allocation of marbles.

* * *

Meanwhile, back in the real world, Egyptian authorities have stepped up security precautions around Giza for the night of December 31. Apart from the threat of Muslim extremist action against the large crowd of visitors expected to attend New Year celebrations in the locality, they also expect an influx of "pyramidiots" such as David Icke, the former British soccer player and now new age prophet of doom. Icke is among those cranks who are warning that US ex-president George Bush will summon evil forces at a black mass in the burial chamber inside the Khufu pyramid at midnight on that night. If Mr Bush is that influential, we can't help wondering why he lost an election to Bill Clinton.

* * *

In order to allay any fears that subscribers might have about buying tickets for next November's Third International Skeptics Convention in Sydney, we would like to state categorically that while we cannot be certain that the tickets will not contain any genetically modified ingredients, they most definitely will not contain any Socog.

* * *

Apropos the above, we've got mates. No, dear reader, it's no use your slapping your thigh and guffawing in incredulity, we really do have mates.

First there are our mates at a biographical institute in the USA who want to include us in their *Great Leaders of our Time* publication, and all they ask in return is that we buy a book - that's pretty friendly, isn't it? Also our mate, Boloba Ojo in Nigeria who wants to give us 30% of \$38 million (and US\$ at that) for nothing more than letting him use our bank account for a few days. That's a definitely matey sort of thing to do. Then there's our mate "J" who hails from Glen Waverley in Melbourne who keeps sending us clippings from a business magazine about how good some office supplies are and advising us to "give them a try".

We've got a few mates on the internet, too, the sort of blokes who are so disturbed at our impecunious state that they keep telling us how we can make thousands a week, and not having to leave home to do it.

Struth it's nice to be popular and have such generous mates.

* * *

In the never-ending search to find the weirdest web sites, we were bemused by the site "Atheists for Jesus" which nonplussed us more than a little. However, the cake for the most tasteless new age take-off site must be taken by <http://home.golden.net/~treleavn/toilet2.html> which purports to teach readers how to foretell the future by means of "Faecal Fortune Telling". Check out your future by reading the pan. We think it's a joke.


You are invited to let us know of other sites that might amuse without adding anything much to the sum of human knowledge.

* * *

On a much higher intellectual plane, readers who would like to sample the fruits of some serious research into weird web sites, should check the delightful page maintained by Peter Bowditch, one of the excellent list of speakers at the annual convention.

Peter runs a site named "Quintessence of the Loon" at:

<http://www.ratbags.com/loon> and the loons he cites are genuinely quintessential.

We don't know how he can expose himself to so much loonacy, while still maintaining his good humour, however he has been invited to join the NSW committee which is enough to test anyone's sense of humour. 

Conference round-up

The weekend of November 6-7 saw Skeptics SA hosting the 1999 Annual National Conference (Skeps SA, being unconventional, decided not to call it a convention) in the Adelaide Convention Centre, and what an outstanding conclave it was.

The venue was excellent and a large crowd gathered on Saturday morning to hear Mr Albert Bensimon, a prominent Adelaide businessman and generous supporter of the Skeptics and many other worthy causes, open the confer-

ence. Mr Bensimon, a jeweller spoke of some of the many marketing campaigns used by businesses in the past that could have done with a dose of Skeptical thinking.



Maciej Henneberg

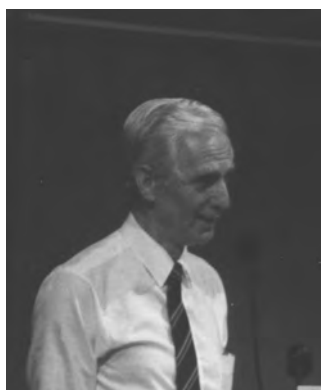
The first talk of the morning was scheduled to be "Skepticism and Food Myths" by Cath Kerry, the chef and manager of the Cafe at the Art Gallery of SA, but Ms Kerry had suffered a painful accident in the days preceding the conference and was unable to attend. She has promised



Who said all Skeptics have beards?

us a copy of her paper for a future issue. Her spot was successfully filled by Dr Max Wallace, who gave a reprise and update of his talk on "The Purple Economy" (the effects

of tax exemptions for religious institutions on tax income), the he had presented at the 1998 convention in Canberra. The next talk posed the question "Where did the Neandertals go?" by Prof Maciej Henneberg, Professor of Anthropological and Comparative Anatomy and Head of the Dept of Anatomical Science, University of Adelaide. He gave a history of the discovery of the discoveries of Neandertal remains and of the claims made about them, and, in answer to the question he posed, gave his opinion that Neandertals did not



Geoffrey Dean

go anywhere, they were part of the continuing process of human evolution and are still with us. We will publish Prof Henneberg's paper in a future issue.

A change of pace came with the next presentation, "The case for and against Astrology" was given by Dr Geoffrey Dean from the WA Skeptics. Geoff, formerly a scientist with CSIRO, and latterly a distinguished science writer, has spent 25 years studying astrology. He is widely recognised, by



Peter Bowditch

both Skeptics and believers, for the quality of his research. He spoke of recent research that might finally put to rest the claims of Michel Gauquelin, that the location of certain planets at the birth of individuals has a subtle effect on their career choices and prospects (the "Mars Effect"). This, while it gives no support at all to the claims of traditional astrology, still seemed to point towards some sort of celestial influence. Recent research strongly suggests that the data have been skewed by incorrect reporting of birth dates by fathers in the last

century. When this is removed, so too does the support for the Mars ef-



Steve Basser

fect. Geoff maintained that, while there is no evidence that astrology has any validity, nonetheless astrologers may well provide a useful service by providing a sympathetic ear to people with problems.

Peter Bowditch and Brian Watts, computer professionals, entertained with their talk "Y2K - Is it too late to Panic?" in which they took a Skeptical look at many of the claims made about Y2K computer problems. Peter's paper is published elsewhere in this issue.

Dr Stephen Basser, a general practitioner, spoke passionately on "Immunisation - Public Health or Public Menace?" in which he reprised and updated his article on this topic in the *Skeptic* (17:1), which has proved to be one of the most widely requested articles we



Paul Willis

have ever published. While critical of the sensationalism and lack of scientific rigour that characterises the anti-immunisation campaign, Stephen advocates a non-confrontational approach by medical practitioners in their dealings with patients who might have been seduced by this message. Some good news on this front came after the conference, with government figures being released showing that 96% of children between 5 and 12 have now been immunised against measles.

Dr Paul Willis, palaeontologist and ABC science communicator, asked "Where did the Media get it Wrong?" in which he described how stories go through a winnowing process on the way from occurrence



Brian Miller extols the virtue of wine and finds no dissenting voice.

to publication (broadcast) and how the final story often has little relationship to the original. He also sketched out methods by which Skeptics might have greater input into how their, often great, stories come across to the public.

Saturday's formal presentations concluded with wine expert, and SA committee member, Brian Miller conducting a "SA Wine Tour in One Room". Brian had arranged for the most characteristic wine from each of SA's five wine regions to be sampled, while giving a learned dissertation on the special characteristics of each type. This proved to be a most popular session, with the audience showing a dedication to personal research that did them great credit.

The annual Skeptic Dinner at the Norwood Function Centre was as convivial as this function has tradi-

tionally been. Guests were highly entertained by an after dinner talk "Pascal's Wager - how bizarre can it



Michael O'Donoghue

get?" by renowned author, Peter Goldsworthy. The winners of the 1999 Skeptic of the Year and Bent Spoon Award (see following story) were announced at the dinner by *Skeptic* editor, Barry Williams.

Sunday opened with Dr Michael O'Donoghue, senior lecturer in Religion Studies and Education at the University of SA, and Egyptologist, asking "Did the Egyptians Build the Pyramids?" He explored the evidence available from a number of sources that causes professionals in the field to answer that question with a resounding "Yes".

Prof Ian Plimer weighed in with "The Geology of Greenhouse", in which he described how the Earth has always, over billions of years, been a dynamic system and questioned how the current concerns about greenhouse conditions accord with historical reality. He pointed out that the planet is presently undergoing



Ian Plimer

very low concentrations of CO₂ compared with 80% of its history,



Paul Davies demonstrates curved space

none of which could have been attributed to human activity. He called for a better understanding of science

looked at popular perceptions of alien visitation and analysed the likelihood of their validity, given the hard equations of space and time. He ranged widely across many stories that have acquired seeming plausibility because of uncritical media reporting, and pointed out that most owed their acceptance to the ready public acceptance of conspiracy theories. His paper is published in this issue.

The alien contact theme was developed by Carol Oliver, Executive officer of the SETI Australia Centre at UWS, Macarthur, in her talk

ference of Australian Skeptics, and it is difficult to remember one which was better planned and presented. The speakers were outstanding and everything worked like clockwork. Brian Miller compered the whole affair with all the wit and style we have come to expect from him, and Michelle Foster and her committee have set a standard that will be hard to beat. On behalf of all Skeptics, we congratulate Michelle, Laurie, Chris, Alan, Brian, James, Nigel and all those others whose professionalism made it an outstanding success.

Well done you Crow Eaters.



No, not the Last Supper. The speakers' panel wraps up the show.

to allow people to make a more realistic assessment of media stories that are often sensationalised and designed to frighten. His descriptions of how extraterrestrial impacts have caused dramatic changes in Earth's climate is in this issue. A follow up article in a later issue will develop his points further.

Prof Paul Davies, renowned physicist and author of over 25 books on science, spoke of "Aliens on our Doorstep? Thoughts about the UFO Phenomenon", which

"SETI: Who said we're alone?". Carol spoke about SETI's scientific search for alien signals and how newly developed communications technology had increased the chances of finding signals, if they exist. It remains, however, a long shot, but one worth pursuing.

The conference concluded with a panel discussion in which all speakers still present took questions from the audience.

The extracurricular activities provided by the Skeptics SA crew were also very well planned and executed. Early arrivals from interstate, were treated to a Friday minibus tour of the Barossa Valley, sampling the product for which that locality is rightly renowned. Those who stayed on for Monday visited the notorious Yankalilla church with its alleged picture of either a Madonna and Child, or a grieving Aborigine (depending on who sees it). Steve Roberts gives his views in this issue.

This was the fifteenth annual con-



Carol Oliver



Michelle Foster closes the conference.

Worthy recipients of Skeptics' awards named

The annual Skeptics Dinner, held in conjunction with the national conference, was the forum for the announcement of the two annual Australian Skeptics awards, the Bent Spoon Award and the Australian Skeptic of the Year.

The Bent Spoon Award (presented to the perpetrator of the most preposterous piece of paranormal piffle) for 1999 had attracted a substantial number of nominations, including various media outlets, and also included a couple of political nominations, namely both the Australian Democrats for insisting that various untested 'alternative' therapies should be GST free, and the Federal Government for agreeing to it. A strong local candidate, in the person Father Andrew Nutter and his Yankalilla Anglican church with its 'miraculous' patch of bad plastering, was heavily favoured by the local smart money.

However, when it came to voting, the strong last minute run by the programme, *Signs from God* (9 Network), fronted by the formerly sceptical journalist, Michael Willesee, could not be ignored by the judges, and he was adjudged the very deserving winner. This programme, seeking to capitalise on the irrational millennial fears of many people, rehearsed a plethora (a most appropriate word in the circumstances) of bleeding and weeping statues, stigmatics and other pseudo-religious clap-trap. It sought to give this nonsense a patina of respectability by consulting various scientists and theologians, only to ignore their contributions in favour of sensationalism. Despite its claims of sceptical investigation, this show differed in no significant way from the rash of other nasty millennial doom-crying tripe being pushed down our throats by TV channels as the calendar rolls along towards 2000.

Playing on people's fears might be good for ratings, but it ignores the real harm that it can do to vulnerable people whose grasp on reality is in some way under attack. As too often happens after one of these irresponsible pieces has been to air, Australian Skeptics was contacted by a seriously distressed woman who had been so disturbed by what she had seen that



she feared for her sanity. We could only tell her that such programmes were "junk TV" and were designed to rate and not to inform.

After the Bent Spoon we had the pleasure of announcing the winner of our Australian Skeptic of the year (presented to a person whose activities have contributed most to the promotion of critical thinking). In past years this award has gone to distinguished scientists, Profs Derek Freeman, Peter Doherty and Michael Archer. This year's award represented a break with the tradition, when we named a woman who has conducted an almost single-handed campaign to expose to critical scrutiny the potentially dangerous unsubstantiated claims made by manufacturers of various electronic gadgets that are alleged to cure every known illness. She is a modest woman who seeks no personal publicity, and for this reason, and because of her concerns about threats she has received, at her request, we will name her only as Nurse Cheryl.

Cheryl was a nurse working for an overseas aid agency who, through her duties, suffered from a debilitating injury that reduced her ability to work. She returned to Australia where, finding that orthodox medicine could do little to alleviate her pain and suffering, she sought the attention of various "alternative" practitioners. It was this experience that caused Cheryl to begin her campaign to expose the claims made by promoters of various "cure-all" therapies to the light of critical inquiry. Her own knowledge of medicine told her that no one type of treatment could possibly be efficacious against the wide range of ailments that affect people, yet this is precisely the sort of claims that are made, particularly by those who peddle various electronic gadgets.

There are numerous versions of these devices, but they generally seem to be variations on a theme, an alleged

discovery by one Royal Rife in the early 1930s. He claimed that each pathogen, be it viral, bacterial, toxic chemical or anything else that might cause illness, is subject to destruction by a specific electromagnetic frequency. That this idea is implausible seems obvious, but even were we to assume it to be true, there is no logical reason to suppose that *only* pathogens should be adversely affected by specific frequencies. Thus, in the interests of safety, it would be expected that the construction and operation of the powerful machines designed to generate these specific healing frequencies should be very carefully monitored to prevent the wrong frequencies causing damage to healthy organisms. This is not the case, as we will show later.

Further, it should be remembered that this claimed theory of biophysics was postulated before Chadwick had discovered the neutron, and appears not to have won other than fringe acceptance, while the study of physics, biology and electronics have undergone revolutionary discoveries and changes in the 70 years since it was first postulated.

One would expect that such revolutionary, but essentially simple, devices would by now be standard tools used by medical practitioners for the treatment of disease, but that is not the case. There are 'clinics' where people can be 'treated' with these devices, or they can be purchased so people can 'treat' themselves, but they have no support among the medical or scientific communities and there is no evidence that they can perform any useful healing function at all, let alone cure all known ailments.

The machines in question are often designated as "Rife" machines, "Hulda Clark" machines, (Dr Hulda Clark, the proponent of this version, was recently arrested in California for extradition to Illinois where she faces indictment for activities associated with the use of these devices.) "Zappers" and various other names. A related device, one that is claimed to produce "colloidal silver", is an equally suspect gadget, its efficacy allegedly based on the supposed bactericidal capabilities of that substance. (Concentrated H₂SO₄ is also an

effective bactericide, but we know of no one promoting its use in therapy - yet.)

They come in many guises, some, at the lower end of the price range, are single frequency devices, while the more expensive items, running into the hundreds and even thousands of dollars, have adjustable frequencies. They are often built by back-yard electronics enthusiasts, from plans sold by others. Items that have been tested by trained electronics people have often produced frequencies far different from what is advertised. They are usually advertised in those journals whose editorial contents are dedicated to conspiracy theories, or in publications advocating all manner of "alternative" (ie untested) therapies, usually carrying the editorial line "people must be allowed to make their own choices about their health care". A noble sentiment, but meaningless without the qualifier "informed". They are promoted, not with evidence of successful clinical trials, nor any of the other tests that might support their efficacy, and assist people in making an informed choice, but by personal testimonials and word-of-mouth. Given the sort of products they are and given the media in which they are advertised, it is hardly surprising that they are also supported editorially by all sorts of "suppression" conspiracy theories.

This is the area in which Cheryl decided to concentrate her efforts of exposing untested claims to critical analysis. The nature of her campaign is covered to some degree in a series of articles written by journalist Maureen FitzHenry, run earlier this year in the *Newcastle Herald* and summarised in *the Skeptic* (19:1 pp. 8-12) but it has generally been ignored by the rest of the media.

Cheryl's story is one of courage, determination and frustration, in the face of an almost universal lack of interest and bureaucratic buck-passing among the regulatory and consumer protection agencies of state and federal governments. Initially the task of regulating this sort of gadget came under the aegis of the (Federal) Therapeutic Goods Administration (TGA), however this body said that as the devices concerned were *not* therapeutic goods, their regulation fell outside the jurisdiction of TGA.

No doubt that is true, but that is not what the public has been led to believe. Changes in advertising standards for therapeutic devices was supposed to control the claims made for such gadgets, and while that might have had some effect on published advertisements, it did nothing to prevent the promoters from making all sorts of claims to individual purchasers, as Cheryl and others have found.

State authorities are no more willing to tackle this than are their Commonwealth counterparts. Complaints about these sort of devices forwarded to the NSW Health Care Commission are usually passed on to the Dept of Fair Trading (because they are not medical complaints) and Fair Trading seem to ignore them as well. It appears that it is all too difficult for the bureaucratic bodies set up to protect the citizens and it often seems that these bodies wish that Cheryl and other concerned people would just go away.

However, there just might be some light shining through. A federal government reallocation of jobs saw responsibility for investigating these products transferred to the Australian Competition and Consumer Commission (ACCC), which is at least trying to do something about the problem. A quotation from their web site will explain:

[ACCC] filed proceedings in the Federal Court against Colin Ronald Dixon, Vital Earth Company Pty Limited and its director Darryl John Jones and Raylight Pty Ltd and its director Herbert Nathan, alleging breaches of sections 52 and 53 of the Trade Practices Act 1974.

Raylight has marketed alternative therapy products including the 'Parasite Zapper' and the 'colloidal silver kit'. Advertisements published in *Nexus New Times*, a health magazine, claimed that the 'Parasite Zapper' passes an electric current through a person's blood and that this is effective in treating a number

of serious medical conditions including HIV, hepatitis and herpes as well as obesity. Raylight has also claimed that the colloidal silver kit is able to produce colloidal silver and that this is effective at killing intestinal bacteria and viruses. Vital Earth has marketed a number of products including the 'Vital Silver 3000 Zapper' and the 'Vital Silver 2000' which it represents as being able to create colloidal silver which it is claimed has been used successfully to treat a number of serious medical conditions including AIDS, leukaemia and cholera. Representations concerning products marketed by Vital Earth were posted on Internet sites operated by Colin Ronald Dixon. The ACCC is seeking refunds, injunctions and corrective advertisements.

Well that's a start and we commend the ACCC for the action it has taken, but who has heard about it? One would have thought that this was precisely the sort of story to capture the imagination of any investigative journalist worth his or her salt, but to our knowledge nothing at all has appeared in the media about it.

This is a big and diverse industry, with lots of players and there is a lot of money being made from a lot of vulnerable people. If the media (isn't that supposed to be a contraction of *news media*?) spent a little less time and space on navel gazing about the ethics within their own profession, or the latest cock-up in the Olympic preparations, and did a little investigation, there is a big story to be told.

Unfortunately, both the regulatory authorities and the media seem only to be interested if they can be presented with complaints from victims of these things, and neither group seems to be interested in doing any sort of investigations on their own behalf. Do we have traffic regulations in this country only because people have complained about being run down by cars? Do people have to die from lack of proper medical treatment because they have fallen victim to plausible sounding sales pitches? If so, how many need to die before someone in authority will take responsibility - will show that they care?

Cheryl has done everything she can to expose this dangerous trade, though her resources are limited and her health is not robust. But Nurse Cheryl cares and for this reason we are very pleased to award her the accolade of Australian Skeptic of the Year for 1999.



Peter Goldsworthy, Michelle Foster, Allan Lang and Barry Williams after the Bent Spoon announcement.



Jacques Derrida at Monash

Mark Newbrook

The 'big guru' of French postmodernism spoke for about three hours to a large audience about forgiveness, and in particular about whether there are deeds it is not possible to forgive, such as the carrying out of the Nazi Holocaust. Jane Curtain and I attended for the first 100 minutes until we had to leave for another commitment. My comments below are based almost entirely on what we ourselves heard; but, from what we have been told, Derrida did not say anything later that would make it likely that I would revise my main judgments.

Reactions to the talk were mixed, but in my own view Derrida said remarkably little that had any substance, still less contributed to our understanding of such matters. Jane Curtain suggests that many were taken in by Derrida's reputation and assumed that behind all the surface obscurity the ideas of such a master must be truly profound, perhaps too profound for the average listener (even a scholarly listener) to grasp. I am inclined to agree; and this assumption was certainly apparent from the tone of some of the subsequent press reporting. However, few of those who reported themselves well satisfied were able to specify what, exactly, they had learned or gained.

As is not unusual in his tradition, Derrida's approach to the issue of forgiveness included a considerable focus on the etymology of the word *forgive* and that of equivalent words in other languages. Mainstream linguists have long argued that such considerations are not normally relevant to the thinking or practice of ordinary users of languages, untutored in historical linguistics. And - again not uncharacteristically - much of Derrida's discussion consisted of undisciplined analysis of the sense of words such as *forgive*, and of the development of *a priori* accounts of what Derrida takes to be the mental aspects of the process of forgiveness and the states of having forgiven or having been forgiven. Most of the relevant scholars outside the postmodernist camp - linguists, philosophers of language and (most of all) philosophers of mind and empirical psychologists - would rightly view all this as, at best, highly tentative speculation (naturally **not** acknowledged as such by Derrida).

Indeed, while Derrida is identified as a philosopher, what he practises is not really what is called *philosophy* in the analytical-philosophical tradition, which is the form of philosophy occupying a central place in the 'modernist' post-Enlightenment 'paradigm' of intellectual activity. The European existentialist tradition has included much *a priori* speculation (as opposed to the careful analysis of problems) concerning language and more particularly concerning the mind, occupying a much more central place in the overall scheme of things than mainstream analytical philosophers would deem legitimate; and, as noted, Derrida and his followers have continued in this vein. Derrida's material was also char-

acterised by other common features of postmodernist work:

- a) the over-analysis of concepts;
- b) what appeared at times to be almost deliberate obfuscation; and
- c) the simultaneous assertion of paradoxically opposed statements.

By way of a further paradox, this last is sometimes interpreted by perplexed commentators as somehow conferring additional depth and significance on the obscure propositions which are thus expressed; this almost certainly contributed to some of the positive reactions referred to above. (The relativism which often intrudes - predictably - into postmodernist thinking did not loom particularly large in the context of this specific issue.)

What is especially unfortunate here is that Derrida missed the opportunity to discuss (in a coherent and disciplined way) several very interesting philosophical and linguistic points surrounding the exact sense and implications of the word *forgive* and the notion of forgiveness. Some of these he did discuss but not in a satisfactory way, others he merely hinted at, others he ignored. They include:

- a) Can one (legitimately) forgive someone who does not seek forgiveness, or maybe even thinks that what one might forgive them for was not wrong and requires no forgiveness?
- b) Can one forgive someone on behalf of a 'group' or 'community' to which one (purportedly) belongs? (Despite Derrida's apparent equation of commonality or group/community membership on the one hand and mere plurality on the other, they are **not** the same thing; his linguistic points on this front - chiefly based on the existence in most languages of separate singular and plural personal pronouns - were naïve and unpersuasive.)
- c) Can one forgive someone on behalf of others who do not consent to forgive them?
- d) Can one forgive someone on behalf of others who cannot consent to forgive them (eg, the dead)?
- e) Can one forgive those who do not or cannot know what one is (purportedly) doing?
- f) A very important special case of e): can one forgive the dead?
- g) Are there deeds which are unforgivable? What exactly distinguishes such deeds?
- h) How can blame and hence the possibility of forgiveness be divided up in cases like the Holocaust where those who physically perpetrated the individual wrongs were not those who instigated them?

The domains and statuses of some of these questions

Continued p 14 ...

Anti-immunisation meeting

Susan Cluett

In October, Australian Skeptics heard about a meeting to be held in the Sutherland Trade Union Club, sponsored by the Australian Vaccination Network, a body noted for its opposition to vaccination. Our information came from Assoc Prof Simon Chapman at the Dept of Public Health and Community Medicine, University of Sydney. As time was short, we emailed subscribers who lived in the area and a number of medical practitioners whose email addresses we had, advising them of the meeting and asking them to attend the meeting and to ask the sort of questions that might elicit responsible replies. Several of them attended the meeting, as did Prof Chapman with some of his students. Among those attending was Susan Cluett and her report follows.

As an undergraduate psychology student and a parent I thought it would be fun to go to the Anti-immunisation meeting at the Sutherland District Trade Union Club on Tuesday night and support the Skeptics. I thought it would be an interesting exercise for me to scrutinise whatever statistics/graphs and research studies the speakers may quote. With me was my husband Malcolm and four year old daughter Kirsten. The speakers, organised by the Australian Vaccination Network, were Dr Viera Scheibner, Dr Mark Donohue, Dr Archie Kalokerinos, Marelle Burnum Burnum and assorted advocates of naturopathy. A number of (their own) publications were for sale.

I hope a layman's view is helpful. Here's the rundown:

We were expecting to hear a fair load of nonsense. Well, it wasn't just bad, it was appalling. Firstly, they had a copy of a Skeptics'* email inviting subscribers to attend. They claimed they had intended a balanced debate but the 12 pro-immunisation invitees they had contacted (a journalist and many notable people from the AMA and various hospitals) had been unable to attend or hadn't replied. I wonder how much notice they gave these extremely busy people and how hard they tried to find substitutes. "We have done everything possible to have a balanced evening"! Well they didn't, because, knowing that Skeptics would be present, the question time at the end of the talk was not to be an open forum but questions were to be written down and handed in. A very effective way of censoring any opposing views. They knew they would not be made to justify their claims, so as the night wore on these claims became more and more ridiculous and outrageous.

The first speaker Dr Mark Donohue was a GP who chose not to vaccinate his own children, and quoted (not realising the irony of his own words) "experts are right only in their narrow field of expertise" and "you can fool people who are not educated". Conveniently for him, so true for many of the unfortunate audience. Thus began the first of the conspiracy theories to be

espoused by all speakers, and set the tone of evening with a "don't trust doctors / anyone in authority" theme. Among his unsubstantiated claims were "doctors cannot be neutral, they are paternalistic, biased, do not report adverse reactions and promote Government procedures", "vaccine manufacturers need to make a profit out of third-world countries", "anti-vaccination people were better educated, are more healthy and use doctors less often" (his own observations). If they are, they are probably that way because the rest of us are vaccinated. He then went on to blame hospitals for measles and pertussis outbreaks claiming the cause was adults who were vaccinated as children (where is the evidence?) He claimed that huge numbers of adverse reactions were not reported by doctors. Not once did he actually describe and specifically define adverse reactions to any vaccines. As a doctor this is certainly within his capability. This would be a main issue on which many parents would be seeking information and clarification. I wondered if parents observing the *normal* reactions to a vaccine would mistake these symptoms for an adverse reaction. I suspect the so-called adverse reactions were within the range of normal. (The issue of reactions crops up later in Dr Schiebner's use of her own device used to monitor babies' breathing).

Dr Donohue admitted with a sneer that his only attempt at publication in an AMA peer reviewed journal was promptly rejected.

As with the first speaker, the next speaker, Dr Archie Kalokerinos quoted his own experience, ignored anything that happened after the 1970s, and presented no evidence to back his claims that: a large number of soldiers died from tetanus vaccines during WWII; vaccination schemes in Nigeria were responsible for the spread of HIV / AIDS and was a deliberate policy of genocide; large numbers of aborigines given flu vaccines in the 70s died of heart attacks as a result, (with criticisms against a former colleague); and - here comes the conspiracy theory again - that the US government systematically planned to get rid of undesirable types (criminals etc) by encouraging people with known heart problems to be vaccinated. To finish, Dr Kalokerinos' triumphant advice was that large intravenous doses of vitamin C will ensure our protection against disease. I contemplated the glass of orange juice in front of me, marvelling at the possibilities. Nevertheless, no scientific evidence was given to support any of the above claims.

The point that Dr Kalokerinos made about reusable syringes was valid, but is not a risk directly attributable to vaccination (ie, a red herring). He made a point of showing an image from a 1970s edition of *Scientific American*, depicting an African man being vaccinated with a non-disposable syringe. At that time, disposable syringes would still have been relatively uncommon

(especially in developing countries). It is scaremongering to talk about the risk of reusable syringes in Australia in the 1990s.


Dr Scheibner was next, obviously encouraged by the lack of opposition to any of the aforementioned. We were bombarded with more conspiracy theories, comparisons of stress in babies to stress in animals, a series of meaningless and statistically invalid graphs of babies' stress levels/breathing patterns etc, courtesy of some machine her husband designed. Did I hear correctly? I couldn't believe her graph of the stress levels of a child (yes, one (1) only - compared with what? Not 500 vaccinated compared to 500 non-vaccinated babies or anything like that, but one baby - data gathered by its mother). Sure, any old graph with interesting bits going up and down in the right places is sure to impress them. She then showed similar graphs comparing two different children and admitted "there are individual differences". She then complained about lack of time to present any further 'studies' and proceeded to go over the allotted time anyway to spout forth with her theories of the "causal link between cot-death and vaccination". Her graphs showed 'evidence' of shock reaction and delayed reactions in babies, backed up with overhead projections of press clippings. Dr Scheibner, on a roll, informs us that Shaken Baby Syndrome is false, that these deaths are really due to immunisation and our jails are full of innocent people!

This revelation can only be eclipsed by that of the next speaker, Marell Burnum Burnum. Immunisation causes autism!!

With the usual dreary personal anecdotes and absence of evidence she helpfully revealed to us the cause of her "success rate with pertussis". (This success story consists of two pertussis patients with a residual cough who had already been treated with antibiotics by a doctor). Ms Burnum Burnum admitted that "delayed reactions make it difficult to show any links to vaccination"! Pardon me, but what links were there in the first place? Nevertheless she proceeded to drift off into feel-good fairyland as she described her herbal remedies. To prevent disease all we need do is build up our immunity with vitamins, improve our diet, have faith, hope and spirituality as our emotions affect our immunity. It must work because her son never gets sick. So there you have it. We were then ordered to stand up and have some stretching exercises. I wished they would hurry up and start collecting the questions from the audience, although I knew where mine would end up.

I was surprised to discover that the next speaker was a woman I knew from my local playgroup. She complained that her rubella vaccination in the 70s did not work. Actually, the same thing happened to me. I did not discover until my pregnancy that my immunity was low. I had to then be careful and was promptly given a successful booster immediately following the birth of my daughter. Immune levels can be checked via a simple blood test. Apparently the airgun used for rubella vaccinations back then was discontinued not long after. By now we had had enough of all this rubbish and decided to leave. I would be interested to hear if any other Skeptics were there, and what happened during question time.

I wondered how many well intentioned parents would mistakenly feel confident about failing to immunise their children. I felt sad that the health of innocent children was at risk, especially those too young to be immunised. The anti-immunisation lobby really push the idea of freedom of choice, 'empowerment' etc also used to advantage by the tobacco lobby. The idea of going against a doctor's advice, feeling good about it and getting support for it may appeal to lots of women. The AVN know this, and use it to their advantage. "Educate before you vaccinate" - if only they could take their own advice. The list of 'facts' and graphs they gave out was dubious.


Another thing that surprised me about the meeting was the huge turnout. My husband and I are members of a number of organisations that struggle to get enough members to form a quorum at meetings. Yet here were perhaps two-hundred people who willingly left home and paid \$7.50 each to hear the anti-vaccination message. Perhaps the meeting was publicised through health-food shops and naturopaths. We live locally and didn't hear about the meeting or see any notice in the local newspaper. 

.... Derrida from p 12

(linguistic? philosophical? psychological?) might itself be a focus of discussion. Some of them may be variously interpreted as belonging to a range of such domains, and in some such cases ambiguity and hence confusion may be possible.

Derrida contributed almost nothing to the resolution of any of these issues. The points of this kind which he did make were for the most platitudinous and low-level, eg, dealing in general terms with the question of the link between forgiveness and the claimed right (legal or moral) to punish. Even here his discussion was not especially coherent, and (again typically) he made unsupported claims about ethical theory which are by no means axiomatically or obviously true.

While I acknowledge that postmodernist thinking has raised or at least highlighted some neglected and important points about language and the world, this event further confirmed my generally negative view of the overall effects of the postmodernist tradition. It is striking that Derrida was here on part of the postmodernists' 'home ground', the study of literature and what passes in postmodernist circles for philosophy. As Sokal and others have shown, these thinkers rapidly get out of their depth when they venture into other fields, especially science; but this kind of performance suggests that their reputation within their 'own' domains is itself seriously overblown.

Derrida may not be the worst offender in this respect; that 'distinction' should perhaps go to Julia Kristeva, who has (alarmingly for this writer) identified as a linguist (I challenge anyone to summarise three pages of Kristeva intelligibly). But on this occasion he was certainly bad enough. We (especially those of us with any expertise in the relevant disciplines) should keep our eyes open and our weapons in readiness! 

Breatharians found guilty

Barry Williams

The “breatharian” movement, based on the notion that one can live without food or drink and survive on some sort of postulated cosmic or “pranic” energy, has attracted a deal of notoriety of late. Some recent developments should ensure that it disappears without trace and without regret.

Breatharianism, long regarded by Skeptics as one of the more risible of all new age notions, most recently came to serious attention around mid-year, when an Australian devotee, living in Scotland, died of starvation while trying to adhere to the practices of the movement. She was not the first to suffer because of this dangerous delusion, but her story did receive considerable media notice and may have contributed to what followed. Suddenly this notion seemed a lot less funny.

The chief promoter of breatharianism in Australia is a Brisbane based woman going under the name of Jasmuheen. She had come to the attention of the British media earlier this year, when, after her visit to that country, a journalist accompanied her to Heathrow, where it was revealed that she had ordered a vegetarian meal for her flight. Her claim that she had ordered it, but she didn’t intend to eat it, caused a great deal of sceptical hilarity in the UK media. Jasmuheen sought to counter this image by plastering her web site with an extremely long-winded discourse, in which she claimed (in abbreviated form) that breatharians never claimed that they do not eat, merely that they could live without food. Some ate food to enjoy the taste and others liked to share a meal with family or friends, even “a chocolate biscuit or a packet of chips once a week or once a month”.

Back in Australia, she approached the Queensland Skeptics seeking to be tested for our \$100,000 challenge. Our colleagues entered into discussions with her regarding the methodology of any such test, but this soon degenerated as Jasmuheen tried to take charge of the testing procedure. She wanted to do it her way, but that is not how the challenge operates. The claimant states her claim and a test is devised that will either validate that claim or refute it. The claimant is asked to agree or disagree that it is a fair test and adjustments may be made. It is never the case that the claimants design their own tests (for obvious reasons). We have to be alert to the fact that any such claimant might be so self-deluded that they will agree to anything, and we are also constrained to always use ethical testing procedures that will cause no harm to a claimant’s health.

However, matters were taken out of our hands when the *60 Minutes* programme (Ch9) found Jasmuheen willing to undergo testing in the full glare of publicity. She was installed in a Brisbane hotel, with a 24-hour-a-day guard and not allowed to take any nourishment apart from what came from the air or light (which is the basis of her claims). Her health was monitored by a

medical practitioner (the President of the Qld AMA). After two days, when signs of ill-effects were already becoming apparent, she complained that the ambience of the hotel was having a bad effect, and she was then moved to another location, which she proclaimed as being more appropriate. After a further two days, when it was obvious that she was in bodily and mental distress, the doctor advised the programme to halt the test, at the risk of causing Jasmuheen serious physical damage if it continued. So the myth of living on light was exposed for the sham it is.

But if Jasmuheen suffered no more than temporary discomfort from this test, one of the unfortunate folk who followed her ridiculous teachings was not nearly so lucky.

In June 1998, Lani Morris, a 53 year-old woman from Victoria, became convinced that her problems could be solved by her initiation into breatharian techniques and placed herself in the hands of breatharians, Jim and Eugenia Pesnak. She visited them in Brisbane and was placed in a caravan in their back yard, where she was given no food nor liquids and left to her own devices. On July 1, she died in hospital, having been transferred there suffering from a severe stroke, serious dehydration, kidney failure and pneumonia. The Pesnaks were charged and on November 19, 1999, they were found guilty of manslaughter. Jim Pesnak received a sentence of six years and his wife three.

In mitigation of their offence, the Pesnaks claimed they “honestly and reasonably believed” that she was not sick until 11 days into the process. As we have often said, sincerity is an admirable personality trait, but where your sincerely held beliefs put another person’s life at peril, sincerity is not enough. In this context, we can only question how sincerely anyone can hold a belief that they are living on cosmic energy, when they must actually be eating and drinking. How can anyone be so self-deluded as to deny the evidence of their own actions?

In her article elsewhere in this issue, Rosemary Sceats, gives a history of the religious antecedents of the “breatharian” beliefs.



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Aliens on our doorstep?

Some thoughts about the UFO phenomenon

Paul Davies

Text of the address given by Paul Davies at the Australian Skeptics annual conference, Adelaide, November 6-7, 1999.

Once upon a time the prophet Ezekiel was going for a walk by the river, when out of the corner of his eye he noticed a flash of light and four strange objects in the sky. They looked like flying wheels, full of eyes, that turned as they went. They glowed with a metallic colour. Soon the objects came down to the ground, and out of each stepped the likeness of a man. There followed a brief theological discourse, after which the visitors departed with a rumbling sound and poor old Ezekiel was left, to use his own words, "overwhelmed".

That was twenty-three centuries ago, and people have been seeing weird things in the sky ever since. Today there are reports of UFOs, flying saucers and alien abductions. Books like Erich von Daniken's *Chariots of the Gods?* and television series like the *X Files* have created a climate of credulity in which a large fraction of the community believes that aliens are real, and that they have visited, and may still be visiting, the Earth.

The big question

The problem of whether or not we are alone in the universe is one of the biggest of the big questions of existence. The search for life beyond the Earth is, in a sense, a search for ourselves - who we are and what our place might be in the great cosmic scheme of things. It goes beyond mere science, touching on issues such as our stewardship of planet Earth, the future of religion and the very nature of the universe we inhabit.

I want to state right at the outset that I don't know whether we are alone in the universe. I think the jury is still out on the matter. But there is no denying the interest among the public in the possibility of alien life. Remember how the world was electrified when President Bill Clinton stood on the White House lawn and announced that the US Space Agency NASA had evidence for life on Mars. The fuss concerned some microscopic features in a martian meteorite found in Antarctica that might just be fossil bacteria. Not much to look at compared to the little green men of martian lore, but tantalising nevertheless.

Last month I visited Jill Tarter of the SETI Institute in California. Jill was recently immortalised by Jodie Foster in the Hollywood blockbuster *Contact*, written by Carl Sagan. Sagan's character of Ellie Arroway, played by Foster, is based on the said Jill Tarter. SETI stands for "Search for Extraterrestrial Intelligence," and you will hear all about it in Carol Oliver's lecture after mine. This project sets its sights higher than finding microbes on Mars. SETI researchers want to make contact with entire alien civilizations. To do this they scan the skies with radio telescopes in the hope of stumbling across an alien message.

Amazingly, large radio telescopes like the one at Parkes in New South Wales have the capability of detecting a beamed radio signal from the other side of the galaxy, many thousands of light years away. The problem is, there are billions of stars in the galaxy, and billions of potential radio channels. Even if there are alien signals coming our way, how do we identify the source star system and know which waveband to tune into? It's a needle-in-a-haystack problem with a vengeance.

SETI scientists have developed some nifty technology to tackle the latter problem. It's a multi-channel analyser that can sift millions of radio channels simultaneously. One of these devices, costing a modest \$40,000, is currently bolted onto the Parkes radio telescope, so as the astronomers go about their routine work surveying the heavens, this passive device keeps a permanent ear out, so to speak, for any hint of artificiality mixed in with the natural radio clutter from space. As far as I know, nothing has been found, but Carol is looking rather smug, so we shall see. If ever ET calls, I can't think of a better forum to announce the event than a Skeptics conference.

Fermi's paradox

The point I want to make is this. If intelligent life is widespread in the cosmos, as many people suppose, then we have less, not more, reason to give credence to the UFO stories. Why is this? Surely if the galaxy swarms with alien civilizations, we should expect to see some physical trace of it? Indeed, the famous physicist Enrico Fermi once used this as an argument against the existence of aliens - if they are out there, he said, they should have visited us by now.

Fermi's reasoning is based on simple statistics. The Earth is 4.5 billion years old. There has been life here for nearly 4 billion years - it has taken that long to evolve to the point where we are capable of limited space flight and interstellar radio communication. Suppose another planet somewhere in the galaxy formed at exactly the same moment as Earth, which is already improbable. Then the chances of biological evolution on that planet paralleling terrestrial evolution so closely that intelligence emerges after 4.5 billion years is infinitesimal. So much of our evolutionary history depends on happenstance. For example, were it not for the fact that a giant asteroid slammed into Earth 65 million years ago and destroyed the dinosaurs, mammals like us might never have reached ascendancy.

Now take into account the fact that the galaxy is probably 12 or even 15 billion years old, and you see that there were stars and presumably planets that were vastly old before the Earth even existed. So the probability of two planets in the galaxy harbouring life forms at the same level of evolutionary development at the same time is negligible. The conclusion must be that if

there is life beyond Earth - and it is still a very big if - then any intelligent life would either be way, way ahead of us, or way behind. If it is way behind, we won't know they are out there. But what if there are many alien civilizations that are way ahead? Wouldn't we expect them to visit us? That was what Fermi believed, and he used their absence as evidence for their non-existence.

But I think there is a flaw in Fermi's argument. It is this. If there are many alien communities, there is little reason for them to journey between the stars in the flesh. Why bother, when you can simply call up your friendly alien neighbours next door and get them to up-load their latest video onto the galactic internet?

Interstellar travel is extremely expensive, both financially and ecologically. The problem is the tyranny of distance. Outer space is hugely, unimaginably vast. The nearest star to the sun is over four light years away. To go star-hopping Trekkie-style you need to go very, very fast, or you would be dead long before you arrived. Since the laws of physics forbid travel faster than light, the best one can hope for is to get close to the speed of light. It would then take a few years to go from one star system to another.

But reaching near-light speeds carries a colossal energy cost. To give you some idea, to accelerate a spacecraft to 90 per cent of the speed of light would consume about a billion times as much as sending it to the moon. Contrast this with the amazing fact that the total energy ever collected by all the world's radio telescopes from all sources in the sky amounts to less than that needed for a fly to crawl one centimetre up a wall! Photons are squillions of times cheaper to send than great chunks of metal, or flesh and blood. So if they are really are there, good! We don't need to travel the galaxy after all, because intelligent beings are already there and can tell us what we want to know. By the same reasoning, the aliens would be unlikely to develop interstellar flight either, so there is no reason to expect them to visit Earth.

Wormholes

I concede that there is a small loophole in my argument. One is that it maybe possible to break the light barrier with exotic space-warping technology. For example, Jodie Foster gets dropped into a sort of gigantic kitchen mixer in Japan and emerges a few minutes later at the centre of the galaxy. Pretty neat! The trick she uses is known in the trade as a wormhole, and I have actually worked on the idea as part of my research in mathematical physics.

A wormhole is a bit like a black hole, only different. Whereas falling into a black hole is a one-way journey

to nowhere, a wormhole has two ends. The idea is that they link two points in space that would otherwise be far apart in such a way as to provide a short-cut. You can study all this using mathematics. It may be possible, but you have to reconfigure the universe to make the wormhole. So in other words, you have to be out

there already in order to manufacture the wormhole that will shorten the journey. Maybe there are civilizations with galactic capability like that, but we have no evidence for it. Besides, a wormhole is also a time machine, allowing travel into the past. That opens up a Pandora's box of causal paradoxes, as devotees of *Dr Who* and *Back to the Future* are well aware.

Let me summarise my argument so far. We don't know whether life is unique to Earth, or whether the universe is seething with it, because we have scant idea how life began. Even if life is common, we have no real way of knowing how likely it is to evolve intelligence, let alone technology. But if it does, then these ubiquitous technological communities will surely make contact with each other and exchange information, before dashing off across the galaxy



Paul Davies addresses the annual conference

in spacecraft.

Hence I am a strong supporter of SETI, even if the chances of our ever picking up a signal from an alien civilisation must be considered slim in the extreme. It's a wonderful, uplifting project! The way the arithmetic works, then, is either that we are alone, in which case there is nobody out there to visit us, or civilizations are common, in which case they wouldn't bother. Either way, we would not expect visitors. The only circumstances under which a visit would be plausible would be if we shared the galaxy with, say, one or two other civilizations, and they regard us as so rare and precious that they dare not rely on using radio in case we don't tune in. So they come in person, to be sure. But now we run into the speed of light problem once more. Our first radio signals have travelled only a few tens of light years into space. The galaxy is a million light years across. The chances of one of these two or three civilizations being so close to Earth are infinitesimal. Even if they could peer at us by magic and see the first faltering steps of human civilization eight thousand years ago, they would still have to be situated within a mere four thousand light years to have got here by now. I'm afraid whichever way you look at it, the probability is extremely small that the Earth is being visited by aliens at this time.

Aliens just like us?

So what, then, gives rise to these extraordinary UFO and alien abduction stories? First, there won't be any

simple catch-all explanation. UFO reports range from vague lights in the sky, through classic Ezekial-type flying saucers, to big-eyed grey dwarfs standing at the end of the bed. There must be many different phenomena behind in all these stories. Let me concentrate on so-called close encounters of the third kind. A classic case in the UFO literature is the so-called Roswell incident, involving the alleged crash of a flying saucer in New Mexico in 1948, following which the US Military were supposedly engaged in a massive cover-up. A few years ago, Roswell Ufologists were elated when some sensational movie film came to light of autopsies apparently being performed on the alien occupants of the crashed flying saucer. This film was widely shown on TV. For me, it was the best evidence yet that the Roswell object was not an alien spacecraft. The bodies being cut up in the film are not pretty, but they are undeniably human in form. They have arms and legs, two eyes, a nose and a mouth, and all the other anatomical paraphernalia. So why couldn't they be aliens? I come back to my evolutionary argument. What are the chances of alien life paralleling terrestrial evolution so closely that it throws up intelligent beings not only at this time, but also with a physical form that makes them look just like us? Effectively zero. On the other hand, the bodies in the autopsy film do look just like something straight out of Hollywood central casting. The same goes for the saucer technology. The UFO reports don't suggest a ten-million year technology, they look like the next generation of stealth bombers. After all, at Roswell, the damn thing was supposed to have crashed! Can you imagine travelling ten thousand light years across the galaxy in a miracle of engineering, only to cock up the landing and pile into the desert sand! I'm afraid the incident at Roswell has an all-too-human feel to it.

Lucid dreaming

Passing on now to the most mind-boggling reports of all, close encounters of the third kind, what are we to make of the extraordinary alien abduction stories? I believe that at least some of these accounts are due to a phenomenon known as lucid dreaming. Normally dreams are a vague and jumbled amalgam of the trivial and the bizarre, a pale shadow of waking reality. Occasionally however, a subject may have a so-called lucid dream. The contrast is dramatic. During lucid dreaming images are sharp and well-defined, colours vivid and tactile senses strong. The dream world appears orderly and rational. Lucid dreaming is often described as like being awake in a dream. Its onset is marked by a sudden transition to clarity.

One lucid dreamer described how, with the realiza-

tion he was dreaming, "instantly the vividness increased a hundredfold... never had sea and sky and trees shone with such glamorous beauty; even the commonplace houses seemed alive and mystically beautiful". Experiences can vary from the ecstatic to the terrifying. Sometimes habitual lucid dreamers, known in the trade as oneironauts, have a measure of control over events, enabling them to act out their fantasies, such as flying like Superman. In fact, levitation is a recurring theme of lucid dreaming. On other occasions the subjects are seized by paralysis and feel helpless and vulnerable in the face of dark threats.

Most people experience involuntary lucid dreaming at some stage in their lives. In my own case, I occasionally dream lucidly just before dawn. It usually takes the form of hearing voices very clearly, so clearly that I am convinced there are other people talking nearby. The aural phenomenon is accompanied by a very acute tactile sense, and I often feel myself being touched, very distinctly. Sometimes these physical sensations cause extreme pain. Usually I am partially or totally paralysed, and mostly my response is to struggle very hard to get out of bed. I am unable to tell whether I am really inching my way out of bed or just dreaming it, because the bedroom looks so vivid and normal.

Because lucid dreams appear so real, it is quite possible for someone to remember one, especially if it is of a dramatic or frightening nature, as a real experience, and re-

port it as such. It seems likely that many religious experiences originate in this way. Traditional reports of visions, or of being visited in a dream, or of levitating during intense meditation or prayer, carry all the hallmarks of lucid dreams. These days not many people seem to be visited by angels, but there are many reports of visitations - and even abductions - by aliens.

The religious dimension

As in traditional religious experiences, alien encounters are often accompanied by a sense of momentous import and a feeling of paralysis or helplessness, and levitation. Again, reports vary from the ecstatic and revelatory to the terrifying. There are persistent descriptions of physical abuse - prods and probings - often of a sexual nature. My own experiences of paralysis, of other people being close by, and of keenly felt prods fit the bill exactly. Again, historical records suggest that such experiences are not new. In the Middle Ages, there was widespread belief in succubi and incubi - demons who, respectively, visited men and women in the night to seduce them or to subject them to sexual ordeals. Folklore about vampires is also replete with imagery of night-time physical and sexual abuse.



Cosmic conversation over a cuppa.

Belief in alien visitation is widespread. Some surveys report that no less than 3 million Americans claim to have been physically abducted by aliens. Three million! I'm starting to feel left out. Millions more people around the world both hope and believe that aliens are watching us. Why is there this extraordinary willingness to believe such an incredible hypothesis? I should like to suggest that belief in aliens on our celestial doorstep is akin to a form of religion. UFO reports are replete with religious imagery.

One of the earliest and most famous close encounters of the third kind happened in 1952 in California - where else? The subject was one George Adamski, a hamburger vendor from Palomar. Adamski claimed he met a Venusian in the Mojave desert, and he published a book, *Flying Saucers Have Landed*, complete with photographs of a lamp shade said to be the Venusian's flying saucer. The friendly alien was described as six foot tall, of peaceful, indeed saintly demeanour, and resplendent with long blond hair. The resemblance to Hollywood's image of Jesus is barely concealed.

The association of the sky with heaven, or the realm of the gods, is deep-rooted in our culture, so it's no surprise that anything mysterious in the sky, or from the sky, is laden with religious significance. In the bible, angels were the messengers of God, that is, superhuman intermediaries that can act as a conduit between mortals and the divine. It is a theme that was brilliantly, if superficially, exploited by Erich von Daniken in his famous best-seller *Chariots of the Gods*. According to von Daniken, Earth has been continually visited throughout human history, and ancient stories of gods and angels can be explained as sightings of alien humanoids going about their business.

On a more profound level intellectually, the books of C.S. Lewis seek to explore human spirituality in the setting of extraterrestrial life. In *Out of the Silent Planet* and *Perelandra*, the intrepid Dr Elwin Ransom does battle with the forces of evil around the solar system. It's a theme very familiar to *Star Trek* fans. Similarly, David Lindsay's atmospheric and offbeat novel *Voyage to Arcturus* begins with a seance and develops into a spiritual quest on a far-flung planet populated by strange but knowing creatures with a well-developed if idiosyncratic sense of good and bad.

Running like a thread through all these themes is the suggestion that the aliens possess arcane and perhaps mystical knowledge as yet only glimpsed by mere mortals, and that by communing with these otherworldly creatures we might gain insights into the meaning of life and the secrets of the cosmos. This quasi-theological slant persist even in recent books like Carl Sagan's *Contact*, where Ellie Arroway travels across the galaxy to meet with an angel-like being who appears in the guise of her dead father. The angel explains many of the profound mysteries of existence, but is coy about the answer as to who, or what, created the universe.

So again, the angel in the sky is a sort of halfway house to the ultimate reality. In the movie *Close Encounters of the Third Kind*, the alien spaceship - the mother of all spacecraft - puts in an appearance at the end. Anyone who has read Bunyon's *The Pilgrim's Progress* will immediately recognize in this giant spaceship the im-

agery of the Celestial City, it's thrusting towers aglow and beckoning. They will also recognize the struggle of the hero and heroine to reach the craft and mankind's encounter with destiny as a classic pilgrimage story, a journey beset by dangers and doubt.

Anyone doubting the religious dimension of Ufology need look no further than the tragic mass suicide of members of the Heaven's Gate cult three years ago, as they prepared to be transported to paradise by a flying saucer following comet Hale-Bopp.

The scientific view

Of course, none of this means that there are no alien beings out there, or that we cannot study the possibility of extraterrestrial life from a sober, scientific viewpoint. I repeat my strong support for the SETI project. It is possible that some of the scientists are motivated by quasi-religious feelings, maybe subconsciously. But it doesn't matter. Why doesn't it matter? Because science possesses inbuilt mechanisms to neutralise such biases. Science works, in spite of the beliefs of its practitioners, because it demands uncompromising standards of rigor and testability. The essence of science is that you try to prove theories wrong.

When NASA scientists claim to have found traces of life in an Antarctic meteorite, the scientific community immediately set out to shoot the claim down. It doesn't matter whether the NASA scientists believe or don't believe in microbial martians. They would be the first to applaud the strenuous efforts by their colleagues to prove them wrong. That is the way science works - in a spirit of scepticism and attempted falsification. Every new theory or claim must be battle tested against a sceptical scientific community. And if that theory or claims survives this hostile attention, well, so much the better for the theory. We should be more inclined to give it credence.

By contrast, most (not all) Ufology is not science but pseudoscience. You can't prove a convinced saucerer wrong, because it is one of the founding tenets of Ufology that there is a conspiracy. Governments and scientists are apparently involved in a massive cover-up; just watch the *X Files*. So if a scientist gives good reason why a flying disc was really a weather balloon or experimental aircraft, well, then the scientist is part of the conspiracy too. The point about conspiracy theories is that they are deeply unscientific because you can never disprove them. A theory that can't be disproved is a worthless theory.

I leave you with this thought. Giordano Bruno was burned at the stake in 1600 for the heresy of claiming that there are other inhabited worlds. Europe was at that time emerging from a period of Medieval ignorance and intolerance towards a scientifically-led Enlightenment. The stifling power of the conservative Church sought to suppress the new knowledge and turn back the clock. It failed. Today the Church has given up the struggle, but the forces of reliable knowledge and rationality face a new threat, a threat not from religion, but pseudo-religion, an *X Files*-led resurgence of dotty beliefs and intolerant cults. Unless we are vigilant, our society is in grave danger of sliding back into a new Dark Age of ignorance and superstition, even as we enter the new millennium.



Y2K – Is it too late to panic?

Beter Bowditch

In a fabulous book called *Extraordinary Popular Delusions and the Madness of Crowds*, published in 1841, Charles Mackay told us about panics and hysterias of the past. Updating the book to today would just require the addition of a chapter on the Internet stock craze, an update to the witchcraft chapter to include mention of recovered memory syndrome, satanic ritual abuse and alien abductions, and a new chapter about millennial madness.

Talking of the first crusade, Mackay said:

A strange idea had taken possession of the popular mind at the close of the tenth and commencement of the eleventh century. It was universally believed that the end of the world was at hand; that the thousand years of the Apocalypse were near completion, and that Jesus Christ would descend upon Jerusalem to judge mankind. All Christendom was in commotion. A panic terror seized upon the weak, the credulous, and the guilty, who in those days formed more than nineteen-twentieths of the population.

Half a millennium later, not much had changed.

A singular instance of the faith in predictions occurred in London in the year 1524. The city swarmed at that time with fortune-tellers and astrologers, who were consulted daily by people of every class in society on the streets of futurity. As early as the month of June 1523, several of them concurred in predicting that, on the 1st day of February 1524, the waters of the Thames would swell to such a height as to overflow the whole city of London, and wash away ten thousand houses. The prophecy met implicit belief.

It was reiterated with the utmost confidence month after month, until so much alarm was excited that many families packed up their goods, and removed into Kent and Essex. As the time drew nigh, the number of these emigrants increased. In January, droves of workmen might be seen, followed by their wives and children, trudging on foot to the villages within fifteen or twenty miles, to await the catastrophe. ... Bolton, the prior of St Bartholomew's was so alarmed, that he erected, at a very great expense, a sort of fortress at Harrow-on-the-Hill, which he stocked with provisions for two months. ... many wealthy citizens prayed to share his retreat; but the prior, with a prudent forethought, admitted only his personal friends, and those who brought stores of eatables for the blockade.

There are two sets of possible Y2K problems. The first of these is to do with the times themselves, as the predictions in Revelation and the works of Nostradamus and other seers come into effect. It is The Millennium with capital letters. It is the end of time and the start of new time. Societies, communities and countries will be torn apart and rebuilt. Some will be saved - many will not.

The second set of problems is technological. Com-

puters and automated systems will fail. The devices we have come to depend on will no longer be able to help us, and may even turn on us in a hostile or recalcitrant manner. Our thinking that we can invent intelligent machines will be exposed for the hubris it is, and again some will be saved but many will perish.

Across these runs another dimension of likelihood. This dimension is dichotomous (I would say "binary" but that's what got us into the computer problems). You either believe or you don't, like

young-earth creationism or the value of immunisation. When you combine these two dimensions you get a four-way Panic and Pessimism Matrix. There is a fifth alternative, but this will be mentioned later.

The first, and most pessimistic, of the cells in the matrix is that the four horsemen will ride into a landscape already devastated by the loss or failure of computer systems. The computer problems are just part of the overall plan. We have created the tools of our own destruction and, like the wings of Icarus, they will fail when we come face-to-face with reality and our limitations are exposed.

The next cell is where the computers fail but the religious and social pessimism fails to come true. We are left starving in the dark, broke because the banks can't operate, communications gone as the Internet and telephone systems crash. There will, of course, be looting, violence and murder, but it will be generally good-natured as people just provide for their families and readjust to a subsistence society based on village life.

The third cell is where the apocalypse comes but the computers keep on working. You may wonder why this is a less pessimistic scenario than losing the computers, but think of the advantages. Society, law and order might collapse, but those of us with Internet connections will be safe in our houses as we order food, toilet paper, ammunition, pornography and bomb-making instructions. On a personal note, there will also less demand for the lynching of computer experts.

The fourth scenario is that nothing will happen at all. This is the least interesting, which is why it has not been fashionable (or profitable) to talk about it.

When I set out to write this I was going to concentrate on the hysteria which has come from the computer industry about Y2K. I had originally thought that the hysterical end of the spectrum was a lot like the superstitious or religious millennialist crowd. There was a belief in illogical and contradictory nonsense and a readiness to believe anything. Examples of gullibility



Peter Bowditch, Brian Watts and Brian Miller

were everywhere, and danger was seen where there was no rational possibility of a problem.

Some examples:

1. I remember starting the pacemaker rumour about two years ago when I told some earnest person that my only Y2K worry was that the software in my pacemaker would decide that too much time had passed since the battery was changed and then turn the thing off. I thought the notion was just too absurd for even the silliest Y2K fanatic to believe, but the person I told it to just nodded. A few weeks ago this came up in a discussion between computer professionals and someone told me that perhaps we should ask an electrical engineer "who might know what he is talking about". I gave him the web addresses of six pacemaker manufacturers who were sick of telling people that pacemakers do not care at all about the year.

2. The application form on the web to join the Australian Computer Society asks for date of birth. Because Americans kept putting the date backwards, I added a note to the on-line form asking for dates in dd/mm/yy form. Someone complained that this was not Y2K compliant and the ACS should set an example. I refused to change it on principle, because I felt that the ACS staff would have little difficulty working out which century members were born in

3. One expert reported that a network hub was not compliant and needed to be replaced with one that was. As a hub contains no logic and is just fancy sort of double adapter, one would have to doubt this expert's honesty as well as sanity.

4. After adverse publicity, Microsoft had to issue a modification to Windows 98 to address a condition which was so improbable that nobody with any grasp of numbers or statistics could imagine it happening. I will talk about this example in more detail later.

There was also a tendency to treat real problems which have trivial solutions or work-arounds as though the problems were huge.

1. Credit cards with two-digit expiry years – as credit cards are never more than five years old the arithmetic to check dates is pretty simple

2. Cases where what matters is the pattern of days, not the actual year - traffic light systems, air conditioners, video recorders where using 1972 as the year gives the same pattern of weekend days.

As I was thinking about this, another thought kept coming to me. Maybe the way computer professionals were behaving was not like the survivalists or the religious millennialists. I started to think about the term "computer science" and then it struck me. The analogy here isn't with end-times fundamentalists, it's with creationists. I was looking at a classic pseudoscience. "Computer science" has the same relationship to real science as "creation science" has.

Every university in the country has a computer science department. Maybe they should be renamed "computer studies" to indicate the danger of influences like postmodernism and the presence of gurus, ogres and absolute truths. If computer science really is pseu-

doscience, we may have more worries about Y2K than we thought.

Let's look at some of the pseudoscientific (or anti-scientific) aspects of computer science. The definition I am using for real science is "an open system based on sceptical enquiry, with its ultimate appeal being to evidence".

There is a belief among computer people that bug-free software is possible, and this belief causes supposed experts to gloat that large software companies must be incompetent because they keep issuing updates. Unfortunately, writing software is extremely complex and there is no theoretical way to prove that any program (other than the most trivial) does what it is supposed to do in all circumstances. The method employed is to test a program to see if it works without considering why it might work (or not work), so Y2K testing consists of putting in some dates and seeing what comes out. Often, the criteria for accepting the correctness of a program is that it runs to the end without crashing. This is the source of the aphorism "All's well that ends". This is a lot like the alternative medicine quacks who know what works so clinical trials are a waste of time and money. No theory, just results. (I have had some correspondence recently with Dr Jaques Benveniste, he of transmission of water memory by email fame. I said that my knowledge of science made me sceptical of his theories, and he replied that he had no theory, just replicated results.)

Another pseudoscience indicator is the total inability to grasp probability and statistics. The creationists are always quoting the probability of a wind through the Boeing warehouse blowing a 747 out the other end. The Windows 98 problem I mentioned earlier is something like this, where an almost inevitable outcome is claimed for a series of temporally related but unpredictable actions following a precise (but highly improbable) set of initial conditions.

On the other hand, with in excess of 300 million personal computers in the world, it doesn't take a very high natural problem rate to produce very large numbers of problem cases. One problem per year on average (which is very optimistic) gives about a million problems per day, so I predict about 30 million problems in January 2000 which will be blamed on Y2K, even though they have nothing to do with it. If there is only a million-to-one chance of something happening to you, it could be happening 18 times a day in Australia. (You may think that I am contradicting myself here saying that highly improbable things both do and don't happen. Stats 101. The Windows 98 case is the *a priori* prediction of a specific event; the natural problem rate is random variation exhibited in a huge population.)

More evidence of pseudoscience is the ignorance of the history, fundamentals and literature of the discipline. Magnetic healers, perpetual motionists and mind readers all act as if what they are doing hasn't been tried before and they all reject or ignore any other opinion.

1. The editor of one of Australia's most prestigious computer publications once ridiculed *Byte* magazine for giving a lifetime service award to Commander Grace Hopper of the US Navy, saying that he could see no way anyone from the Navy could have anything worthwhile to do with computers. Grace Hopper was one of the people responsible for the

invention of high-level programming languages (and she was the first to use the term "bug"). Not knowing about her was like a physicist not knowing about Newton. The editor got a promotion to an even more prestigious paper.

2. I did a Unix course at a well-known university once and the lecturer made some absurd statement about a capability which he said was first implemented in the "C" programming language. I pointed out that it was in COBOL, where it was mandatory, and he told me that I was wrong because he didn't know that, and COBOL wasn't used any more, and anything that old could not have any relevance to today, ...

3. I don't know how many times I have heard that the Y2K problem is caused by saving space when writing in COBOL, but COBOL has had the capability since 1963 of storing a four-digit year in two character positions. The technique may not have been used, but that does not excuse experts from knowing about it. I wonder what else they don't know?

4. There have been techniques around since the 1970s for structuring programs and managing development so that it is possible to know where particular pieces of data are used and you can find, for example, dates and change how they are stored or acted upon.

5. One of the most-heard complaints from members of the Australian Computer Society is that the Society wastes money publishing the quarterly *Australian Computer Journal*, which contains academic articles which "have no relevance to the real world of computing".

6. There are no barriers to entry into the computer business, and age and experience are devalued. To become a computer expert you simply have to declare yourself to be one. To test this, go to any computer shop and ask the youthful expert behind the counter to define the term "megabyte" and see if he (invariably a "he") can answer without using the word "byte".

I mentioned postmodernism, and you may wonder what that could possibly have to do with computers. About a year ago I became involved in an argument about people writing Java programs which could crash someone's web browser. I was told by someone (from a university computer science department) that Java programs were just streams of bits like any other streams of bits, that bad results were caused by misinterpretation of the bits, that a bad program could not be written, and that it was Microsoft's fault if its browser could not execute the programs. When I suggested that not all streams of bits were equivalent, I was ridiculed for not understanding the problem. When I said that I had two CDs in front of me, one with Windows NT4 on it and the other with Beethoven's 9th *Symphony* and could someone please explain how my CD-ROM drive knew the difference, I was ignored. Another person told me that viruses were caused by Windows, apparently because Windows runs programs written for Windows!

(As an aside, Java is the newest and most fashionable programming language. It was not until two years into its development that someone noticed that its inbuilt date functions allowed two-digit years to be stored. Some people are slow to learn.)

You would think that all this confusion and ignorance would make me pessimistic about computers and Y2K. The computer people may be telling us that everything is in hand, but this is like finding out that chiropractors have taken over a major teaching hospital. The people we rely on don't know what the real problem is and don't know how to fix it. But they believe they do. Despite all this I am optimistic, simply because most of the disaster scenarios I have seen have been highly unlikely anyway and a large amount of money has been spent, much of it to prove that the fears were baseless.

There is actually an upside to all this. Even if the whole thing turns out to be a complete furphy, businesses have been forced to look at systems and procedures and to implement risk analysis and disaster plans. Hopefully, computer people have learned something about the value of planning and documentation, although, as I have mentioned, we knew about these 20 years ago. I am not too worried that the world is going to end, but I just might buy a couple of extra rolls of toilet paper and some beans.

So, to answer the question "Is there still time to panic?", the answer is, as expected, "yes and no". There is always time to panic, even when everything possible has been done, yet there is no benefit to panic when inevitability is showing itself above the horizon.

I mentioned a fifth scenario. All of the above may become moot when the planets and the sun all line up in early May 2000 and the world is torn apart by tidal forces. Now, there's something to really panic about.

To return to London in 1524:

At last the morn, big with the fate of London, appeared in the east. The wondering crowds were astir at an early hour to watch the rising of the waters. The inundation, it was predicted, would be gradual, not sudden; so that they expected to have plenty of time to escape as soon as they saw the bosom of old Thames heave beyond the usual mark. But the majority were too much alarmed to trust to this, and thought themselves safer ten or twenty miles off. The Thames, unmindful of the foolish crowds upon its banks, flowed on quietly as of yore. The tide ebbed at its usual hour, flowed to its usual height, and then ebbed again, just as if twenty astrologers had not pledged their words to the contrary. Blank were their faces as evening approached, and as blank grew the faces of the citizens to think that they had made such fools of themselves. At last night set in, and the obstinate river would not lift its waters to sweep away even one house out of ten thousand. Still, however, the people were afraid to go to sleep. Many hundreds remained up till dawn of the next day, lest the deluge should come upon them like a thief in the night.

On the morrow, it was seriously discussed whether it would not be advisable to duck the false prophets in the river. Luckily for them, they thought of an expedient which allayed the popular fury. They asserted that, by an error (a very slight one,) of a little figure, they had fixed the date of this awful inundation a whole century too early. The stars were right after all, and they, erring mortals, were wrong. The present generation of cockneys was safe, and London would be washed away, not in 1524, but in 1624. At this announcement, Bolton the prior dismantled his fortress, and the weary emigrants came back.



Visitors from space

Ian Plimer

This is part of a paper presented by Ian Plimer at the annual Conference in Adelaide. A follow-on piece will appear in the next issue.

There was a time, not so long ago, when scientists were revered. With their knowledge, they were going to free us from pestilence, feed us, make our lives more comfortable and rid us of the menace from Commies, the Yellow Peril, Nazis and those of similar ilk. We feared disease, starvation and those who supported some sort of ism. We have all become beneficiaries of this technologically-wired world.

In the western world, most of these former fears now no longer exist and we now have new fears such as a global greenhouse, species extinction, genetic engineering or an environmental nightmare. Ironically, we have little knowledge of basic science in what purports to be an advanced society, yet we exercise judgement on these complex scientific issues. Science is now to be feared¹, which is irrational, but there are a few phenomena to be feared, one is which an extraterrestrial visitor. Science may never be able to avoid the unavoidable.

The threat from out there

For 4,500 Ma², Earth has been bombarded by meteorites and comets. After an initial period of high bombardment from 4,500 to 3,800 Ma, the rate of impacting by extraterrestrial bodies (bolides) has been constant. By measuring the age and size of impact craters on the Moon, the frequency of bombardment of the Earth and its moon has been calculated.

Craters on the Moon

From 4,500 to 3,800 Ma, the Solar System was massively bombarded by extraterrestrial bodies. Craters on the Moon provide a window into what the early Earth was like, and, because the Moon has never had running water to reshape, erode and recycle its surface, the lunar craters give us the complete history of bombardment of the Moon and Earth by extraterrestrial bodies. The oldest known meteorite is dated at 4,560 Ma, which therefore must be considered the minimum age for the Solar System. There are some very large and old lunar craters, some of which were so large that deep fractures were formed. The rebound from these fractures caused melting deep in the lunar

mantle, causing massive outpourings of lunar lava, filling the huge lunar craters with molten rocks to become lunar "seas" (maria). Lunar craters filled with smooth lava can be seen from Earth with the naked eye. Early Earth would have been little different.

Effect of an impact on Earth

The geological record shows that large impacts may have coincided with massive volcanic eruptions on several occasions, and that Earth may have been shaped profoundly by these extraterrestrial bombardments. For

example, a small impact into the ocean would be cushioned by sea water, but a 10 km sized asteroid would punch through the ocean as if it were a shallow puddle and would break the thin rigid crust of the ocean floor. Fractures would propagate deep into the mantle, depressurisation of the mantle would produce partial melting, resulting in the release of a million cubic kilometres of molten rock, with the fractured mantle being the locus for a mantle plume. This release of molten rock would affect the convection currents in the mantle that carry the plates of Earth, thereby inducing the fragmentation of continents.

Earliest terrestrial impacts

The dating of lunar rocks and the measurement of lunar craters show that there was a very high rate of planetesimal, meteorite and comet impacts on the Moon between 4,500 to 3,800 Ma. There is no reason why the Earth should have escaped this massive bombardment. There is a faint record of this period of increased bombardment in the rocks of Isua (south west Greenland) which are older than 3,800 Ma. These rocks contains grains of typical meteorite minerals, as do rocks found in the Jack Hills area (WA) which is older than 3,600 Ma. This is a

needle-in-a-haystack search for evidence of massive bombardment of early Earth by extraterrestrial bodies. Even at 3,800 Ma, the impacting was twenty times greater than at present.

Cometary impacting on Jupiter and Earth

The early history of the Solar System involved the gravitational attraction of dust, meteorites and comets to form larger planetary masses. This process is still taking place. We saw the spectacular impact when the comet Shoemaker-Levy 9 hit Jupiter on July 16, 1994. The massive gravity of Jupiter sucked in the comet and



Ian Plimer addresses the convention

water, carbon disulphide, carbon dioxide and other materials were added to Jupiter's mass - the planet accreted into a slightly larger planet.

Early in the history of Earth, a passing icy comet might have been captured by the Earth's gravitational field, crashing onto Earth and adding huge amounts of water to our planet. Such comet impacts still occur, the latest significant recent impact was in Tunguska, Siberia in 1908. It was relatively small, the comet being only 20 to 40 m in size - it was only equivalent to 1,000 Hiroshima bombs, a deafening explosion was heard by passengers on a train on the TransSiberian Railway 350 km away and, if the comet had hit six hours later, it would have wiped out St Petersburg. A thousand square kilometres of flattened trees and a telltale iridium concentration in soils were left as a result of the Tunguska impact. Tunguska-size (or larger) impacts occur, on average, somewhere on Earth every 300 years. During recorded the human history of Earth, some 15 Tunguska-sized hits would have occurred, with a dozen hits in the ocean and the rest on land. Planet Earth has regularly suffered hits and near misses from comets.

Ancient Australian impacts, times of sudden melting

There were three periods in ancient Australia when there was a mass outpouring of molten rocks. These events, at 3,500, 3,000 and 2,700 Ma, are well recorded in the Kalgoorlie and Pilbara areas. Mass outpourings of molten rocks as volcanics, and the rise of large bodies of granite, occurred at the same time that very small spherical pieces of glass blanketed the Earth. This is highly suspicious and suggests that there were large asteroidal impacts which showed the Earth with glass and triggered global melting events. Such events are so far back in the past that they may never be satisfactorily pieced together.

However, one such event has been unequivocally identified. The 3,250 to 3,240 Ma sediments of the Fig Tree Group (Barberton Mountain Land, South Africa) contain glass spherules, the chemical signature of meteorites, high pressure minerals, meteoritic minerals and the products of impact volatilised silicate vapour contaminated by extraterrestrial material. Two layers of impact debris very accurately dated at 3243 ± 4 and 3227 ± 4 Ma have been identified. Equivalent material should occur in the Sulphur Springs Group (Pilbara district, WA) because it appears that the impacting was on a large scale and the fallout products should be widespread. At that time the crust of the Earth was hot and very thin and such mega-impacting was probably in the oceans because of the lack of shocked quartz. Mega impacting led to the formation of widespread large quantities of molten rock

Palaeoproterozoic impacts

Throughout these early times, Earth was still sporadically bombarded by large visitors from space. In the 2,470 Ma Dales Gorge Member of the Hamersley Basin, there is a faint clue that Western Australia was hit by a large visitor. Small spheres, which were once glass, are present in what was volcanic rocks which had been re-worked by water and it has been suggested that the impact was in the ocean.

The best documented impact at this time was at 2,020 Ma which formed the Vredefort dome in South Africa. Although more than 11 km of rock have been removed by erosion since that event, the broken and shocked rocks still remain. Another impact at 1850 Ma at Sudbury, Ontario broke and shocked rocks and established a geothermal cooling system which lasted for 4 million years. Impacting formed fractures that went deep into the mantle and the depressurising and rebound induced massive melting in the mantle. Molten rock rose to the upper levels of the crust and then solidified as huge saucer-shaped bodies of mantlelike rocks in Ontario, Canada and Eastern Transvaal, South Africa.

Australian Mesoproterozoic impact

A meteorite hit the Wiluna area (WA) at 1,630 Ma to form the Teague Ring, some 30 km wide. Shocked, broken and fractured rock are present, as are the telltale chemical fingerprints of extraterrestrial material. This impact site is now called the Shoemaker Impact Structure in honour of Eugene Shoemaker who spent most of his life studying meteorites and Australian impact structures, and died in a car accident near Alice Springs in 1997. In an attempt to ascertain whether there was ice in small craters at the Moon's pole, a probe containing the ashes of Eugene Shoemaker was blasted into the Moon in July 1999. This first burial in space detected no water on the Moon.

A Neoproterozoic cluster?

An extraterrestrial visitor hit the Goyder area (Arnhem Land, NT) and blasted out a crater which could have been anything from 7 to 25 km in size. The timing of this impact is uncertain but was between 1,400 and 1,200 Ma. In Finland, 1,400 Ma red sandstones contain micrometeorites suggesting that there was a swarm of cosmic material which hit Earth some 1,400 million years ago.

At about 590 Ma, an asteroid 4 km in diameter, travelling at 25 km/sec, hit the Gawler Range of South Australia. A crater 85 km in diameter was formed and is seen as the present day Lake Acraman. The unusual 1,600 Ma volcanic rocks from the Gawler Range were blasted out and fell as dust and boulders in an area blanketing most of South Australia. This blanket in a rock, known as the Bunyerroo Formation, can still be seen on the Flinders Ranges. The blast debris dropped into shallow water and is composed of pieces of the Gawler Range Volcanics, shocked grains of quartz, rounded fragments which were once glass, a high content of iridium and a high content of material typical of outer space. At that time, there was a local minor mass extinction of primitive life in South Australia and a rapid radiating of life immediately after the impact. The impact dust cloud would have blocked out the Sun over much of the Southern Hemisphere for many years and a giant tsunami would have scoured the Australian continent.

There are other Australian meteorite impacts which occurred sometime between 900 and 570 Ma. These ancient impact sites are now preserved as geological structures with shattered and shocked rocks. The identified impact sites are the 18 km Glikson structure

(Savory Basin, WA), Kelly West structure (Tennant Creek, NT; 8 to 20 km wide), Spider structure (Kimberley, WA; 13 km wide) and the Strangeways structure (Arnhem Land, NT; 26 km wide).

Life and death

Post-Cambrian explosion mass extinctions

Since the explosion of life at 570 Ma³, there have been five major mass extinctions (430, 368, 245, 214 and 65 Ma) and numerous minor mass extinctions. We are living in a period of a human-induced minor mass extinction, especially of the terrestrial macrofauna. The geological time scale is based on the appearance/disappearance of species⁴. Some of the geological time boundaries are defined by bolide-induced mass extinctions and, with further work, it may well arise that the geological time scale becomes a chronicle of impact-related major and minor mass extinction events.

Major mass extinctions are rare events with the most likely cause being impacts from extraterrestrial bodies. (Some 70% of bodies which hit Earth are asteroids, the rest are comets.) There is a growing recognition that Earth is rarely impacted by a solitary bolide, and that bolide clusters are more common. However, the recognition of impact craters and fallout in Mesozoic, Palaeozoic and Precambrian rocks is far from easy. Only large extraterrestrial bodies can cause a mass extinction with the minimum size for a mass extinction causing asteroid being 10 km in diameter, which would blast out a crater 150 km in diameter. On average, 65% of life disappears in a mass extinction.

Close encounters of the extraterrestrial kind

Minor mass extinctions can be caused by smaller extraterrestrial impacts, climate change, changes in the ocean or atmospheric chemistry, disease, volcanism or continental drift. There is a strong suggestion that minor mass extinctions occur every 26 million years hinting that the periodic orbit of asteroidal swarms close to Earth might be important. However, calculations show that only 5% of the asteroids which cross the Earth's orbit have been recorded. A recent 1 km sized asteroid, 1989FC, was only twice the Moon's distance from Earth. This was far too close. This asteroid was only spotted after it had passed through the Earth's orbit!

Goodbye Sweden and another cluster

While life was diversifying⁵, another big event took place. Siljan, in Sweden, was struck by two huge extraterrestrial bodies at 368 Ma. The impact site was under water and a crater 53 km in diameter is still preserved. The impact melted the floor of the sea and a waterspout carried bits of the sea floor, glassy melts and meteorite fragments high into the atmosphere. The crater floor was compressed, shocked and rebounded and minerals, which form only at extremely high pressure, were left on the floor of the crater. The sea floor peeled like an orange to give a deep crater, with a lip formed by the blasting out of crater floor material.

Shock waves went through the planet and rocks on many parts of Earth were triggered into melting and breaking. The shock waves from the impact went deep into the Earth, surface grains of quartz were shocked

into another form of quartz (which we can now create at nuclear bomb test sites) and tepee-like structures beneath the impact site were formed. A tsunami engulfed all of Scandinavia, vegetation was flattened and Scandinavian life was destroyed. A layer of sand and gravel, with bits of glassy material and meteorite fragments, was left behind and the backwash filled the craters with sediment.

There was so much material blasted into the Earth's atmosphere that sunlight could not penetrate to the Earth's surface. Earth became a cold dark place. Vegetation, which relies on photosynthesis, and floating marine organisms died, the food chain collapsed and this led to a major mass extinction of life forms which thrive at the surface of the continents and oceans. The most common survivors were those in the Southern Hemisphere, those which lived in the ocean depths and burrowing organisms. This was the second of the major mass extinctions on Earth that occurred since the explosion of life.

Life, which did not become extinct as a result of the Siljan impact at 368 Ma, still had a few more trials and tribulations. Other massive extraterrestrial bodies hit planet Earth, which formed a 15 km-sized impact crater at 360 Ma (Kaluga) and a 54 km-sized crater at 357 Ma (Charlevoix). Organisms, weakened by the Siljan impact, were pushed to extinction by the Kaluga and Charlevoix impacts. There is a 7 km wide impact structure (Piccaninny, Kimberleys, WA) which contains fragmented rock. The impacting took place at or before 360 Ma. A little later, also in the Kimberleys, is the tell tale iridium concentration in muddy rock, coincidental with minor mass extinctions, suggesting that again life might have been affected by an extraterrestrial impact. These impacts indicate that there may have been an extraterrestrial cluster which hit Earth between 360 and 370 Ma.

Death of a planet

The Permo-Triassic extinction – an enigma

Icehouse conditions came to a sudden end at 245 million years ago, the end of the Permian Period and the start of the Triassic Period. A mass extinction at 245 Ma resulted in the loss of many species, possibly more than 95 per cent of all species on planet Earth. This was the greatest crisis in the history of planet Earth. If there had been a 100% kill of advanced life at 245 Ma, then bacteria would have had to start the whole process again, and life on Earth would probably have been completely different from how it is today. Who knows, the dominant animal on the continents might have then evolved to be a hybrid of a lawyer and green slime!

Where are the impact craters?

The cause of this major mass extinction is unknown. The most likely possibility is that there was an asteroid of more than 20 km in diameter that hit Earth, however the evidence is not strong. There is the possibility that this mass extinction is related to the 247 ± 5.5 Ma 40 km wide impact crater at Araguainha in Brazil. This Brazilian impact site might indicate that there was an extraterrestrial cluster which hit Earth around about 245 to 250 Ma. Calculations of lunar impacting rates, Earth

impacting rates and astronomical measurements show that in the last 250 million years of Earth history there should be 30 craters of more than 100 km diameter and 3 craters of more than 300 km diameter. Over the history of time on Earth, there should have been half a dozen impact craters greater than 500 km in diameter and a few craters more than 1,000 km in diameter. New craters are being found all the time but only a fraction of these large impact sites have been recognised, especially in older rocks.

If the Araguainha crater was the impact site of an extraterrestrial body that almost wiped out all life on Earth, then the evidence should be widespread and more convincing and the Araguainha crater should be far bigger. An impact to produce a solitary crater 40 km in diameter is hardly big enough to produce the greatest mass extinction of life on Earth. Small amounts of shocked quartz blasted out of an impact crater at some 248 Ma have been found in Antarctica and southeastern Australia but the source is unknown. However, if the Araguainha crater formed from a cluster of extraterrestrial bodies which hit Earth, then there is the tantalising possibility that there are many other craters of this age. Because quartz is found on the continents and not the ocean floor, shocked quartz derives only from continental impacts. An impact into the oceans hundreds of millions of years ago is far more difficult to detect and, because the oceans occupy 70% of the surface of Earth, then 70% of impacts are expected to be in the oceans. These impacts would produce tsunamis and volcanic outpourings.

Oil drilling in sedimentary basins has given many clues about old impact sites. Oil drilling east of Shark Bay in WA gave some faint clues and a 120 km diameter circular structure, which only appears from gravity and magnetic measurements, was recently drilled with a view to ascertaining whether it was a major impact site. A structure this size indicates that the source extraterrestrial visitor was big enough to cause a mass extinction. The re-drilling of the structure, now called the Woodleigh Impact Structure, showed typical impact shock features, glass and debris. At the time of writing, the date of the impact was somewhere between 350 and 200 Ma. A confident prediction of a 245-250 Ma age was made by the scientists involved in the project. If the age is 245-250 Ma, then it appears that at the time of the mass extinction at 245 Ma, planet Earth was hit by yet another cluster of extraterrestrial bodies.

Impact-induced volcanism

Volcanism could be the smoking gun from a cluster of large impacts. The coincidence of massive rapid outpourings of one million cubic kilometres of lava (Siberian traps, 248.3 ± 0.3 Ma) at the same time suggests a tantalising relationship between impacting, outpourings of huge volumes of lava over a very short period of time and mass extinctions. The Siberian eruptions ejected great quantities of gas into the atmosphere. The carbon dioxide led to global warming whereas the sulphuric acid aerosols led to global cooling and, with the Siberian eruptions, the end result was global cooling. In the Sydney area, 245 Ma soil horizons show structures resulting from permafrost. Although a short-lived climate change might not be the reason for

the mass extinction, the volcanism in Siberia that could have poisoned the atmosphere with sulphurous gases.

Other possibilities for the 245 Ma mass extinction

Another type of extraterrestrial cause for this crisis in life at 245 Ma is gaining support. Every few hundred million years, a star explodes within a few tens of light years from Earth. At that distance, high energy particles and radiation from the explosion would strip away the Earth's ozone layer for hundreds of years. With no ozone layer, ultraviolet light from the Sun and the supernova would penetrate the atmosphere, changing its chemistry and killing surface life. Hot gas plasma from the explosion might also have disrupted the Earth's magnetosphere and allowed cosmic rays to reach the Earth's surface which would cause more damage. In Japan, China, India, Armenia, Iran and Hungary what could be the debris of an exploded star has been found in rocks that are 245 Ma. Dredged up from the sea floor in 1300 m of water near Mona Pihoa in the South Pacific are clues that exploding stars affect Earth. The sediments dredged up from the sea floor only represent the last 13 Ma and contain traces of iron 60. This unusual form of iron can only be formed by a flood of high-energy particles from a supernova explosion a few hundred light years away. The short half life of iron 60 (1.5 million years) and other supernova relics such as plutonium 244 are such that they can not be detected in material as old as 245 Ma. Nevertheless, there is a tantalising possibility that the biggest mass extinction of all time was related to a supernova explosion.

It has also been suggested that at this time there could have been widespread depletion of oxygen, while others have suggested that the mass extinction could have had a biological origin such as an algal bloom (similar to the modern day red tides) or a trans-species disease (like AIDS or Creutzfeldt Jacob Disease).

Life after death

The greatest casualties in the Permo-Triassic extinction were shallow marine, floating and terrestrial animals. Again, the most common survivors lived in specialised niches such as the deep oceans and burrows but there were some surprises. For example, plant life in the Southern Hemisphere was relatively unchanged. Immediately after the mass extinction, the vacated ecologies were rapidly filled.

Triassic impacting in Australia

An impact occurred somewhere between 220 and 245 Ma to form the Lorne Basin, 25 km SW of Port Macquarie (NSW), where there is a circular structure 30 km across and 350 m deep. Glass with embedded silica spheres contains metallic iron and high temperature mineral grains. Hills of granites (North Brother, Middle Brother and South Brother) dated at 210 Ma may represent melts which later moved up from deep fractures caused by the impact. Calculating the likelihood of extraterrestrial impacts by asteroids greater than 20 km in diameter over the last 120 million years, has shown that there should be a few more impact sites in NSW. These have not yet been found.

The impact-induced Triassic-Jurassic boundary

Throughout its history, the Earth continued to be hit by clusters of meteorites and comets. This process again took place at about 214 Ma, the end of the Triassic Period and the beginning of the Jurassic Period. There was also a mass extinction at 214 Ma. A 220 ± 10 Ma old, 80 km wide, crater (Puchez-Katunski) and two impact craters dated at 214 ± 1 Ma at Manicouagan and Rochechouart in Quebec, left craters 100 km and 25 km in diameter respectively. Other smaller impact craters are known from this time. They are St Martin (40 km, 219 ± 32 Ma), Obolon (15 km, 215 ± 25 Ma) and Red Wing (9 km, 200 ± 25 Ma). Impacting by these extraterrestrial bodies triggered earthquakes, volcanoes and tsunamis.

Impacts and plate tectonics?

The mass extinction at 214 Ma, a massive volcanic outpouring in the central Atlantic Ocean and the beginning of the fragmentation of the continents are an uncanny coincidence. It might be the smoking gun which shows that the impacting of a cluster of extraterrestrial visitors suddenly jolted Earth into another geological era. Planet Earth had become quite used to impacts producing billowing clouds of dust, glass and fragments which blacked out the Sun and cooled the planet.

The pulling apart of continents and massive outpourings of volcanic rocks is probably due to convective mantle plumes of slightly molten rock and it is well known that mantle rocks partially melt to volcanic rocks by either heating or suddenly depressurising.

Massive outpourings of volcanic rock can result from both a mantle plume or depressurising as a result of impact rebound. Impact sites are the locus for numerous very deep fractures and such sites not only could be the locus for a new mantle plume but could also be the site for the outpouring of lava.

The Jurassic-Cretaceous boundary

A minor mass extinction occurred at 145 Ma and 42% of all species disappeared. This time marks the end of the Jurassic Period and the beginning of the Cretaceous Period. Again, this mass extinction is probably related to unwelcome extraterrestrial visitors. A 145 ± 3 Ma old 340 km wide crater (Morokweng, Kalahari Desert) may be the cause of this mass extinction. This is a huge crater, and other smaller craters from this time suggest that Earth was yet again hit by a cluster of comets and meteorites. The 40 km wide Mjolnir crater formed at 142 ± 2.6 Ma. There are also two impacts in Australia from this time. The 24 km wide crater at Gosses Bluff (NT) formed at 142.5 ± 0.8 Ma and the 3 km wide Liverpool Crater in Arnhem Land (NT) has broken and shocked rock of a similar age. Gosses Bluff has a crater, broken rock, ejected rock, shocked minerals and glass formed

from impact melting and is probably one of the best-preserved ancient impact sites in the world. Impacting by a swarm of meteorites and comets may have initiated the break up of continental Africa and the outpouring over a very short period of time of masses of lava in the Sudan.

Australian Cretaceous impacts

Another impact occurred, this time in Queensland at Tookoonooka in the Eromanga Basin. A 55 km wide crater was blasted out at 128 Ma. Although the crater is now covered, the tell-tale signs of shattered and broken rock, glass formed from the melting during impact and a subsurface crater-like structure are the only clues left. Elsewhere in the Eromanga Basin at Talundilly, a 30 km wide subsurface structure of the same age was detected during oil exploration and this has now been identified as an impact crater.

The 13 km wide crater in the Yallalie Basin (WA) is now covered but broken and shattered rock and subsurface structures might be the signs of an impact cluster which occurred at around 90 Ma. At this time, there was a runaway greenhouse on Earth and massive submarine basaltic volcanism.

Dinosaur demise

The Cretaceous-Tertiary (K-T) boundary

Another major mass extinction, the KT extinction, occurred at 65 Ma. The Earth then was still a steamy hot tropical planet. This extinction was caused by a random extraterrestrial event and some 76% of all species disappeared, including the dinosaurs⁶. A meteorite more than 10 km in diameter was heading for Texas. Something went

drastically wrong, it missed and hit Chicxulub in the Yucatán area of Mexico to form a crater 170 km in size. An earthquake of Richter magnitude >10 would have affected the whole planet.

Effects of the Chicxulub impact

The impact blasted water, sediment, molten rock and bits of meteorite high into the atmosphere. A tidal wave engulfed most of North America, Central America and adjacent coastal areas. The mass of sediment on the continental shelf collapsed in giant turbidity currents into the ocean deeps to give a cocktail of debris and shallow water fossils in deep water settings. Such turbidity currents were triggered by >10 Richter magnitude earthquakes of impact origin. In North America, forests were destroyed by a huge tsunami, animals and plants perished and a layer of sand and mud was deposited over the landscape. The planet suddenly became dark and cold, plants and planktonic organisms died and the food chain collapsed. Falling debris was heated by friction as it fell to Earth and the shower of boiling hot rocks started global bush fires which have

The Doomsday Cult Calendar

January 2000

M	T	W	T	F	S
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Our thanks to reader Brian Giffen for this wonderful artefact that has relevance to this story.

been recorded in places as far apart as Denmark and New Zealand.

The debris layer from the falling material ejected from the impact crater covered the globe with choking dust. The dust is now exposed as a clay-rich layer with small pieces of glass from the melting of the rocks at the impact site at Yucatán. The dust layer also contains charcoal fragments, high pressure quartz, diamond grains, high temperature nickel-rich spinel minerals, shocked quartz grains, pieces of meteorite, fullerenes (fire-produced high temperature carbon compounds from bushfires) and the chemical signature of extraterrestrial material (iridium, chromium and helium). Bits of meteorite in sea floor sediments at the K-T boundary have been found in drilling of the floor of the North Pacific Ocean. The debris layer from the impact covered the planet. For example, in the Boticcione Gorge near the medieval city of Gubbio in the Appenine Mountains of Italy, a thin clay horizon is the evidence that the dinosaur world ended. At the boundary, there are fossil traces of earth worms that burrowed into the mud consuming every trace of the biological material which died at 65 Ma. Such is life.

Over 75% of species became extinct, the best known of which were the dinosaurs and ammonites. Both floating and deep water marine animals suffered a catastrophic collapse. Immediately after the impact, some species suddenly spread and thrived (ferns, insects, mammals).

The K-T extinction at 65 Ma might have had an additional deadly factor. The rocks in the Yucatán area are carbonates and rock salts. A meteorite impact would have vaporised some 300 billion tonnes of sulphur and 700 billion tonnes of water. In the stratosphere, sulphur oxides and water vapour combined to form an aerosol layer which would have blocked out the Sun, prevented photosynthesis and chilled the planet for a few years. The planet would have been covered in billowing choking sulphurous fumes.

Faunal stress and dinosaurs

There is by no means agreement regarding the extinction of the dinosaurs at 65 Ma. The thought of obliterating dinosaurs with one meteorite impact is attractive but things are often not as simple as they seem. For 4 million years before the impact in the Gulf of Mexico at 65 Ma, trouble was brewing. The marine environment was stressed, highly evolved animals became extinct, others became rare and evolution of the floating animals virtually came to a standstill. The reason for these changes before the K-T extinction may be related to cool fluctuations (66.8 to 66.5 Ma) and a short warming (65.4 to 65.1 Ma) induced by a change in ocean currents.

The Chicxulub impact, the Deccan traps and bolide clustering

The Chicxulub impact occurred at 64.98 ± 0.05 Ma. Almost at the same time there was a very rapid outpouring of 3 million cubic kilometres of lava in India (the Deccan Traps, 65.3 Ma) and the initiation of volcanism to form the submarine Carlsberg Ridge and the Emperor-Hawaii Seamount Chain. It is probable that such a massive impact triggered volcanism and mantle

convection currents resulting in the massive submarine volcanism. This volcanism belched out sulphuric acid aerosols which would have induced global cooling, and carbon dioxide, which would have induced global warming. The end result was atmospheric cooling by about 1°C.

The history of impacts on Earth and the observation of the impact of the Shoemaker-Levy 9 impact with Jupiter shows that isolated impacts are rare. More common are clusters of extraterrestrial material impacting with Earth over a period of time. For example, some 100,000 – 200,000 years after the Chicxulub impact in Mexico, there was another impact in Poty in north eastern Brazil.

The coincidental impacting, rapid and massive outpourings of lava, faulting, rifting, mantle convection currents and mass extinctions of life seems to have happened many times in the geological past and suggests that great changes on our planet may be triggered by extraterrestrial events.

An Early Tertiary impact in Australia

At about 60 Ma, Australia was hit by another meteorite which formed a 9 km wide crater in the Connolly Basin of the Gibson Desert (WA).

The Eocene bolide cluster Worldwide impacts

There was another global event in what is known as the Middle Eocene. Some 30% of life became extinct in a minor mass extinction at 36 Ma. This extinction was probably related to a swarm of meteorites or comets which caused impacting because there are craters in North America at Chesapeake Bay, NJ (90 km diameter, 35.2 Ma) and Popigai, Siberia (100 km diameter, 35.7 Ma). In North America, the Chesapeake Bay impact structure is the largest site but it is part of a North American multiple impact field which sprayed molten rock over a wide area. There is a 10 million square kilometre area of eastern North America and the West Indies where glass blasted out of impact craters has been found. This impact debris, now glass, was reworked by tsunamis and massive submarine debris flows.

In Italy, a layer at 35.7 Ma contains abundant shocked quartz, sand-sized grains of glass and minerals typical of the interaction of meteorites with the Earth's atmosphere. In the Timor Sea, evidence from petroleum exploration is now being found that there may be more than 40 submarine impact craters. It has been suggested that this crater field represents a cluster of extraterrestrial visitors who arrived between 37.5 and 24 Ma or a cometary fragmentation event similar to the Shoemaker-Levy 9 comet impact on Jupiter. A far smaller impact took place at Mount Toondina, Oodnadatta area (SA) and the 4 km wide crater formed at or before 35 Ma.

Tutankhamon's cosmic gem

The mountainous dunes of the Great Sand Sea in the Egyptian Sahara hide many secrets. A few thousand tonnes of a greenish-yellow glass lie scattered in the dunes near the border with Libya. The glass contains bubbles, very high temperature mineral grains and wispy white and black layers. It contains more than 98%

silica, is unlike any known volcanic rock and has been dated at 28.5 Ma. The glass contains the telltale chemical signature of extraterrestrial material. No impact crater has been found. Two sites of oval to circular shaped areas of glass have been located and it has been suggested that a meteorite about the size of a house formed the glass from the vapourisation and melting of sandstone. The friction and massive shock wave in the atmosphere in front of a falling meteorite compressed and heated the atmosphere, the meteorite shattered in mid-air 10 to 12 km above the desert and the heat from the explosion melted the sandstone beneath. Prehistoric tools 100,000 years old made of this impact glass have been found in the Sahara Desert and the centre stone from a scarab found in Tutankhamon's tomb is composed of the impact glass. The ancient Egyptians obtained this cosmic gem in the desert some 700 km from the centre of their civilisation.

Eocene volcanism?

Was impacting was so intense that the rebound shock caused the melting of the Earth's mantle and a violent short-lived volcanic episode at 35 ± 2 Ma covered the Ethiopian Plateau with basalt?

An Eocene bolide cluster?

This spread of ages and the large number of recognised impacts indicates that the Earth was hit by a cluster of bolides which produced the craters from 37.5 to 24 Ma at Chesapeake Bay, Popagai, Timor Sea, Mt Toondina and Egypt.

Yesterday's impacts

The East Pacific Ocean

The Earth at 2 Ma was an exciting place. There was a rapid global cooling with profound changes to the flora and fauna, a sudden diversity in the genus and species of hominids on Earth and an extraterrestrial visitor. An asteroid some 3 km across travelling at 12 km/sec hit the east Pacific Ocean at 2 Ma and sent a water spout nearly 20 km into the air and sprayed 250 cubic kilometres of water vapour high into the atmosphere. The water vapour formed ice clouds that shaded the planet. The impact formed tsunamis 100 to 200 m high in the open ocean but when these tsunamis reached the shore, they could have been 25 times higher.

This might explain the mixture of bones of marine and terrestrial animals remains in the mountains at Pisco, Peru which look as if they have been thrown together in a washing machine. Trace remains of microscopic fossils from the deep sea floor are present

in the Transantarctic Mountains more than 2,500 km from the shore. These might have been thrown up from the ocean floor together with all the water that flew into the sky and dropped on Antarctica. Another such impact today would destroy more than half of the planet's human population.

Raining glass

There might have been another cluster of extraterrestrial visitors resulting in a number of impacts occurred between 1.1 and 0.7 Ma. Neither impact can be correlated with a mass extinction of life on Earth. In West Africa at 1.1 Ma, glass was blasted out of a 10.5 km diameter impact crater. Most of the glass fell into the ocean. At Tonle Sap in Cambodia, a 100 km wide crater formed as a result of an impact 770,000 years ago and fragments of black glass were sprayed all over the Indian Ocean, Australia and SE Asia. These are the tektites of inland Australia. Their shapes show that on entry back to Earth, they were spinning and, as a result of the frictional heat of re-entry, melting. Button, disc and dumb bell shaped tektites are the most common types. (The button shape of tektites was copied by NASA as the perfect shape for a lunar re-entry module.) By using some radioactive dating techniques, we can show that they derived from material dated at 1,100 Ma and that this material went for a trip in the upper atmosphere

where it was bombarded by cosmic radiation. When the material fell through the atmosphere, the frictional heat was so intense that the temperature of the tektite reached 2,000 °C. We can calculate the exact date of entry as the remelting of the flanges of tektites reset the isotopic clocks.

A meteorite hit Mt Darwin near Queenstown (Tas) 740,000 years ago to form a 1 km wide crater.



Ian Plimer discusses his paper during a break in proceedings

ter. The ancient rocks were melted by this small impact, solidified to form glass and are locally known as Darwin glass.

Wolfe Creek, Australia

Australia has enjoyed long periods of aridity coincidental with glaciation on other parts of the globe. The lack of widespread or intense pluvial activity in Australia over the last 2 million years has allowed good preservation of impact craters. At the time when Neandertal lived in Europe 300,000 years ago, another meteorite hit Australia. The Wolfe Creek Crater in the Kimberleys of Western Australia was blasted out and the 880 m wide crater still contains bits of the meteorite which did the damage. The basement rock was melted, solidified and glass at Wolfe Creek is still abundant.

Things that go bump in the middle of the night

During the last 5 million years when we humans have been evolving on planet Earth, three impacts occurred which caused craters greater than 10 km wide to form. These are at Bosumtwi (Ghana), Zhamanshin (Russia) and Elgygytyn (Russia). Since humans appeared on Earth, between 200 and 500 extraterrestrial bodies several hundred metres in size impacted on Earth. About two thirds of these fell into the oceans producing huge tsunamis. The records of tsunamis several hundred metres high is understandably poor. However, few population centres historically existed around the Atlantic and Pacific shores and the cradles of civilisation emerged from the sheltered valleys around the smaller seas (Mediterranean Sea, Red Sea) or mountain areas (Andes, south Indian highlands). The growth of civilisation around the shores of oceans may well have been interrupted by tsunamis caused by extraterrestrial visitors. Common threads exist in ancient lore such as falling stars, sky fire and floods and the myths and legends of the ancients may not have been just dreaming.

Bombardment of Australia during aboriginal times

There are numerous impacts which took place during human occupation of Australia. There is no doubt that some of these impacts would have been seen as they occur in areas where there has been partial habitation for thousands of years and the effects of even a small impact would have been seen and heard from hundreds of kilometres away. The Boxhole Crater (NT) is 170 m wide and formed 30,000 years ago. Fragments of the original meteorite have been found. The age of the 70 m wide Veevers Crater in the Canning Basin (WA) is not exactly known but it is less than 20,000 years old. Shattered rock and bits of meteorite were also found here. The exact age of the 29 m wide Snellings Crater in the Kimberleys (WA) is also not known but it is probably less than 5,000 years old. The 24 m wide Dalgara Crater (Yalgoo, WA) also contains bits of meteorite and the crater was blasted out by impacting less than 3,000 years ago. At Henbury (NT), there are 14 craters from 6 to 180 m in size resulting from impacting 4,200 years ago. An iron meteorite exploded just before impact, sprayed Henbury with high velocity meteorite fragments which blasted out craters, melted rock, left behind smaller pieces of meteorite fragments and polluted the area with material from space.

Comets and Kiwis

A study of the history of humans on Earth suggests that there may have been a great cometary impact 9,500 years ago. Scientists have recognised consistent patterns in ancient writings suggesting cometary impacting 6,000 to 3,000 years ago. Maori stories of huge fires in the Tapanui region of the South Island, NZ and a crater-like feature again suggest a more recent cometary impact.

Comets as portents and signs

Historically comets have been interpreted as portents and signs of difficult times in the future.⁹ This is possibly related to some degree of fact. There is a correlation between increased cometary impacting and global environmental shocks that lead to the onset of "dark ages"

for society, famine and the destruction of cities and populations.

In fact, cometary impacting might have had a profound effect on the human population of the Earth over the last 5,000 years. A cometary impact, such as that which hit Tunguska in Siberia in 1908, can trigger earthquakes, volcanic eruptions, tsunamis and the release of poisonous gas from the sea floor. Nevertheless, we happen to live on the only planet in our Solar System that can support life and, because of the infrequency of large extraterrestrial visitors, it is a very safe planet.

The period 2354 to 2345 BC was one of cometary impacting, leading to untold misery: mass famine, destruction of cities and populations, earthquakes, tsunamis, volcanoes and poisoning by gases released from the oceans. It is thought that the disasters (including the falling of "red hot stones" from the heavens) led to the collapse of Egypt. Another event of comet activity was at a maximum around 1600 BC as recorded in the Bible and contemporary Chinese writings.

The cometary impacting from 1159 to 1141 BC may have triggered earthquakes, tsunamis and volcanoes in some places in the world. The famine in the Biblical account of King David's reign probably occurred as a result of this event of cometary impacting. Another cometary impact took place in the period 208 to 204 BC and it appears that the aftermath of this event led to the downfall of the Ch'in Dynasty in China, suggesting that most of the comets hit Asia. Another cometary impacting period from 536 to 545 AD may have led to famine and the beginning of the Dark Ages in Europe.

Effects on humans

Nomadic clans of hunters and gatherers could have better adapted to the sudden global changes of a small impact than an agricultural civilisation which depended upon optimal climatic conditions such as sunshine, temperature and rainfall. Urban populations today are even more fragile because they depend not only upon agriculture and transport but infrastructure which is vulnerable to tsunamis, earthquakes, fire and flood. A relatively small extraterrestrial body, 100 m in diameter, would produce an impact which would release energy equivalent to a 30,000 megaton nuclear explosion.

The effects of natural phenomena on human history are probably underestimated. During the time humans have been on planet Earth, alternating icehouse and greenhouse conditions forced migration, creativity and rapid human evolution. Earthquakes, volcanoes, extraterrestrial impacts, tsunamis and gas releases have weakened and destroyed whole civilisations thereby opening the door for the next phase of history (eg the Thera eruption of 1470 BC led to the collapse of the Minoan empire and the rise of the Mycaeneans and ultimately classical Greece). The same has happened to all life forms on Earth with mass extinctions and the sudden filling of newly vacated ecologies. Storytellers passed on the record and interpretation of such natural events to the next human generation. By the time such stories had been written down, they had been embellished and modified many times as they crossed cultures and moral overtones were added¹⁰. Such stories now represent the coded messages of great events in the past.

And tomorrow ...

Poesy

A Skeptic's Prayer

Rosemary Sceats

*O doubting Saint Thomas
Please make me like you
If you help me I promise
To believe only what's true.*

*I'll seek the evidence
And check all the facts
Please don't allow me
To become lazy and lax.*

*Extraordinary claims
Require extraordinary proof
If this is not followed
May we all hit the roof.*

*They say seeing is believing
But it may not be so
"To believe it is to see it"
May be the way to go.*

*How can I tell it
From make-believe?
Please, Saint Thomas
How can I know?*



The Swift-Tuttle Comet crossed the Earth's orbit in 1737, 1862, 1992 and, in 2126, will only be 14 days flight from Earth. This comet is twice the size of the extraterrestrial mass which struck Earth at 65 Ma and resulted in the dinosaur-killing mass extinction. Only 5% of the asteroids which cross the Earth's orbit have been recorded. For example, the 1 km sized asteroid, 1989FC, missed the Earth by 650,000 km, only 6 hours flight away. This asteroid was only spotted after it had passed through the Earth's orbit and if it had struck Earth in 1989, it had the potential of destroying civilisation. If 1989FC hit the land, a 10 km wide crater would have formed from the impact, the energy released would be equivalent to detonation of the total global nuclear arsenal and massive earthquakes of Richter magnitude >10 would be triggered. Tens of thousands of square kilometres around the crater would be burned and the billions of tons of rocks and dust thrown into the atmosphere would cloud the stratosphere, lower atmospheric temperature, block photosynthesis for several years, create acid rain and destroy the ozone layer. Impact of 1989FC into an ocean basin would trigger tsunamis which would destroy civilisation around the ocean.

A 1.6 km wide asteroid, 1997XF11, has a calculated near Earth pass in the year 2028. Swarms of smaller near-Earth and Earth-crossing asteroids are known and the probability of Earth being hit by one of these smaller bodies is 1 in 10,000 to 1 in 20,000 years. Civilisation destroying impacts occur every 300,000 to 1 million years. During the time humans have been on Earth and assuming that the average human lives to 75 years old, humans have the same chance of dying in a jet aeroplane crash as from a cometary impact. It is still infinitely more unsafe to smoke, drink alcohol or cross the road, so I can live with the odds of being wiped out by an extraterrestrial visitor.

We can only wait for the next cometary impact. History tells us that it will not be long. The next bolide has your name on it.

Notes

¹ Creationists fear a release from their ignorance into the uncertainty of scientific knowledge and the ambiguity of theology.

² For scientists, rational people and Skeptics, Ma means millions of years ago. For creationists, Ma means last Tuesday.

³ By ignoring the preceding 3,300 million years of evolving single and multicellular life, this becomes that blinding moment of creation for those at Answers in Genesis.

⁴ Creationists assert that the geological time scale is based on radiometric dating. It is somewhat pointless to explain to creationists that the geological time scale was devised on faunal and floral fossil assemblages well before the discovery of radioactivity. Skeptics will not be surprised to learn that although radioactive dating became an independent accurate established technique, the geological time scale has now been quantified but not changed.

⁵ For scientists, rational people and Skeptics, evolution. For creationists, just ignore it.

⁶ For creationists, this presents an insurmountable problem. As a result of four preceding global mass extinctions and numerous minor mass extinctions, there is a worldwide sequence of fossilised critters. If critters suffered a turbulent watery sinful end in the "Flood of Noah" some 4,000 years ago, such a worldwide sequence would not exist. Such a sequence was recognised well before Darwin was a little boy.

⁷ Dear creationist readers, just ignore this turpitude. The Devil makes me do it.

⁸ Calm down Skeptics. It is only real scientists and eminent people that have things named after them.

⁹ This theme should be pursued by oxymoronic creationist scholars.

¹⁰ This reference is to the literal and infallible Word of our Lord.

The hominid succession

Helen Lawrence

Creationist myths were a legitimate approximation to the truth at a time when an answer to where we came from was not known. This is no longer the case. We *do* know, and in some detail. We have been bred from proto-human forms. About eight million years ago or somewhat less, a common ancestor gave rise to the chimpanzee family, *Pan*, and us. The chimpanzee is the ape most closely related, with only one percent of molecular difference between our genus and theirs. Evidence of evolution of species has become apparent on many scientific fronts, but nowhere can it be more dramatically demonstrated than in the human fossil record. In the Australian Museum in Sydney, a long line of skulls shows the progression through proto-human to human form, known collectively as *hominids*. In the hominids, brain size has increasingly outstripped body size in relative proportion. The museum exhibit is visual evidence that there is no break in sequence, no possibility of separating ourselves as something special. *Homo sapiens* is simply part of the hominid succession.

It is difficult for our species to grasp the meaning of deep time, of one species changing to become another. Outside the pages of science fiction we do not expect a chimpanzee to give birth to a human being, and we know this has never happened. Instead, there has been gradual change in the skeleton, brain and external features such as body hair, along with almost no change in internal organs. In the eighteenth century, Peter Camper dissected an orang-utan and was rather alarmed by this! New species are formed by an event causing isolation from the parent group. Differences accumulate, to the extent when it seems reasonable to define a new species. Humanity, as part of the living world, has followed this pattern. I intend to show, in brief, how these forms have succeeded one another.

There has been a regular cascade of fossil evidence in the last two decades. So many of our ancestors have been discovered that it takes a body of scientists to describe them all. Not only can hominid bones be identified, but their individual brain volume can be estimated along with their height, weight, walking mechanics, arm and leg length and hand function. These techniques are augmented by the study of stone and bone tools and the things that hominids made with them; the study of animal bones - what the hominids were eating; and by climatology and palaeobotany - what the climate was like and what grew under those conditions. All of this information is backed up by geologists and dating experts. Geologists are widely accepted as knowing a lot about rocks, but dating methods are very technical and harder to grasp. Every scientific discipline is prone to error and must be open to review, but to say that all dating is suspect is layman arrogance and a kind of insanity. Basically there are four dating methods:

a) dating using radioactive methods, eg radiocarbon

dating of charcoal; decay of uranium to daughter isotopes;

b) dating by release of electrons trapped over a time period, eg thermoluminescence;

c) dating using polar magnetic reversal which happens at known times and which aligns particles in rock north/south, reversing them when there is a polar reversal;

d) dating using chemical changes, eg breakdown of amino-acids; change in the nitrogen and fluorine content in bones. (As bones age, nitrogen is lost but fluorine is gained, absorbed from ground water. These two measurable changes can be used to check one another).

Since one method can be checked by several others, verification can be carried out. For instance, when a hominid skeleton is found, the bones themselves are dated if possible, but the actual rock strata where they were found is also submitted to dating, sometimes by several of the above methods. The strata may contain animal bones which can be dated by a known stage in their evolution. Added to all these checks is the information from the geneticists. Recently, a sample of DNA in the femur of the first found *Neandertal* has been examined. It differs from the human version which makes *Neandertals* almost certainly not close relatives of ours, although the DNA profile does suggest we share genes through a common ancestor in Africa, 600, 000 years ago.

The earliest hominids

Our divergence from the ape family probably began to happen rather less than 8 million years ago when we had a common ancestor who ate fruit and nuts and occasional meat for extra protein and who lived mostly in trees. The famous 'Lucy', found in Ethiopia by Donald Johanson's team and named after a Beatles song *Lucy in the Sky with Diamonds* is much nearer to us than this common ancestor with apes. Lucy lived a bit over three million years BP (BP = before the present). She was tiny, one metre or so tall, but walked upright. Hominids like Lucy left their footprints in volcanic ashy mud at Laetoli in Tanzania. There were two or three in the party, their tracks showing clearly that they were walking on two legs. In the last decade or so, several of Lucy's forebears have turned up in the same general area and have extended the hominid record back towards the common ancestor.

Lucy's specific name is *Australopithecus afarensis*, since she was found in the Afar triangle, a dry arid region of Ethiopia now, but wetter then with gallery forests along the rivers. Lucy had a wide pelvis, a cone-shaped rib cage and relatively long arms. Her skull was smallish and her jaw V-shaped. An ape jaw is a three-sided rectangle and a human jaw is an arcade; Lucy's was in between in shape. Lucy's great age and



"Lucy" from Johanson & Edey (1990)

the fact that she walked very much like us was considered remarkable. She was indeed a "missing" link. But we now have some older missing links. One of them, dated to approximately four million BP has a knee joint which suggests, from the shape of the tibia, that she/he walked upright. An even older fossil, at 4.4 million years is *Ardipithecus ramidus* (*ramidus* = root) which has teeth that show the beginnings of human-like features. Teeth are very telling in the unravelling of the characteristics of fossil hominids. Analyses of rates of eruption of teeth suggest that the human pattern was a very late development, so that most of the hominids mentioned here had apelike tooth development patterns. Evidence for erect walking shows the opposite trend. Some body bones of *A. ramidus* have been found and are under study and it may turn out that this hominid also walked upright. These fossils show us species in the process of



"Taung Child" from Jurmain et al (1998)

change, as do the ones that came after them, presaging ourselves.

In the 1920s, Raymond Dart, an Australian, found the skull of a child of about six, now known as the 'Taung Child'. He named the genus *Australopithecus*. The anthropological world regarded the hominid status Dart gave the fossil with scepticism because it had some ape-like characteristics, but there were also many human-like traits in the teeth and skull, which contained the fossilised brain. When other finds turned up that were similar, Dart was eventually vindicated. One of the finds, named, curiously, Mrs Ples, was of the gracile, light-boned type as was the Taung Child. A robust strain and a gracile strain can be seen running right through the hominid record, a bit like plough-horses and racehorses. This genus extended well to the north, to Olduvai. Here, Louis Leakey found a robust *australopithecine* with a keel on its head like Athena's helmet. He promptly named him 'Dear Boy', but he was also known as Nutcracker Man because of his huge molars. Dear Boy and others like him lived about two million years ago and roamed from the Red Sea to the Cape Province.

The genus *Homo*

In 1964 Louis and Mary Leakey assigned contemporary fossils to the genus *Homo* after having found four individuals along with their primitive stone tools. This is a marker point, the beginning of the genus *Homo*, the first intentional tool makers, not just opportunistic tool users like chimps cracking nuts with a stone. Because they made tools, these hominids were called *Homo habilis*, meaning handyman. Louis Leakey was looking for



"Dear Boy" from Jurmain et al (1998)

human-like ancestors which were very old. He wanted to live down the Piltdown scandal and find a big-brained skull to show genuine antiquity of human characteristics. Louis was delighted when his son, Richard, found a large brained fossil related to *habilis* which came to bear the title of ER-1470 (ER stands for East Rudolf, the former name for Lake Turkana). A notable school of thought regards ER-1470 as type specimen of a separate species, *Homo rudolfensis*. The

first dating result suggested that this fossil was about three million years old, but a firm revised date is 1.9 million BP. The verification process for this famous fossil involved finding bush pig fossils of known date alongside the hominids. As the pigs were younger than the proposed three million year date, strata samples were re-checked. The new revised date made better sense because it was a good fit with the known evolutionary time scale. It is interesting to follow the activities of the anthropological teams and where they worked. All sorts incidents are related about 'digs' in popular books, packed with human interest and excitement.

The line leading to *Homo sapiens*

To continue the 'succession', 1.5 million years ago was the heyday of *Homo erectus* and/or *Homo ergaster*. *Homo ergaster* was a light-boned (gracile) hominid, while *Homo erectus* tended to be hyper-robust. The gracile 'Turkana boy', found at Lake Turkana, Kenya, and dated to 1.6 million BP was light-boned and long-legged. He was about eleven, already tall and slim like a Zulu or Maasai boy. He and his kind probably led to modern humans. *Homo erectus* was a great coloniser who penetrated as far as China and Indonesia at a time of low sea level when you could walk most of the way from Singapore to Timor with only short sea crossings intervening. This was never so for Australia, which cannot be seen from Timor.

There are anthropologists who think that *Homo erectus* evolved *in situ* into Chinese, Indonesians and Australians, though this view is losing ground to the camp who are convinced that the cradle of humankind was Africa. The geneticists say so too. This means that there was a later wave of colonists who were anatomically human and who penetrated as far as Australia. The date for entry into Australia is currently considered to be about 60,000 BP. Colonists from Indonesia would have had to use seaworthy boats to cross a deep sea trench that would not have been dry land during any past climatic period.

Australia is extremely important in the fossil record because thousands of skeletal parts of the original inhabitants have been found and they are *all* anatomically modern. The inference is that *Homo erectus* was halted in Indonesia by the sea, although there is some tentative evidence that 800,000 years ago he/she got to Flores, an Indonesian island which is separated by a sea trench from the main archipelago, so that getting there could have entailed boats, rafts, logs or riding on elephants! The Australian evidence ties in with the fact that the human race is genetically homogenous. Things like skin colour and hair type are superficial. When it comes to blood analyses, we are all one family.

Some of these hominid types coexisted. For instance, a robust *australopithecine*, *Australopithecus* or *Paranthropus boisei*, coexisted with *Homo habilis*, and subsequently *Homo ergaster*, over a period of a million years in both East and South Africa. In the earlier part of the twentieth century, anthropologists did not think there could be more than one human line stretching back into the past. Now we know that it has been much more complex, with the blending of human-like into apelike physique. And all the time the brain was growing larger and more expensive to maintain. A high protein diet was essential for feeding this exotic organ with blood

containing nutrients. Walking upright occurred *before* this portentous change in the brain and was therefore not motivated by freeing the hands to use tools. That 'idea' came later, when *handyman* had evolved a brain with a volume of 600 - 800 cc.

There is a good deal to be said for *Homo ergaster* leading to *Homo sapiens*. A type of DNA called *mitochondrial DNA* is useful in working out lineages. It is passed down the female line. *Mitochondrial Eve* certainly had a navel! This puts the Garden of Eden in Africa, about 150 - 200,000 years ago. At that time, *Neandertals* were living rough in Europe. There were glaciers reaching down into France and Italy, which made sheltering in caves essential, probably with fires to warm them and meat kept outside in the deep freeze. Round about 100,000 years ago *Neandertals* moved into the warmer Levantine area, where they met *Homo sapiens* already installed, having come up from Africa. Both humans and *Neandertals* belong to the genus *Homo*, but it is possible that they are different species. The question of whether *Neandertals* and humans interbred is unresolved. Recently, a child's skeleton with hybrid features, aged about twenty-five thousand years BP and found in Portugal, suggests two things; that *Neandertals* survived for longer than was previously thought in the warmer parts of Europe, and that survivors may have interbred with *H. sapiens*, although this does not mean that we carry *Neandertal* genes, since according to the genetic evidence any putative hybrid line has petered out. *Neandertals* had a brain the size of ours, and in some cases larger, but it was differently organised, probably less inventive though perhaps more intuitive.

Another lineage problem is that *Neandertals* had a pre-*Neandertal* stage in Europe, known as *Homo heidelbergensis*. Some researchers insist that *Homo heidelbergensis* was quite widespread, present from Africa to China. Controversies between anthropologists also revolve around whether there was a worldwide *Neandertal* phase. However, these differences do not amount to altering Darwin's theory of evolution. That is rock solid.

And so our human characteristics have been gradually amassing over a period of at least four million years, with many false starts and side branches, consolidating into their present form about 150,000 years ago. Around 30,000 BP we had the dubious distinction of becoming the *only hominid*. The ultimate success of *Homo sapiens* has to be measured against the length of time our species lasts. But how did we begin? How did we gain ascendancy? Although we can probably be exonerated from genocide of the *Neandertals*, we have progressively destroyed a great many animal species and world environments. However, our species has pragmatic ingenuity in abundance which means we are often able to rectify our mistakes and avert complete catastrophe. We also invented a very flexible system of communication - language. Language is closely linked to awareness of self, a development which almost certainly took place even before we became human.

A chimpanzee's adventure in self awareness, captured on film, shows its dawning realisation that the chimp in the mirror is not another, perhaps hostile, chimp, but miraculously, itself. It is graphic proof of the origin of our consciousness. The chimps are first favourites at Taronga Zoo. They draw the biggest crowd.

People marvel at their agility, but an over-reaction is to laugh uproariously at their antics. The resemblance is uncanny enough to cause disquiet. Laughter may be a cover for embarrassment. On the other hand, the apes, now in danger of extinction, are a wonderful link with our past; a way to help us feel part of the animal world, an absolute imperative if we are to survive.

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Editorial note

"What's in a name?", demanded Juliet from the sanctuary of her balcony. Well Juliet certainly had her problems, but she was not the editor of a Skeptical journal, among whose readers are numbered the sort of people who could perform pedantry to Olympic standard.

It all began when we received the foregoing article from a lady in Tasmania. A very good article we decided; a neat encapsulation of the history of our species, its predecessors and cognates and one couched in terms that the lay reader could readily comprehend.

But one thing niggled at the editorial cerebral cortex. Throughout, she has spelt the *homo* species whose remains had first been discovered in the valley of the German river, Neander, as *Neandertal*. Now the editor claims no particular expertise in palaeontology nor indeed, in the German tongue, but he was fairly certain it was spelt *Neanderthal*, though pronounced without the *h*. But one thing this editor has learned is not to go along with gut-feelings without first checking the facts. Pull out the available dictionaries and books on the topic - yes, the *Collins English*, the *COED* and the *Penguin Dictionary of Archaeology* all confirmed the editor's visceral reaction, as did *Bones of Contention* by Roger Lewin, a number of books by Stephen J Gould and various others. Now that would probably have been good enough for the editors of *Nature* or *Science*, but here in the Skeptic's editorial suite we take our responsibilities somewhat more seriously.

However it did occur to us that this might be yet another example of "two great nations divided by a

common language", ie could it be a case of English English v American English? More information was necessary. First of all we emailed the author and asked for her views, which were that the *h*-less construction now seemed to be the accepted one, but more confirmation was needed, so we posed the question to two Skeptical email discussion lists, one local and one US based. That should have put the matter beyond doubt, you might have thought. If you did think that Gentle Reader, then think again.

The advice from each of the assembled intellects was clear and unequivocal, but it was also almost equally divided between the two options. Hope fluttered momentarily in the editorial breast when one of the respondents, Markus Poessel, was seen to have a German email address. "Aha" exclaimed the editor "Markus will know whereof he speaks. After all he speaks German like a native". Some chance. This is the text of Markus' response:

German: Neander-Tal or Neandertal = Neandervally. German before the spelling reform of the early this century: Neander-Thal or Neanderthal = Neandervally. Hence the valley's current name: "Neandertal"; and if you talk about that ancient homo there: *der Neandertaler*, at least in modern texts, with possible variations. (*So far, so good. But...*) Anyway, the Latin species name was fixed before the spelling reform: *Homo (sapiens) neanderthalensis*. Hope this clears things up. Ahhm.

So much for native speakers, time to call on the experts, so off to Colin Groves, our anthropological consultant:

Neandertal. The -th- spelling was old German, and was "modernised" early this century I think. But -

(1) the Brits, being ever so traditional, still prefer *Neanderthal*, and

(2) scientific names must not change, so but preserve their original spellings, so it's still *Homo neanderthalensis* with a haich.

From Mark Newbrook, our linguistics consultant:

Tal is a relatively rare and poetic word but if used now will be spelt with T alone. Along with some other such words it used to be spelt with Th (before the spelling reform mentioned), and that was the case when the derived term *Neanderthal* began to be used by German and then by non-German anthropologists. But a 1961 Duden dictionary gives the spelling *Neandertal(er)*, which suggests that at least some German-speakers now use the modern spelling even in the derived term.

Our tame geologist, Ian Plimer, weighed in with:

The word derives from the Neander Valley which, in German, is Neanderthal (old German) and Neandertal (modern German). However, as the critter was found when the use of old German was dominant, the word is *Neanderthal*.

As did palaeontological consultant Alex Ritchie who largely agreed with Plimer.

In the end it was all too hard, so we decided to go along with the author, on the purely pragmatic grounds that it would save changing all her spellings.

If any Gentle Reader thinks they would like to enter the debate, may we suggest they take it up with the German Embassy. As for us, apart from wishing the first examples had been found in a valley in an English speaking country, we'll now, and for evermore, refer to this species only as "the N people".

As Juliet knew, "that which we call a rose, by any other name would smell as sweet".



Alchemy and the art of deception

John Happs

Alchemy is considered a pseudoscience with documented origins traced back to at least 300 AD through writings by Zosimus although historians have recorded much earlier science-based knowledge about metals such as gold, iron, copper, tin and lead. There is ample evidence to show that even before the classical Greeks there were firm ideas about the origins of certain metals and artisans had practical skills in the working of these. It can be argued that the ancient pursuit of alchemy, as an enterprise to change "lesser" metals into gold, is a more recent activity and could well have laid down some useful foundations for modern chemistry and medicine.

Russell (1994) refers to a number of translated alchemical texts found in the thirteenth century, which had been written by the Arabic alchemist Jabir Ibn Hayyan some five centuries prior to their discovery. We can see from these and other works that alchemy had long been associated with quests for eternal youth (the elixir of life) and the production of gold from base metals, such as iron and lead. The common agent, needed for both quests, was the Philosopher's Stone which would transmute metals and act as a universal cure, providing immortality if taken as a medicine (Powell, 1976).

It is likely that stories from the Old Testament triggered early beliefs in a magic elixir since Genesis (Chapter 5) relates how Lamech lived for 777 years. He was a relative youngster compared with Enosh who lived 905 years; Kenan who lived 910 years; Seth who lived 912 years; Adam who lived 930 years and Jared who lived for 962 years. The real old-timer of course was Methuselah who lived for 969 years. Many alchemists believed that such longevity, displayed by these biblical characters, could be attributed to an elixir, who's secret was subtly hidden in biblical text. They also believed that such a secret could become available to the diligent experimenter and here we see clear links between alchemy and religion.

A number of mediaeval alchemists were thought to have actually discovered the elixir and Alaïes de Lisle was said to have discovered it when he was 50 years old and that the recipe enabled him to live for 110 years until the year 1298. Another aged character, who's name will be better known to skeptics, was Count de Saint-Germain who had useful connections with Louis XV. There seemed little doubt that the good Count had access to the elixir since he surpassed the biblical ancients by living for 2,000 years. Apparently, on one occasion he was telling a party of courtiers how he had been a close personal friend of King Richard I. He turned to his servant, asking him to verify his claim. With straight-face, his servant replied that he could not personally verify the claim since he had only been the Count's servant for a mere 500 years. No doubt,

Saint-Germain's servant also had ready access to the elixir.

The urge to find the famed essence took on almost manic proportions during the Middle Ages with great personal sacrifices sometimes being made. One desperate individual was Albertus Magnus, a thirteenth century scholar and churchman, who resigned his comfortable position as Bishop of Ratisbon to dedicate his life to alchemy in order that he might find the elusive elixir.

Saint Thomas Aquinas was a pupil of Magnus and he was one amongst many at that time who firmly believed in alchemical investigation as a means of finding the philosopher's stone which would turn base metals, such as iron, lead, mercury and pewter into gold. Gold was regarded as the most perfect metal whereas other metals were imperfect and in need of purification by alchemists. This purification could proceed in stages where silver was more purified than lead and almost ready to become gold. Leo (1972) points out how many alchemists considered that the essence could only be made with the help of God since the secret recipe, they thought, had been deliberately hidden within the Bible, available only to those who thoroughly probed the text.

Alchemists attracted the attention of the monarchs of the day who were constantly on the lookout for money. Naturally, these kings also wanted to control the practice of random gold production in case the country became flooded with the precious metal, rendering the local coinage valueless. King Edward I persuaded Raymond Lully to luxuriate in a lavish apartment in the Tower of London, in return for which Lully is said to have produced for the king about six million pounds sterling from base metals. We can assume that any evidence for this claim is purely anecdotal.

In 1404, the English Parliament declared that making gold and silver was a criminal offence yet, interestingly, in 1455 Henry VI relaxed this legislation. He allowed the good citizens of London, knights, chemists and monks to make gold in order that the King might pay off his debts. In Germany, Maximilian I, Rudolph II and Frederick II encouraged alchemical searching to the point where court nobles, acting out of sheer greed, imprisoned and often tortured many who were identified as alchemists until they found the "essence" and produced enough gold to satisfy their needs.

Some, at the time, thought that certain acids contained the magic essence, while others suspected animal or vegetable products. Hopes were variously pinned on alcohol or distilled spirits and, despite the lack of any real success, this frenzied searching led to the acquisition of many useful laboratory skills along the way. Hurd and Kipling (1964) list a number of procedures known to alchemists including solution, distillation, filtration, crystallisation, sublimation and amalgamation.

Alchemists were aware that different liquids have specific boiling points and they also knew that there was variation in the melting points and other properties of metals.

Alchemists demonstrated how some metals could be "killed" by heating them strongly in an open crucible (calcination) to form an ash. If a few grains of wheat were later added to the ash and the crucible reheated, then the metal was seen to be "revived". Oxidation and reduction were well-known to alchemists although not named as such.

It is probable that many useful discoveries were spin-offs from the unsuccessful quest for gold production and longevity. For instance, Roger Bacon, an alchemist in the thirteenth century, could have discovered gunpowder while searching for the essence although it has been suggested that he most likely came across the recipe for gunpowder from other, earlier sources.

Now, as all good Skeptics might suspect, when those early quests for the "essence" failed, it was only a matter of time before fraud would emerge as a more profitable option (Sherwood Taylor, 1976). Pseudoscientists and paranormalists of today, such as water diviners and psychics, are constantly reminding Skeptics that there are charlatans in their midst and only the gifted few should be taken seriously. Such warnings were prevalent in the alchemical past, to the extent that Pope John XXII, a friend of the alchemist Arnold de Villeneuve, issued a papal bull which expressed his recognition of many pretenders as opposed to the few true alchemists.

There are parallels between the pseudoscience and paranormal proponents of today and the alchemists of yesteryear in that there were practitioners who were sincere and honest even if they were misguided in their endeavours. Working alongside of course were those artful imposters whose manipulative skills could well have led them to become acknowledged spoon-benders and psychokinetic exponents, were they alive today. Their methodology was frequently investigated yet they continued to deceive some of the most intelligent minds around at the time, to the extent that it took centuries before the general populus started to reject a belief that had been accepted and widespread for centuries.

One investigator who was not deceived by the "successful" alchemists was Geoffrey who, in 1772, reported to the Academy of Science in Paris on the various ways in which the perceived feats of alchemy were stage-managed. Clearly the fraudulent alchemist had to start out with a good supply of gold, especially since the gold which was to be "made" in the crucible sometimes had to be presented to any distinguished members of the audience who needed to be impressed. No doubt this financial sacrifice often proved an excellent investment since a royal stamp of approval could set the alchemist on the road to riches in a number of ways.

Geoffrey outlined the following fraudulent methodologies:

The double-bottomed crucible technique involved the use of a copper or brass crucible which had a layer of gold dust or silver scattered on the bottom. This was then covered with a layer of wax. A base metal such as lead was placed in the crucible and the secret "essence" added with heating and the uttering of

mysterious words. When the wax melted, the gold or silver would be revealed for all to see.

The distraction technique used an ordinary crucible and the well-known trick of distracting the audience with one hand while surreptitiously adding gold or silver with the other hand.

The hollow rod technique employed a hollow wand into which gold dust was added before the end was plugged with wax. On stirring the hot mixture in the crucible, the wax would melt allowing the gold to settle out on the bottom of the crucible.

The gold coating technique involved the painting of gold fragments with a dark-coloured material which made the gold look like lead. In the hot crucible brew, the dark coating dissolved to reveal the gold.

Distinguished members of the audience were sometimes asked to provide the alchemist with an iron nail so that he might turn it into a gold nail which had been placed inside the crucible prior to the demonstration. The fact that the gold nail might not show any resemblance to the original iron nail was of little consequence since the audience was likely to accept that some change in shape or size would occur during any base-metal to gold transmutation.

The history of alchemy, with its obvious failures, is well documented and insightful. Rational people, reading about the alchemists and their supporters might hope that we have learned something from such episodes of history to become more cautious about claims which promise instant wealth or miracle cures. Frankly, general observations suggest otherwise.

Today, we can still see cases where vulnerable individuals have sacrificed their money, health and relationships in the search for instant wealth via get-rich-quick schemes or their addicted pursuit of casino jackpots. Others, more concerned with personal health problems, have pinned their hopes in alternative therapies which have offered miraculous cures where evidence-based medicine might have failed or worked too slowly for their liking. Again, the more vulnerable have been prepared to throw away their life savings and rational thought for the modern-day equivalent of the Philosopher's Stone, such as quack cancer cures or instant faith healing.

We know that the alchemists at least have left us with some useful spin-offs when the veneer of mumbo-jumbo is stripped away and I'm reminded by dowsers, psychics and iridologists that one day the scientific community will wake up and appreciate their contributions too. Some of them feel confident about having discovered something that our brightest scientific minds have somehow overlooked. On an optimistic note, it might be said that something useful will inevitably come from the peddlers of today's pseudoscientific and paranormal claims. As they say on the advert: "I'd like to see that."

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Through a Skeptical glass darkly: how not to read a book about psi

Damien Broderick

James Gerrand's review of my book *The Lotto Effect: Towards a Technology of the Paranormal* (Melbourne: Hudson Hawthorn) was published in *the Skeptic*, 13:2, in 1993. That's a while ago, I know, but I stumbled on it while reading the Australian Skeptics' web site, where the review has now been posted. It struck me that I might offer a lob back over the net, however belatedly.

It was gruesomely amusing to read Mr Gerrand's opinion of my gullible approach to the paranormal just a few months after modish young novelist, James Bradley, took me to task in *The Age* (17 April, 1999) for my latest book, the technophilic *The Last Mortal Generation: How Science Will Alter our Lives in the 21st Century* (Sydney: New Holland). Fashionably despairing, nouveau-mystical, Bradley called me 'Australia's most visible example' of 'techno-evangelism'. He was alarmed by my 'enthusiasm for the future' and 'fervour' because of its 'deep-seated intellectual intolerance'. He found me 'savagely dismissive of anything he sees as crypto-Christian wrong-headedness', and so on and so forth. It's a silly review, to my mind, but just the kind of thing one might expect to find levelled at arguments typical of... well, of *the Skeptic*, actually.

How odd, therefore, to find Mr Gerrand, just six years earlier, reproving me for equal and opposite crimes. 'Broderick, as is common among non-scientists, is misguided or off hand, when not being abusive, of the scientific approach.' Good grief. Can they both be talking about the same guy?

My long career as a science fiction writer is highlighted, apparently as evidence of my intellectual untrustworthiness - for instance, 'A scientist, not a science fiction writer, would have baldly concluded...', and 'Ray Hyman saw his job as being a scientist, researching, seeking the evidence, not as a science fictionist, glorifying his subject' - although many Skeptics seem quite pleased to count the late Dr Isaac Asimov and other sf writers among their number. Even granting the taint of this odious profession, I suppose I should even the balance-pans by throwing on my PhD in the similarities and differences of the sciences and the humanities, plus a number of academic books including *The Architecture of Babel* (Melbourne University Press), two best-selling popular science books, and a decade of reviewing other people's science popularisations in *The Australian*. I can't blame Mr Gerrand for failing to mention these titles, since most were published after *The Lotto Effect*, but it should have been obvious that my sympathies have never been with the anti-scientific obscurantists.

The review, in short, has a bee in its bonnet. It systematically distorts almost everything it touches. It opens with a whinge. My p. 2 mention of work on psychokinesis at Cambridge University (done by Dr Fotini

Pallikari-Viras under the auspices of Nobel Physics Prize laureate Brian Josephson, whose scientific credentials possibly equal Mr Gerrand's) cited a January 1992 press report. 'One would have expected at least a scientific paper as the basis.' I wish I could have provided one, but my 1992 book was late in production when I added that hot item of news; no journal citation was available. The incredulous and curious can now follow up the research of his paranormalist colleagues at Josephson's web site: <http://www.tcm.phy.cam.ac.uk/~bdj10/>

But Mr Gerrand was no happier that I copiously referenced the results of Dr Robert Jahn and Brenda Dunne and their colleagues at PEAR, the Princeton University anomalies research group. Their apparently striking results, he informs us, were reduced in statistical significance to 'a probability of 1 in 19, by Professor John Wendell (*The Skeptical Inquirer*, Fall 1991) pointing out the need for a more accurate statistical approach.' This might look like a killing rebuttal of my gullible and uninformed acceptance of PEAR's own estimates, but perhaps Mr Gerrand dozed off while reading pp.82-3, where I cited just this reassessment and critiqued it in turn: '[A]n expert in accountancy, Professor John P. Wendell, reported criticisms of traditional methods of evaluating the null hypothesis. "In a sense," Wendell admitted, "it is unfair to criticize Jahn here since he is just following a practice of using *p* - values as a measure of evidence against the null hypothesis that is apparently widely accepted in practice as indicated by [its] almost universal use [...] in scientific journals (including [*Skeptical Inquirer*])." 'In other words, Wendell's criticism applies as ruthlessly to the standard methods employed in most scientific assessments based on these statistical methods as it does to Jahn's. The details of his preferred method (designed by James O. Berger and Mohan Delampady, and applied to micro-PK research by William H. Jefferys in "Bayesian Analysis of Random Event Generator Data" in the *Journal of Scientific Exploration*) go well beyond the scope of a book like this one... The PEAR team, needless to say, dispute this assault on their methodology.

The non-specialist is obliged, as usual, to wait for the dust to settle.' Seven years later, while Bayesian analysis is increasingly in use (especially in economics), it certainly hasn't displaced more traditional methods. But note two features of this example. First, a reader of *the Skeptic* is encouraged to think that Wendell's criticism is news to me (and perhaps to parapsychologists). This seems dishonest. Secondly, I explicitly speak of the limited 'scope of a book like this one'. *The Lotto Effect* is not a treatise, not a scientific paper; it is a popular examination of then-recent anomalies research, combined with a somewhat rigorous report on my own investigation into possible evidence for pre-

cognition in Tattslotto entries. Even in that somewhat relaxed mode, however, I make my skeptical inclinations clear. How startling, then, to see Mr Gerrand referring to a chapter sarcastically entitled (hint, hint) 'Spooks and Kooks' only to claim that 'Broderick finds reality in the performance of the 19th century medium, DD Home, without mentioning that his claims are now regarded as very dubious.' Other readers might gain a different opinion from my actual words (p. 44): 'Reading about D. D. Home might make us wonder if that sort of irrational obfuscation has indeed been dispelled by the fluorescent light of science, or if it has just been reinstated in different terms. I don't know many hard-headed, tough-minded scientists capable of reading a compendium of 19th century paranormal studies without wishing to hurl the damned thing into the lab's autoclave for sanitation... It is not my business here to canvas such extreme claims.' Ah, well.

What of such assertions as this: 'He becomes abusive when criticising CSICOP's former chief investigator, James Randi... Broderick rubbishes Randi's four "Rules for Psychics"'? True, I do declare Rule 2 a 'slur': 'Cheating is a compulsion with the psychic'. I do so not because I hold any brief for self-appointed 'psychics', many of whom do seem to be fraudulent and others deluded, but because of the breathtaking universality of the Rule. It doesn't so much rule as rule out. The implicit assertion is that *any* claim of anomalous agency or perception can be *automatically* dismissed, since it comes from the mouths of compulsive cheats. Does this rule hold with the thousands of experimental subjects studied over recent decades in parapsychology labs? I doubt it, if only because many of them didn't know exactly what they were being tested for, and so wouldn't have had any incentive to skew their responses or any capacity to do so effectively. More to the point, Mr Gerrand left out my real criticism of Mr Randi and his advisers: his statistical ignorance. In large degree I share that ignorance, and so must depend heavily on the generous counsel of experts (some of them disbelievers in psi phenomena). I quote a number of places where Randi went horribly wrong in elementary calculations of probability. Yes, I admire his unmasking of phonies such as Geller, but I deplore the way this useful skill is generalised blindly into evidence of his capacity to debunk complex analytical procedures when he can't even tell the difference between four to one and five to one (p. 125), or grasp the meaning of two-tailed evaluations.

I am also held guilty, I suspect, of a rudimentary stupidity: 'He also argues that since science has at times to accept the apparently illogical, such as light being both a particle and a wave, then the illogicality of psi should be acceptable.' This verges on the often-heard assertion that psi researchers believe that because QT and psi are both weird, one must be explained by the other, or authorises belief in it.

No to both possible charges. I do suspect (as I briefly discuss) that certain approaches to fundamental theory in physics seem to permit access to limited kinds of time reversal, even without wormholes, closed timelike curves, and the like. Since I regard the accumulated evidence for psi as somewhat convincing (unlike Mr Gerrand, as is his privilege), it is useful to know that

these anomalous phenomena are perhaps not altogether inconsistent with known advanced physics. Moreover, specialists in QT (such as Dr Josephson and others) have sought to work back from their equations to possible but counter-intuitive empirical implications of such non-Newtonian oddities. Some psi experiments have been conducted on this exploratory, Popperian basis.

I will mention one recent and remarkable example in a moment. Finally, some passages in Mr Gerrand's notice are simply unfathomable. I mention that there is an inconsistency in the US Army, having found no clear evidence for psi, announcing their determination to maintain a watching brief on the field, that 'research in certain areas be monitored...'. Is this no different from CSICOP's continuing efforts to debunk claims of the paranormal (let's be honest here and not say 'investigate' as if the verdict were not already in)? Don't be daft. The Army isn't in the business of monitoring arant foolishness for the sake of it - unlike the CIA's interest in UFO reports, say, where disinformation can confound the enemy, secret stealth projects need to be covered up, and so on. If the Army's remote viewing program was indeed relinquished (as detailed in Jim Schnable's book *Remote Viewers*), isn't it funny that they retain an interest in new research on a topic they are now satisfied is all balderdash and cheating?

In the years since *The Lotto Effect* came out, anomalies researchers have continued to tighten their protocols in response to critique from within and without. A particularly tasty piece of work has been done lately by Dr Dean Radin (now at Interval Research Corporation, Palo Alto) and Professor Dick Bierman (University of Utrecht and University of Amsterdam). This provides evidence that subjects presented with a randomised set of calm and erotic/violent imagery show a distinctive 'presentiment' or galvanic skin 'presponse' two seconds or so *before* the shocking images are shown to them. The experiments have been replicated successfully. A paper by Dr Bierman is forthcoming in the *International Journal of Psychophysiology*. A preliminary 1997 paper by Bierman and Radin, 'Anomalous unconscious emotional responses: Evidence for a reversal of the arrow of time', with handsome charts and scrupulous *p* values, can be found at Bierman's University of Amsterdam web site:

<http://macwww.psy.uva.nl/tango/personen/personen.qry>

Mr Gerrand closes his review with what he perhaps regards as a killing blow: 'I would recommend this book as a good science fiction read'. Actually, of course, it would be dreadful read as sf narrative, which is far more sophisticated these days than a simple statement of a challenging idea. (For a sense of why this is so, you might try my academic book *Reading by Starlight: Postmodern Science Fiction*, from Routledge.) No, *The Lotto Effect* has to be read for what it is - an honest attempt (now slightly out of date) to convey with humour and some salient detail the baffling state of play in paranormal research. You also get to follow my own quest into the psychology of lottery punters - we're surprisingly docile and regular in our number choices, as a group - and the small hints I found that there might be some evidence there for precognitive psi. But Skeptics can breathe easy in one respect, curiously omitted in Mr Gerrand's review: I show fairly conclusively that

Continued on p 41 ...

Breatharianism – just a lot of hot air?

Rosemary Sceats

Jasmuheen

At the time of writing, it is less than a week since we were treated to the national spectacle of *60 Minutes'* total demolition job on Brisbane New Age guru Jasmuheen, aka Ellen Greve or Ellen Ellison, depending on which magazine (*Who*) or newspaper (the *Brisbane Courier Mail*) you read. Jasmuheen's claim to fame is her alleged ability to live on "prana" or, in plain English, light and air, having dispensed with the need for food and drink. To put it more romantically and spiritually, she lives on the divine one within her.

Jasmuheen has documented this extraordinary claim (where is the extraordinary proof?) in her book *Living on Light*, and along with her convicted and jailed fraudster husband Jeffrey Ferguson, makes a lucrative living from her CIA (Cosmic Internet Academy) website by selling books, tapes and devices to reduce car exhaust emissions.

If you can ever bring yourself to visit the CIA website, you will find it hard to keep a straight face when encountering the unmitigated drivel that fills it. Indeed, I find it hard to believe that Jasmuheen herself could have maintained a straight face as she wrote or loaded the material on the site.

As seen on *60 Minutes* during a tour of her home (in the portrait gallery of assorted deities and other immortals), the pantheon of her fantasy world is populated by such cosmic luminaries, who communicate with her via cosmic telephone, as:

- Count St Germain, who has been alive for hundreds of years under many guises and in various incarnations, including William Shakespeare, Merlin, Christopher Columbus, Joseph, the (foster) father of Jesus, and the prophet Samuel.

- Kuthumi (Koot Humi), an "Ascended Master", aka St Francis of Assisi and Pythagoras, and a product of the fertile imagination of Madame Helena Blavatsky, ex-circus performer, con-woman extraordinaire and founder of the Theosophical Society. Koot Humi was also recycled by H. Spencer Lewis as one of the heroes of his AMORC (Ancient Mystical Order of the Rosy Cross) Rosicrucian scam. The self-styled "Dr H. Spencer Lewis, PhD", the tautology of the "Dr" and "PhD" being a dead giveaway that his doctorate is fake, probably an honorary one conferred on him by the Rosicrucian University founded by him in California (where else?), claims to be descended from the pioneering American explorer Meriwether Lewis. (NB Claim illustrious ancestors to gain instant credibility and respectability.) In fact, as revealed in a recent television documentary about the famous Lewis and Clark expedition, Captain Meriwether Lewis died without progeny.

- Babaji, another immortal guru lifted straight out of the pages of Paramahansa Yogananda's *Autobiography of a Yogi*, hailed as a spiritual classic, but in reality largely a compilation of Indian spiritual and yogic myths and fairy tales rivalling those of the Brothers Grimm and Hans Christian Andersen.

- Paramahansa Yogananda himself, raconteur par excellence and master teller of tall tales.

My interest in Breatharianism – Therese Neumann

It was at a tender age that I was first exposed to the concept of living without food or drink. For three years (grades 3, 4 and 5) at a Catholic primary school, I was subjected to a nun whose religious name was Sister Mary Gemma, after the late nineteenth and early twentieth century stigmatic saint, Gemma Galgani, hence the nun's interest in stigmata. We were frequently told stories about Therese Neumann, a living (at the time) stigmatic in Konnersreuth, Bavaria. Therese and her bleeding stigmata, streams of bloody tears and spectacular trances (especially turned on and up on Fridays, but with a crowd-pulling mega-performance in top gear and full flight on Good Friday) was an international tourist attraction. Crowds of pilgrims from all over the Catholic (and non-Catholic) world came streaming through her bedroom to watch the performance of her "sufferings" as she relived the Good Friday Passion. (An interesting point is that Therese was in fact born during the night between Good Friday and Easter Saturday, and therefore had a reason to identify with the Passion of Christ.)

To get to the point, Therese's main claim to fame, after her stigmata etc, was her alleged abstinence from food and drink for the last thirty-six years of her life, with the exception of a small Holy Communion wafer and a small spoonful of water to wash it down, administered to her daily by the parish priest, who was also her confessor, religious patron and leading fan. It would appear that in all that time, Therese was never actually caught eating or drinking by anyone outside her large family.

In his book *The Bleeding Mind*, the author Ian Wilson (of Turin Shroud fame) relates how the Catholic Church hierarchy, ever sceptical (they're good at something!) about claims of this nature, wanted to settle the matter once and for all, and obtained the reluctant permission of Therese and her family to conduct "a definitive test", consisting of a continuous observation period (a la Jasmuheen) of fifteen days to either verify or discount Therese's claimed ability to live without food or liquid.

One condition imposed by the Neumann family was that the observation and surveillance were to take place entirely in the Neumann family home, and not in a hospital. The vigil was carried out by a team of four fully qualified Franciscan nursing sisters, under the super-

vision of a doctor. The guidelines were strict, with at least two sisters to be with Therese at all times. The water she used to rinse her mouth was to be measured, as well as all excretions from her bowel and bladder. There were also repeated physical examinations.

Therese's weight, in chronological order at various times during the fifteen-day observation period, was 121 lbs, 112.5 lbs, 115 lbs and finally, on the fifteenth day, back up to 121 lbs. Her urine output was measured and chemically analysed both during the observation period and in the following fortnight. The results were quite revealing, being just what would be expected of complete fasting, with all the chemical indications of hunger after a period in which the body has been used to a normal intake of food. A telling feature was a high build-up of acids. However after the twenty-four hour surveillance conditions were over, the chemical analysis indicated a return to normal. More than a bit suspicious, one would have to conclude.


A credulous and syrupy biography, *Therese Neumann Mystic and Stigmatist* by Adalbert Albert Vogl, a long-standing friend of the Neumann family and proponent of Therese's beatification and eventual canonisation, contains the following interesting passage about events following her death. (The book recounts how she died on a Tuesday, the body was not embalmed, and the funeral was the following Saturday, with Konnersreuth experiencing a heat wave during that entire period.)

Before the coffin was closed on Saturday, the doctors made a final check of the insides of Therese's body and intestines for historical purposes. They inserted a long instrument and pierced her internal organs. There was no sign of decay, no sign of death, and the blood and tissues were as normal as in any living human being."

This statement is more interesting for what it didn't say than for what it did. If Therese really had not eaten or drunk for thirty-six years, and had had no excretions from her bladder or bowel during all that time, one would expect the bowel and bladder to have atrophied from disuse. Also, no mention was made of whether any trace of partially digested food was found in the intestines.

Although it is likely that her family colluded with her in a large-scale deception, at least in part because she created a lucrative tourist industry for the Neumann family, Therese was never caught committing dietary fraud. However there is an interesting account, also from *The Bleeding Mind* by Ian Wilson, of another Breatharian wannabe who was 'found out'.

... Skeptical glass from p 39

Lotto *disproves* any collective psychokinetic effect in this arena, and probably any individual PK effect as well. Hundreds of thousands of people urge the balls to come up with their favourite numbers, and since some numbers are more widely favoured than others more people are rooting for those each week. It hasn't made the slightest bit of difference to the frequencies of numbers tumbling from the randomiser. That's a win for knowledge, I'd have thought, especially if you're an open-minded skeptic by nature, as I am. 

Alfonsina Cottini – one who didn't get away with it

To quote from the book:

So was Therese a fraud, at least in respect of her food and drink intake? Within the last ten years there has been a deception of precisely this kind perpetrated by one Signorina Alfonsina Cottini from the tiny Alpine village of Craveggio, near Lake Maggiore, northern Italy. In her late sixties Alfonsina retired permanently to bed, letting it be known that she had abandoned all eating and drinking, and that all her bowel and bladder functions had stopped. She carried this off so convincingly that for ten years coach-loads of credulous pilgrims would come to see her reclining beatifically on her iron bed, surrounded by hundreds of photographs and other mementoes of her previous visitors.

Then stories began to circulate around Craveggio that Alfonsina's sister was amassing large sums of money, and that at night Alfonsina would get up, raid the fridge and perform the other necessities of life. The church authorities set up a special commission and found the village's darkest suspicions correct. Not least of their discoveries was that Alfonsina produced eliminations 'of a remarkable potency' ". (If you'll pardon the French, not only did she shit, but her shit stank!)

A possible source of the concept of living on light


In his book *Autobiography of a Yogi*, Paramahansa Yogananda has chapters dedicated to his meetings with both Therese Neumann and the non-eating Indian female "saint", Giri Bala. Therese reportedly told Yogananda that "I live by God's light ... One of the reasons I am here on earth today is to prove that man can live by God's invisible light, and not by food only." When asked if she could teach others to live without food, she replied "I cannot do that; God does not wish it." Jasmuheen, however, has no such compunction, and appears to have borrowed Therese's ideas and words for her book *Living on Light*.

Giri Bala – Indian non-eating "saint"

Yogananda met Giri Bala when she was sixty-eight, and she told him that since the age of twelve, a period of more than fifty-six years, she had neither eaten any food nor drunk any liquids. She allegedly accomplished this feat by employing a particular Kria yoga technique, involving the use of a certain mantra and a rather difficult breathing exercise, that enabled her to live without eating. Presumably, this technique is one from Patanjali's "Yoga Sutras", which also has "sutras" (cryptic aphorisms) telling the yoga student how to levitate, make himself bigger or smaller, walk through walls and even make himself invisible!

Conclusion to this eating biting article – why would anyone bother?

Personally, coming from a family of unreconstructed foodies, I find this idea of living without food a bit hard to swallow. I can't possibly imagine why anyone would be remotely tempted to adopt the Breatharian lifestyle, unless they have a morbid hatred of food shopping, cooking and/or washing dishes. (Okay, if the truth be known, I'm willing to admit that there are probably lots of people who could be described thus, but then there are always restaurants, takeaway and home delivered fast food for these people.) Of course, it would be a money saving way to live, but could you call it living?

Or could it be true that "Man does not live by bread alone"? (Matthew 4:4) 

Bob Steiner: Magician

Richard Cadena

This is the second in a series of four interviews I conducted early this year while visiting in the US. An interview with Bob Carroll was published in 19:3.

Bob Steiner is a CPA, professional magician, internationally known speaker and author in the fields of magic, critical thinking, medical quackery and confidence games. He is a Fellow of (CSICOP) and was National President of The Society of American Magicians. He can duplicate or explain virtually all of the popular cons.

Richard Cadena: Bob, I'd like to get your thoughts about the other people I will be interviewing. Michael Shermer?

Bob Steiner: Michael Shermer, of the *Skeptics Society* in Southern California. He is excellent; I've done some speaking down there. He is good people and very bright.

RC: Randi?

BS: I have worked with James Randi over the years on many matters. He brings wisdom, scientific knowledge, experience, tenacity, and wit to the investigation of paranormal claims. Never underestimate the power of wit in these matters. As Randi has pointed out: "One horse-laugh is worth a thousand syllogisms."

RC: When you came out to Australia in 1984 as Steve Terbot, I was wondering if anyone tried to contact you here in the US after you left, because you were psychic? [Bob Steiner posed as a psychic for several days before revealing he was a magician]

BS: No, but every once in a while, even to this day, I run across someone in an airplane who comes over and says "I know you, you were on television in Australia, your name was Steve Terbot. I know that isn't your real name but I don't remember what your real name is." (Laughing) Everyone remembers Steve Terbot, but once I became Bob Steiner everybody forgot me. That was fun. It was one of the most exciting things I have ever done.

RC: You often pose as a psychic and then explain that you are a magician, and everything the audience saw was done by normal means. How did you start that?

BS: Originally, I was a lone Skeptic. A lot of Skeptics are that way, then they find out there are other people who think the same way. A professor at Iowa State University, Jack Patterson, helped me start visiting universities talking about psychic powers. I still do that occasionally. I am introduced as a psychic and I convince the overwhelming portion of the student body and a fair portion of the faculty that I am in-

deed psychic. I then explain that it is a trick. When they say, "No, it can't be because of this or that." I say, "No, no, that just means it is a very good trick (laughing)."

RC: Bob, given your experience as a "psychic" what is something you have learned about them?

BS: Psychics claim that their power works everywhere but there are definitely four places where it does not work. One, is at the racetrack. Two, is at the gaming tables or lottery.

The third is in the stock market and of course the fourth is in a scientific laboratory. It works everywhere else. Although they sometimes claim it doesn't work in the presence of a Skeptic.

RC: You have involvement with CSICOP. How did that come about and what have you done with CSICOP?

BS: Well, Jack Patterson referred me to the chair of the Education sub-committee of CSICOP and I was appointed to that sub-committee. I am now a CSICOP Fellow. I gave two presentations at the CSICOP Conference in San Francisco, September 1997:

"ESP - A Demonstration" and "Psychic Surgery and Other Medical Quackery, including Healing."

F a i t h

In reaction to the above, Barry Karr, Executive Director of CSICOP, wrote: "If you are looking for a way to enliven your conference, meeting, or seminar, I can think of no better way than to invite Bob Steiner along to surprise, stun, educate, and thoroughly entertain your participants. Whether he is discussing scams and hoaxes, medical quackery, the paranormal, or simply blowing your mind with his talents as a magician, you will walk away totally happy and more than a bit wiser."

RC: Interesting you should mention conferences, as Australia is hosting the World Skeptical Congress in 2000. Any chance you might return to Australia for that?

BS: I would love to. Can you put me on the program?

RC: I'll definitely talk to people about that. Now, the other area you deal in is confidence games or cons as they are sometimes called. How did that start?

BS: I had moved to California and was a founder of the Bay Area Skeptics in 1982. At one point someone referred me to the police. I did a major research into the police and I learned how to do the cons then. I was able to con the police, which was fun.

RC: Were they appreciative?



Bob Steiner, magician

BS: Oh yes. Although, I was concerned about that. There were two things that troubled me. One, would I be able to con them and secondly, if I did, would they be upset? After all, their egos would be on the line but they got into pretending that they were members of the public trying to beat me at the games. They did try to take me but I beat them. Which was good. (laughing)

RC: You have even written a book about cons that would be interest to all people not just Skeptics.

BS: Yes, the name of the book is *Don't Get Taken!* It covers cons and scams and discusses ways people can protect themselves. Recently I gave two presentations at the 1999 Professionals Against Confidence Crime Seminar, so I keep involved in the cons and scams arena.

RC: Shifting to pseudoscience in general, if you could somehow eliminate one stream of pseudoscience, let's say everyone suddenly realised that crystals didn't heal, which one would you eliminate?

BS: Rather than a particular pseudoscience, I would eliminate the general belief that most of your life is directed by mystical forces. You have substantial control over your own life and when you block that out and look to other forces to save you, you are in deep trouble. You're blocking reality.

RC: Put another way, is there one area of pseudoscience that 'annoys' you most?

BS: It is hard to pick one. It is the idea that there are mystical forces. If people accept that, then for me to pick one of the mystical forces and take that away from them will result in their just finding a different mystical force to believe in. That doesn't solve the problem, that doesn't even help the person. If you have a person who believes in astrology and you wave your magic wand and take away astrology, which was your original question, then they will go to the blood readers.

RC: The blood readers?

BS: You are your blood type. Your blood type determines your personality. What is in your veins has more to do with your personality than what is in the stars. It is so absurd. One statement they make is wonderful; "Most of the big Mafioso are type O". Now O is the most common type but putting that aside, how would you find that out? Do you write letters? "Dear Mr Smith, It has come to our attention that you are a member of the Mafia and an important member as well. Please answer these four questions." COME ON, where do they get these figures?

To get back to your questions, if I could eliminate all belief in astrology, these are true believers who would find a belief. Just as a disaffected lover would fall in love on the rebound. They are lovers without a love object so they are lovers scouting around for love objects. The believer would have a belief in astrology gone, so they would go around and find a belief. So for me to take one belief away won't solve anything. I want them to realise that they have more control over their own lives than they now believe.

RC: You've been in the Skeptic 'business', if I can call it that, for a long time. How do you avoid the frustration when you see the increase in pseudoscience?

BS: You're assuming that I've avoided being frustrated (laughing). Every once in awhile it gets to me but I do see when I win people over. I do see where I get breakthroughs. I get more satisfaction from doing presentations in high schools and colleges. There the people are young enough to not be locked in. They don't have a lifetime of commitment that they have to stay with.

RC: You have a great story of a time you fooled the skeptics. Could you speak about that because it is a good example of why we should be skeptical of even famous Skeptics?

BS: It was at a CSICOP conference; at night during a magic show and I had been introduced as a magician. I mentioned Clever Hans the horse. Do you know about Clever Hans?

RC: Yes, but tell our readers.

BS: Clever Hans was a horse whose owner thought he could cipher. This was around the turn of the last century. You would say to Hans, "How much is three plus two?" and Hans would stomp his hoof five times. Scientists came around and thought the owner was signalling him. So they moved the owner behind the horse. They even took the owner out of the barn. The horse could still do it. Finally, a psychologist by the name of Oskar Pfungst came up with the answer. The horse could read body language. The questioner would relax when the horse got to the correct answer and when the horse noticed the relaxation it would stop stomping. A brilliant horse. He couldn't cipher but he could read body language.

At the CSICOP conference, I said, "If a horse can do it I can do it!" So I shuffled a deck of cards and had three people each chose one card and then place it back in the deck. I then asked them to stand up as I went through the deck calling out the names of the cards. I told them, "When I call your card, DO NOT react". I will try to pick up your body language in spite of your trying not to react. I then called out the cards as fast as possible. I then named the three cards correctly.

This was written up in a major newspaper, mentioning that I had been able to pick up on body language that no one else could. I couldn't let that go so I wrote an article, published in the *Skeptical Inquirer*, titled "Confessions of a Magician". I said, "It appears I pulled off the ultimate magic trick. It was billed as a magic show, I was introduced as a magician and everybody believed it was NOT magic."

We chide the believers, we say they would rather call something psychic than to say they don't know. They don't want to admit they have been fooled. What about the Skeptics, I timed myself: I called out the entire deck in less than 14 seconds. That is time-spans of less than one quarter of one second per card. Could the three people have heard, understood and reacted in clearly discernible body language in that time? Could I have picked this up with pinpoint accuracy from three people standing in a room of 800 people?"

My conclusion was that if I had told the audience that I was psychic they would not have believed me. However, it appears that the assembled skeptics were more willing to believe that I am a horse than that they were fooled by a magician.

RC: Yes, it is interesting that Skeptics will quickly spot an improbable event that has a paranormal explanation but not notice an equally improbable event that

Continued on next page ...

I am not a giraffe, and I can prove it

Bob Steiner

It keeps coming back like a bad penny. I have seen it over and over in skeptical writing, and have heard it from skeptical speakers. A Skeptic will present a persuasive, logical case why one should not believe in the paranormal: lack of credible evidence, the appearance can be duplicated by normal means, and the like.

Then a parapsychologist will say - correctly, "The fact that a magician can duplicate the appearance of this claimed paranormal event does not prove that the psychic did not do it psychically."

The Skeptic will step into the trap by replying, "That is true," then hasten to add, "but you cannot prove a negative."

I have not seen it yet, but the day will come when some astute parapsychologist will *prove* to the audience that one can indeed prove a negative. Thence, having captured the *merited* respect of the audience on that one point, the parapsychologist will extrapolate and will successfully convince the audience that the Skeptic has no credibility and should not be believed on anything else said. All of this because the Skeptic made a strong, all-inclusive, universal assertion - and it was wrong!

I have on my desk *The Encyclopedia of the Paranormal*, edited by Gordon Stein (published by Prometheus Books, Amherst, New York, 1986).

In one otherwise well-written essay, the author concludes with:

It would seem that with all the evidence of trickery we should come to the conclusion that PK-MB [psychokinetic/metal-bending] is nothing more than a myth, skilled magicians using their five normal senses to create the illusion of reality. The problem is that it is impossible to prove a negative.

In a letter to the editor in the July / August 1995 *Mensa Bulletin* [Fort Worth, TX. America Mensa, Ltd.], a writer attempts to nail down his point by invoking this all-inclusive, erroneous generalisation. The particular topic at issue in the letter is less important than the flaw in philosophical reasoning by an otherwise logical writer:

Not only is the [person who does not believe] under no obligation to do anything, [but] it's impossible for him to prove that [the topic at issue] has no existence. This is due to that ironclad logical rule that says, "One cannot prove a negative."

In writing and discussion, it is sometimes appropriate to explain the difficulty (or even the impossibility)

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has a technical explanation. Something for us all to be wary of. Now, what was the joke you wanted to tell before we end?

BS: Did you hear about the homoeopathic patient who forgot to take his medicine and died of an overdose?

RC: Bob, (laughing) thanks for your time.



of proving *some* negatives. It is an unjustifiable stretch to jump to the universal declaration that "it is impossible to prove a negative."

We must consider the precision of the definitions, the size of the item for which we seek proof, the size of the universe in which this item is supposed to exist, as well as other considerations.

For example, suppose someone says: "I believe that unicorns exist. Although I cannot prove it, you cannot prove that they do not exist. So we must keep an open mind about the subject."

The problems: We would have to agree on a precise definition of *unicorn*. Next we would have to determine how to test and validate it.

Even after we do that, it would still be impossible to prove that there is not even a single unicorn anywhere in the universe.

What I hold about unicorns is not a disbelief. Rather, it is the absence of belief. I am a Skeptic--an unbeliever. Try *unbeliever*: it is a wonderful word.

When someone brings up "the open mind argument," I have a ready answer:

I do have an open mind. I am willing to evaluate your evidence. I am further willing to revise my beliefs - even my worldview - as soon as there is credible evidence presented.

Until such credible evidence is presented, I shall live my life as if it does not exist. I have the absence of belief, not a disbelief. Surely you would not want me to believe that there is an invisible dinosaur standing between us ... would you?

You have made the claim. The burden of proof is on you. It is not my obligation to prove that unicorns do not exist.

The concept that the burden of proof is on the one making the claim is one of the most powerful arguments in the Skeptic's arsenal. If you make a counterclaim - for example, it is impossible to prove a negative - the burden of proof shifts back onto you. Don't get caught in that trap.

I mentioned the size of the object and size of the universe in which we seek the object. It would be far easier for me to prove that there *is not* a hippopotamus in my living room than to prove that there *is* a specifically designated virus germ in the room. Thus, in this case, it is easier to prove a negative than a positive. It is easier to prove *some* negatives than it is to prove *some* positives.

And now to summarise that one can indeed prove a negative:

I can prove that the world is not flat, that there cannot be an undiscovered continent on Earth larger than North America, that there is not an elephant in my living room, that I am not a woman, that two parts of hydrogen plus one part of oxygen do not produce sulphuric acid, and that I am not a giraffe!



Those funster actuaries

Richard Lead

Actuaries are a bright bunch. By definition, they must be fiercely good at mathematics and, despite their taciturn reputations, they can often be the life of any party which serves tea and lamingtons. Sadly, some genetic defect renders them unsuited to the daily thrusting passions of accountancy.

In August 1999 the Australian Government Actuary emerged from the arcane world of heteroskedastic disturbances and autocorrelated residuals and released a new set of Australian Life Tables, the 1995-97 series. The life tables set out our life expectancy at each birthday, and are used by insurance companies to determine life insurance premiums, superannuation pensions, and other fun stuff.

The 1995-97 tables are the fifteenth in the series of official Australian Life Tables. The first series dates back to 1881, and a side-by-side comparison is thought provoking.

One of the outstanding features of the outstanding 20th Century is the increase in our life expectancy. Since 1891 male life expectancy has grown by over 28 years, mainly due to the scientific advances which have largely banished fatal childhood diseases. It seems incredible



The author caught ingesting a life-enhancing elixir.

had a life expectancy of 25.73 years according to the 1977 Tables. By 1992 the life expectancy of a 48 year old male had steadily grown to 29.27 years, and the latest 1997 actuarial calculations give a male of that vintage a projected future of 30.46 years. In just 20 short years the moving feast of 48 year old males had 18.4% added to their life expectancy, a feat almost certainly never previously achieved in the peacetime history of our species.

To what can we attribute this amazing improvement? No doubt there are hundreds of factors, ranging from more crashworthy cars through to reduced smoking, but does any reader believe it is not the huge advances in medical science which can rightly claim the bulk of the credit? Science has improved our health and longevity, and to all you scientists out there, a hearty well done.

And yet, how have we responded to this improvement? Arguably, by becoming the most hypochondriac generation in history. Many people refuse to drink tap water, and instead opt for expensive bottled water.

I can't be the only subscriber to *the Skeptic* who has noticed what Evian reads when spelled

backwards. And what about the widespread fear of mobile phones! These battery powered devices are allegedly so dangerous many people use an external microphone to keep them away from their head – and chat happily away with these cancer-causing, radiation-emitting instruments held close to their genitals.

Our grandparents would no doubt be suitably unimpressed by our silly fears.

The captioned summary of the fifteen Australian Life Tables reveals some intriguing numbers. A male child born in 1881 had a life expectancy of just 47.2 years. He had a 13.25 percent chance of not seeing his first birthday. A male

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Series	Life Expect Age 0 (Male)	% Chance of Dying Within 1 Year	Life Expect Age 65 (Male)	% Chance of Dying Within 1 Year
1881-90	47.20	13.25	11.06	4.58
1891-00	51.08	11.84	11.25	4.50
1901-10	55.20	9.51	11.31	3.86
1920-22	59.15	7.13	12.01	3.55
1932-34	63.48	4.54	12.40	3.31
1946-48	66.07	3.20	12.25	3.53
1953-55	67.14	2.52	12.33	3.41
1960-62	67.92	2.24	12.47	3.45
1965-67	67.63	2.09	12.16	3.60
1970-72	68.10	1.95	12.37	3.47
1975-77	69.56	1.50	13.13	3.07
1980-82	71.23	1.15	13.80	2.67
1985-87	72.74	1.03	14.60	2.35
1990-92	74.32	0.81	15.41	2.06
1995-97	75.69	0.61	16.21	1.76

But the Life Tables show these life expectancy gains are not solely due to improved childhood mortality. Take the life expectancy of the writer, a sprightly 48 (and in superb shape - for a man of 65). A 48 year old male

A moaning and gnashing of teeth

Ruth Pihl

I grew up in the evangelical tradition where the fear of hell hung over us like a pall of smoke, obscuring the light. Well, now they – some theologians and churchmen (rarely women) – tell us that hell mightn't be all it's made out to be. In fact, it mightn't be there at all.

I must admit I've always had a bit of a problem with afterlife theories. The Buddhist reincarnation ones were probably the first to go, not only because they're too foreign for Australians, and have something to do with not treading on ants, but also because they doesn't easily gel with the Malthusian theory of population growth.

The Christian myths, on the other, hold out a hope of having another go at the end of this flesh and blood existence. Heaven is an agreeable myth for the agreeably worthy but, when you look into it, it becomes rather elitist and far-fetched. Throughout history it was reached not only by saintliness and good works, but by payment of indulgences, the prayers of the pious and, anyone, no matter how grotesque and inhuman, if they were keepers of the faith or last minute penitents. Up there, on adjoining clouds, might be the long-suffering poor, the road accident victim and the murderer who embraces the faith as the noose tightens around his neck.

Then there are those once human souls up there in *Never Never land*, Limbo and Purgatory, which always struck me as a tad silly. Lost souls in lifts, stuck in a heavenly elevator between the 'up' to a glorious heaven and the 'down' to the bargain basement of life – the fires of hell. To get the lift moving again, and hopefully towards the top, you had to provide all sorts of holy contortions, inducements and invocations in an effort to persuade the powers to be that one's dearly beloved stuck-one is deserving of moving in the right direction. Of course Protestants didn't get stuck in these places, probably because they were unlikely to qualify for the elevator in the first place.

Now, some of our bright sparks (excuse the pun) tell us with a gasp of inventive genius, that Hell could be right here with us on earth. As if we didn't already know it. Who could dispute any hell-on-earth theory when there's plenty of evidence around to confirm it?

To add extra confusion to the pew-sitters, the Archbishop of Canterbury informs us that there is no absolute proof of the Resurrection. The historical Christ seems to be accepted, as is his ultimate death at the hands of religious bigots (and aren't they still around). What is a little dodgy is the 'rising again.' How can we be believers, if the basis of this 'belief' is changing. What are believers supposed to believe?

Here we Skeptics, along with atheists, agnostics and all those others who are euphemistically lumped together under the heading 'heretics' and 'unbelievers' will be saying *told you so*. Belief without evidence is proclaimed as 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 have never been

really good at this, and it seems to have been a big problem to others throughout the centuries. Just ask Galileo.

In one of my favourite books, Umberto Eco's *The Name of the Rose*, he discusses the problems faced by Benedictine monks charged with copying and preserving valuable, ancient illuminated texts. To do this successfully they are not to read or know or understand what's in them. To do so would invoke pride and that's sinful. Holy wars, heresy, blasphemy, papal intrigues and plots, wholesale slaughter of innocent populations (God, Eco's character tells us, will be able to recognize and extract his own from the slaughtered) are perpetrated everywhere in order to maintain, preserve and keep the word of God. And God, it seems, is never present to intercede. In fact, apart from regular attendances at human goings-on in the early bit of the Old Testament, He keeps right out of man's follies and brutalities, even though they are often perpetrated in His name. Unlike the cavalry we expect to turn up at the last minute in every good Western, God merely looks on. This happens, Christians tell us, because we've got a free will.

Eco, in the final pages of his wonderful book, speaks through his character William ...

It's hard to accept the idea that there cannot be an order in the universe because it would offend the free will of God and His omnipotence. So the freedom of God is our condemnation, or at least the condemnation of our pride.

I dared, for the first and last time in my life, to express a theological conclusion. 'But how can a necessary being exist totally polluted with the possible? What difference is there, then, between God and primogenital chaos? Isn't confirming God's absolute omnipotence and His absolute freedom with regard to His own choices tantamount to demonstrating that God does not exist.

And do you remember, as I do reading the scene in James Joyce's *Portrait of the Artist as a Young Man* where his clerical instructor in 'divinity', in order to prod reluctant young men into a vocation in the church, proceeds to scare the pants off these callow youths in order to terrify them into doing God's work? Maybe this sort of theological thuggery worked in the past, but it seems to have had its day as once-dedicated students leave the seminaries in droves, and few are recruited to take their places.

Despite the resultant crisis in numbers, women don't seem to be getting any closer to filling the gaps, with biblical dogma and nasty, sexist rules still trotted out to keep the girls in their place. Christ didn't have women disciples, they point out. Neither can I recall anywhere in the scriptures where he told Peter to organize his church into a hierarchical men's club with someone called a Pope at the top.

The status quo, in the Catholic church at least, has hardly had a nudge in centuries, in spite of the fact of



During a recent trip to the USA, Richard Lead took time to visit CSICOP at Buffalo, NY. He was taken on a tour of the Center for Inquiry by Prof Paul Kurtz and met many of the 35 staff employed by CSICOP. Richard was most impressed by the Center's library and facilities. Richard is seen at the Center with Paul Kurtz, Joe Nickell (Investigator) and Barry Karr (Executive Officer).

... moaning from previous page

church attendances remaining two-thirds female. Women hold the faith but not the reins, stuck in the role of being handmaidens to ungrateful, inflexible men. It begs the question, why stay? I didn't. It will also be interesting for historians in the not-too-distant future to note whether churchmen let down the cathedral drawbridge to women before a fatally disillusioned laity gives the whole lot away.

Despite the above, it will be rather a pity to see Hell disappear as a concept if not as a reality. Fear of hell has always been a far greater impetus to goodness than, as Howard's preamble to the forthcoming Constitution puts it, *hope of God*.

I rather like all those great stories about selling one's soul for eternal life – or a type of life. The to-ing and fro-ing of God and the Devil battling for the immortal souls of man make great theatre. And, even in the soaps, you can nod with righteous indignation that God will sort out the errant husband who appeared to get away with his crimes as the final advertisements bring the program to a close. And what will happen to those Christians who have placed their moral remains not in a tomb being watched over by a concrete guardian angel, but in a deep-frozen time capsule waiting for purgatory to end and for them to be released into the splendour of yet another human existence? Hardly an affirmation of faith to seek, at great expense, another go at this end.

So much for this Sunday afternoon speculation. Time to get out in the cold, windy garden and do something useful. Boy, it's hell out there.

... actuaries from p 45

child born today can look forward to 75.69 years, with only a 0.61% chance of dying before his first birthday. It is perhaps only a coincidence that the decline in religious beliefs has paralleled the increased longevity of the population.

The improvement in life expectancy of sixty five year old males has not been so pronounced, increasing by just over 5 years since 1881. Interestingly, the chance of a male dying in his first year of life was greater than his grandfather dying in his sixty-fifth year of life until as recently as 1946.

Now, if the noble editor will indulge me yet again I will jump onto one of my hobby horses. In 1901 the Australian Government introduced a world's first – a universal aged pension for men aged 65. In 1901 the life expectancy of a male child was just 55.2 years, and only 48.7% of males born in that year were expected to reach age 65. Today the life expectancy of a male is 75.69 years, and fully 82.8% of males born in 1999 will reach age 65. Any of our younger readers (those still on the immature side of 50) who believe Australia will be able to afford to pay them a pension when they hit 65, and they accordingly don't need to invest for their own retirement, should reserve their favourite park bench now to avoid the rush.

The words 'mortality risk' have an obvious meaning to all readers – the risk of dying during a particular period, or while performing some dangerous act. In my world the words 'mortality risk' have a far more serious meaning – the risk that a client's money will die before the client does.



Random musings of an innocent abroad

Barry Williams

I save the world

As one of the last generation of Australians to have been taught that London was the capital of an empire upon which the Sun never set, it was with joyous heart, Gentle Reader, that I set forth from Sydney on August 12 to visit that fabled metropolis and its hinterland.

The day I set off was one brimming with auspices and it was not lost on me that my course across half the planet would be an almost exact reciprocal of the path of the total eclipse of the Sun on the morning of August 11. What good fortune, I mused, that my powerful Skeptical negative energies would cancel this malign influence from the heavens, one that many had averred would mean the end of civilisation as we know it. Can there be any doubt that the Nobel Committee in Stockholm is even now planning to merge all the science prizes with the Peace Prize, and thus save on the cost of gold medals? This time I'll fly to Europe First Class.

The great wen

First impression of the great metropolis is that London is a short city, the occasional skyscraper standing out much more than they do at home; but the sense of history is omnipresent, with names and places that resonate from all the cultural baggage we carry, not to mention the Monopoly board. St Pauls, Trafalgar Square, (Nelson, lonely atop his column) St Pancras Station (instant love affair with its extravagant architecture), Piccadilly Circus (not an elephant in sight), Westminster Abbey, the Albert Memorial (recently renovated, gleaming in its new gilt sheathing and looking like nothing more than a great Victorian space ship). (Can I be the only tourist ever to visit London who didn't even catch a glimpse of Buckingham Palace?) Blue plaques on walls denoting historical connections: here Charles I stepped through a window to meet his fate; there Charles Darwin lived for a few of his early years. Monuments are smaller in reality than in imagi-

nation, the singular exception being the Palace of Westminster (Houses of Parliament), its gothic splendour somewhat offset by the colourful striped awnings along the riverside terraces.

As expected, funny taxis and double decker red buses everywhere. Curiously, the upper decks of these buses seem to be inhabited solely by Australians and people speaking French. Where are all the "friendly Bobbies"? Mainly in candy striped cars hurtling around the streets with klaxons blaring. Total seen on foot in one week? Seven. And where are all the Londoners? Not on the streets, where every accent on Earth can be heard, except Cockney. We get more requests for directions in a week than we would encounter in a year in Sydney. Into a pub - the owner is Irish, the barman from Auckland, the cook from Capetown; barman on the next shift is from Melbourne, but the beer is crook and we don't wait around.

We are later told that 70% of the staff in British pubs are Australians, South Africans or New Zealanders. It is also apparent that no one living in London is more than a five minute stagger from a pub.

The British Museum, culmination of a life-long yearning. What's this? The famed Greek portico overshadowed by a large red building crane. The BM is undergoing renovations and part of it is closed. No chance to see the famous Reading Room (we later learn it has moved). But the Egyptian gallery is open and we wander through in awe, under the benign gazes of their late, great, majesties Amenophis III and Rameses II; the Rosetta Stone, close enough to touch (though we don't).

Next to the Assyrians and the great gates of Nimrod; on to Elgin's Marbles in a new setting - it's all too much to take in.

The Science Museum. Every technological marvel from the Industrial Revolution to the Space Age. An exhibition of Babbage's calculating machines (original and replica), caught the eye and the imagination. Remarkable craftsmanship and what a pity we chose to



Assyrian human-headed winged lion and friend. Or is it a relative?



The author with a group of British Skeptics.

call their electronic descendants computers, and didn't stick with the poetry of, analytical and difference engines, as Babbage called them.

A serendipitous bus trip through rain-damp, uninspiring suburbs, then rounding a corner just as the sun breaks through and there lies Greenwich, home of 0 longitude. *Cutty Sark*, firmly attached to the shore but still with the air of a greyhound straining at the slips, *Gypsy Moth IV*, altogether a more utilitarian craft. The RN Museum, the old Observatory, but we arrive in late afternoon and everything is closed. Across the river the grotesque bulk of the Millennium Dome looms large and incongruous.

A pilgrimage to Lords. No match that day, but a visit to the shop to get some souvenirs; a gap between the Edrich and Compton Stands reveals tantalising glimpses of green. Dare we stroll through? Of course we dare and there it is, the sacred turf of the home of cricket. Also the uniformed figure of a security guard. No venture, no gain, we think, putting on the aspect of dumb colonial tourist. "We've come a long way. Can we just have a look?" "No problems mate, as long as you don't walk on the grass." Somewhat non-plussed we ask, "Where are you from?" "Brisbane" he replies.

To the Florence Nightingale Pub (what this lifelong teetotaler would have thought about having a pub named after her is something only a spirit medium could discover), hard by Waterloo Station, to give a talk to a group of British Skeptics. Fill them with thoughts of attending the antipodean World Skeptics Convention in November 2000, when the weather in Britain will not be as pleasant as it is in August. (Could I be the only Oz ever to get sunburnt while sightseeing in London?) The natives are friendly, so I try my philosopher's joke. "I was walking past University College yesterday" I explain, "when I was reminded that this is where the preserved remains of Jeremy Bentham are on public display. It occurred to me that Bentham was the only philosopher to achieve what all philosophers should strive for - he went and got stuffed." They laugh - wonderful sense of humour the British.

"When a man is tired of London, he is tired of life" said Dr Johnson. We're not tired of it, there remains so much left unseen, but time is short and there is much else to see, so we press on.

Onwards and upwards

Northwards towards Cambridge, but a detour takes in the Imperial War Museum display at Duxford. This famous WWII fighter station houses a collection that makes an old aeroplane buff drool. As



Anthony Garrett under sign proclaiming the discovery of the electron by J J Thomson.

we park, we hear the unmistakeable growl of a Merlin engine under power as the sun breaks through the clouds. A Spitfire is taking off, to be followed by a Mustang, Kittyhawk, Messerschmidt 109 and a Corsair. They are practising for a Battle of Britain display the following week. Nirvana.

On to Grantchester, on the outskirts of Cambridge, where we stay the night in a 16th Century thatch-roofed house, with former Oz Skeptic, Anthony Garrett. Only 100 metres from the house is a famous church, about which local identity, WWI poet Rupert "there is a corner of a foreign field that is forever England" Brooke wrote "Stands the church clock at ten to three, and is there honey still for tea?" Anthony advises that the clock, being broken, had indeed

stood at ten to three for many years. However, it must have since been fixed, as witnessed by the photograph.

Cambridge, stamping ground of princes, prelates, poets and homosexual traitors. A tour of some of the famous colleges Caius (pronounced keys), Magdalen (pronounced maudlin), Trinity (pronounced Ponsomby perhaps - don't these people speak English?) The majestic architecture of the colleges and their chapels inspire, but a different sort of inspiration comes from a small cluster of undistinguished buildings taking up little more space than half a dozen suburban building blocks. The old Cavendish Laboratory - here a plaque commemorating the discovery of the electron by J J Thomson in 1897; there one showing where Watson and Crick teased out the secrets of DNA in



Watson & Crick plaque at the old Cavendish

1953; nearby, the place where Rutherford split the atom. There is a new Cavendish, out of town and some of the old buildings are being used as the University's computer centre, but much of the history of 20th Century science was written in this small, nondescript, precinct and its ambience is every bit as powerful as that of the soaring tower of King's College Chapel, nearby.

In Cambridge a notion, gestated in London, began to take on form - the all-embracing love of the English for their dogs. In the metropolis we noticed far more dogs (well curbed) on the streets (well kerbed) than would be apparent at home, but it was on the tranquil reaches of the Cam that the notion began to take on substance. There, sitting in a large punt, awaiting more passengers, sat two gentlemen, flanking a large golden Labrador. There will be more on this canine obsession in the next chapter of these reminiscences, along with such revelations as "Antipodean Traveller Stricken by Loch Ness Curse" and "Crop Circles: the Truth Revealed at Last", but for now, we must draw this journal to a close.



Church clock standing at 12 past 8. Honey status unknown.



Skeptic sees Madonna and Child at Yankalilla!

Steve Roberts

Yes it's true! The only problem is, I saw the baby in a different position to what the propaganda at the site says it's in. Perhaps I'm not in favour with the big G this week.

Yankalilla is a sweet little town at the foot of the Fleurieu Peninsula. It already had many touristic attractions before somebody spotted the bodgy plastering on the wall of one of its churches. The town bakery does a nice line in cakes.

Most of the denizens of the town are somewhat embarrassed to find themselves hosting the world's newest Marian shrine. Imagine the amazement of the Anglican priest upon contemplating the bodgy plastering to the right of the altar on the back wall of his church? Maybe that could be a woman with head bent over and a baby, if you look at it in a certain way - so maybe further, it's Mary and Jesus. Official photos show the baby in a sort of vertical position, not a very good way to hold a baby - I saw the baby as more horizontal, which is how I used to hold mine (so maybe it's me and my daughter on the wall).

In a letter pasted up in the porch the Bishop says he's impressed with the image, although he sees it as an Aborigine with a dead man. A prominent local helper at the church said the image had now changed, and it's Mary with the dead Jesus removed from the Cross. Mary is looking not at the body, but over to our right towards the place in the church where the sacraments are stored ... thus reading the wall from left to right, the message for us is that Christ was born, died and has risen. (What about people who read from right to left?) Bit of a wasted opportunity really - humanity already knows this message - it's in a well-known book. There is a frame on the wall which, she explained with laser pointer, helps you to pick out the right image from the chaos. The frame



The author: plastered on altar wine?

also serves to exclude some more bad plastering which otherwise would mess up the whole thing. If you include all the bad plastering, then it looks like much more like a scrum of rugby players. I tried to explain what I could see - "Can I borrow the laser pointer?" - "No".

The town has two old stone churches - Anglican and Uniting, and a somewhat bigger brick barn for the Assembly of God. The nearest Catholic church is in nearby Normanville. The Virgin has appeared on the wall of the wrong church - but never mind, now it's too late.

The church has become a shrine for those desperate for help - one wall being covered with prayers for all sorts of causes that the Virgin could help with, including passing exams (mental note: don't employ this person). At the back of the church a "grotto of St Francis" has appeared. This is built on exposed level ground and has a statue of St F with kangaroo, emu, wallaby and other local fauna. I reckon he's in the wrong place too.

A new bore has been sunk behind the church to pick up holy water - on the banks of a particularly overgrown and sheep-y creek. I shudder to think how safe the "holy water" is - or is it just tap water? If homeopathically diluted it would be safer - come to think of it the actual underground stream must come out somewhere anyway. The church now also has a "Jesuswindow" at the front, at which people strain really hard to see ghost images (and you can pop up behind the window at such times - in rather poor taste, really).

The congregation is very disturbed by all this and have twice passed resolutions that sack the priest. However the priest is not obliged to follow such resolutions ... ah, democracy!!



Rough plaster. All in the eye of the beholder?



Cannibalism lives

Richard Buchhorn

The notion of cannibalism is like an insidious recurring virus, its ability to manipulate the reasoning of those infected often unrecognised. This was evident in the media coverage and debate generated by the April 1997 publication of the book *Pauline Hanson: The Truth*, which focused primarily on the chapter supporting her earlier remarks about Aboriginal cannibalism: "Will the descendants of those blacks who cannibalised Chinese miners on the Palmer River in 1875 be required to bear the guilt of their forefathers?" (*The Courier-Mail*, 29/5/96).

Those Skeptics fortunate enough to have subscribed to this publication for six years, and to have read my article "A Taste for Chinese?" (14:1) would have been bemused and well equipped to enter that debate. For the benefit of others, and those without access to it on The Net (<http://www.skeptics.com.au/journal/canib-chinese.htm>) let me outline the substance of that article. It pointed out that, taking North Queensland, for example, among all the reports and inquests for some 350 deaths up to 1897, there is no credible evidence of even one European or Chinese miner having been eaten by Aboriginal people. Detailed inquest papers expose as fabrications the escalating gruesome details alleging cannibalism in popular accounts of some of those deaths.

Did they eat one another? As far as the handful of purported eyewitness accounts go, I outlined the explanation advanced by Michael Pickering in his 1985 ANU thesis, *Cannibalism amongst Aborigines: A Critical Review of the Literary Evidence*. He suggests that the pre-conception of Aboriginal people as cannibals, together with fear and fertile imagination, coloured incomplete observations of burial rituals and cremations. These led to the exaggeration, distortion and fabrication of evidence, and turned suspicions into assertions.

Perhaps there have been incidents of cannibalism, other than those of survival cannibalism, common to many countries. But one swallow does not a summer make: to base the allegation of Aboriginal cannibalism on one or two examples would justify using the cases of Gary Heidnick (1987) and Jeff Dahmer (1991) to describe Americans as cannibals. The difficulties in trying to prove a negative - that something didn't happen - are well known.

The role of such myths in justifying the process and brutality of colonisation has long been recognised. The Australian scholar Gilbert Murray, Professor at both Oxford and Harvard in the early part of this century, put it well: "Unnatural affection, child-murder, father-murder, incest and the violation of dead bodies - when one reads such a list of charges against any tribe or nation, either in ancient or modern times, one can hardly help concluding that somebody wanted to annex their land."

I now take up my pen/word-processor once more to stake out a claim for the Skeptics Eureka Prize for Critical Thinking - awarded for "critical investigations of popular acceptance of beliefs that owe little or nothing to the rigours of scientific method". In this update, I invite Skeptics to consider the pertinacity of the myth, and the role it continues to play: how that reflects on non-Aboriginal Australia; and its relevance to the task of owning our history in this land.

Over the last decade, as part of my ongoing research on this topic, I have continued to contact and challenge authors who allege Aboriginal cannibalism, to ask for evidence and sources, and to then - where possible - check them out. As well as the odd contribution to talk-back radio, my letters to the editor have had a good strike rate. They have contributed to my being described by an editor of a Brisbane newspaper as "an obsessive and vexatious writer", a title I wear with pride.

All this activity intensified during the widespread debate generated by the publication of *Pauline Hanson: The Truth*.

The Hanson debate

There were positive aspects to the debate. Both *The Australian* (23/4/97) and *The Age* (29/4/97) ran feature articles which reflected the findings of anthropologists like William Arens (*The Man-eating Myth*, OUP, 1979): that while most peoples have at some time been accused of cannibalism by people on the other side of a geographic or social divide, there is no compelling evidence that the eating of human flesh as food has ever been an approved customary practice in any society. And that includes the indigenous people of this land. They raised the questions that need to be asked, about people's fascination with the notion of cannibalism, and the origins, uses and persistence.

In contrast, *The Sydney Morning Herald* (23/4/97) ran a feature article by an older anthropologist Kenneth Maddock, citing pre-1978 sources, and showing no awareness of later research. For his claim that "forms of cannibalism are .. well attested in Australia" he relied primarily on Ronald & Catherine Berndt's *The World of the first Australians* first published in 1964. He then suggested that, by reissuing the book, the Australian Institute of Aboriginal and Islander Studies had recently endorsed the Berndts' views. But he ignored the entry on cannibalism in the Institute's *Encyclopaedia of Aboriginal Australia* (1994), which describes evidence for the practice as "fragmentary, inconsistent and inconclusive".

Also on the negative side were the allegations of Aboriginal cannibalism, often supported by baseless and discredited stories, which poured out of the dark recesses of many minds into letters to editors and the microphones of talk-back radio. Many of these came

with conviction akin to that manifested by believers in alien abductions and 6,000 year old Earth: and with a stridency suggesting a psychological dependence on the myth, and reliance on it to justify hostility and attitudes of superiority towards Aboriginal people. People challenging the myth were dismissed as the chattering class, defending the myth of the noble savage, akin to Holocaust deniers, and as part of an international conspiracy to suppress stories of cannibalism.

Diversions arguments

Some participants in the debate, including respected academics and leader writers, offered life lines to those anxious or willing to maintain a perception of local and ubiquitous cannibalism: and by muddying the waters, provide an excuse to ignore the question.

There was the suggestion that all our ancestors were probably cannibals at some stage. For most of us, this would have been so far back that now we only acknowledge it to stifle any pangs of conscience in attributing the practice to others.

Then there is the call to accept and not be judgmental about a matter of cultural difference: Aboriginal people may have been just as appalled at the way convicts were treated. That dodges the question of lack of evidence. And it is patronising to tell Aboriginal people that they should not be over-sensitive or take offence at these allegations. Affirmations like "Whether they were cannibals or not doesn't matter: it wouldn't/doesn't affect the way I relate to Aboriginal people", should, I suggest, be treated with a degree of Skepticism.

Finally, there is the assertion that, whatever about Australia, cannibalism has been a recent practice in neighbouring countries. In a subtle way, this gives credibility to claims that it happened here. Three noteworthy examples surfaced in the Australian press in 1996. Laurie Kavanagh (*Courier-Mail* 31/7/96) told how over 320 Chinese passengers shipwrecked on a reef off the southeast of PNG in 1859 en route to the Australian goldfields were supposedly overpowered and eaten by (some 50-100 ?) Rossel Islanders in just three months. My letter to the editor wasn't published.

Then Ross Terrill (*The Australian*, 23-24/3/96) relayed stories from the cultural revolution in China, about 12 and 13 year old children killing and eating their teachers; a local official strolling down the street with a human leg over his shoulder, a piece of a man's trouser still hanging on it, on his way to cook and eat it; human flesh bubbling and boiling in cauldrons in front of local government offices. That's Communism for you!

Thirdly, the allegation that Kuru sickness was transmitted among the Fore people in the highlands of New Guinea by the eating of the brains of its victims was prominent in March-April '96 coverage of the panic originating in Britain over Mad Cow Disease and its possible link with Creutzfeldt-Jacob Disease (CJD), Kuru and CJD cause similar spongy-brain degeneration, and share some familial epidemiology. It has been suggested that Kuru may be a variant of CJD. The 1996 debate in the media about Kuru and cannibalism was marked by a diversity of views: that Kuru was transmitted by eating the liver, not the brain; that bodies of relatives were eaten out of respect, or for regenerative and health reasons, or as a source of protein. But there

was no apparent questioning of its transmission by cannibalism, or the indulgence of the Fore in the practice.

Kuru and the Fore

Let us make a detour here to delve further into Kuru and the Fore. In 1976, D. Carleton Gajdusek received the Nobel Prize for Medicine for his work on the Kuru virus or prion. Arens makes a case study of them in his book, and in a recent article, "Rethinking anthropophagy", (in *Cannibalism and the Colonial World*, Francis Baker *et al.* (eds) CUP 1998) he revisits them, and the debate generated by his 1979 book. Both are recommended reading for anyone tempted to give weight to the above diversions.

While the process of colonisation has kept cannibalism on the agenda, more recently it has been largely sustained by anthropologists, eager to describe the exotic other. For decades, the discovery of a truly primitive people, probably cannibals, became the Holy Grail for many an ambitious anthropologist, particularly Americans. They never allowed lack of reliable observation of the practice to deter them from speculation about its extent, cultural interpretation of the practice, and connection with sorcery and superstition. Many assert that cannibalism used to happen until just before they arrived to study the exotic strangers; and that unlike other customs, it ceased immediately at the urging of the coloniser or missionary.

But not always: it took visits from three anthropologists before the Fore gave up the practice. Ronald Berndt was the first, in 1951: he reported that the practice of cannibalism had been suppressed three years earlier. (Incidentally, Arens' analysis of his report justifies scepticism about Berndt's findings on Aboriginal cannibalism mentioned above.) Then Glasse wrote that the practice had been abolished four years before he arrived in the late 50s Sorenson, who arrived in 1963, said "by 1960 (the practice) was all but gone". But none of these anthropologists, or any other outsider for that matter, ever observed an act of Fore cannibalism.

Perhaps there is an explanation for the inconsistency: that the primitive Fore instinctively knew that cannibalism was a bad thing, and that they should not let a white man, particularly an anthropologist, find them at it. And they may have been equipped with sensitive antennae which gave them years of warning that one was about to come and study them; So they could stop doing it, only to resume as soon as their visitor left.

Gajdusek was a paediatrician and virologist rather than an anthropologist: but in his first letter home from Fore lands, he said he was "in the center of tribal groups of cannibals". Arens traces the process by which Gajdusek, in his search for the mode of transmission of Kuru, moved from inherited genetic factors (too inconsistent with the epidemiology), through environmental or dietary causes, to infection through cuts or eyes, possibly during preparation for burial of the bodies of people who had died from the disease. As the Kuru had been transmitted to chimpanzees injected with infected brain tissue, while attempts to infect via the gastro-intestinal tract had failed, Gajdusek initially declared the hypothesis of transmission by cannibalism "outlandish". And there was no evidence that Kuru victims had eaten anyone: in one letter, Gajdusek specifically af-

firmed that "many of our youngest patients have certainly not consumed human tissue". Colleagues in America persistently urged him to consider transmission by cannibalism; and as visiting anthropologists adopted and advocated that hypothesis, he later declared it "reasonable", and then seems to have gone with the flow, and given tacit support to it. His Nobel Prize lecture even included a photo of men and children eating freshly roasted pig, but captioned in a way which gave the impression that they were eating human flesh.

The triumph of cannibalism

That flow soon become a torrent, washing away any scepticism about the matter. Further inconsistencies were either swept into the background, or caused theories to be modified. The initial epidemiology - the concentration of Kuru among women and young children - was explained by the propensity of women to cannibalism, and the likelihood that they passed tissue on to young children. The dramatic changes in epidemiology were explained by changes in participation in cannibalistic "feasts", rather than equally dramatic change in village lifestyle following the development of coffee plantations and entry into a market economy. The reduced incidence of Kuru was a consequence of reduction of cannibalism. Then the persistence of Kuru required postulation of an incubation period of up to 40 years. While the Fore memories of Kuru first appearing among them about the start of the 20th Century were mistrusted, that date was later suggested as marking the time they began to practice cannibalism. While the Fore practice of calling in specialists to prepare the body of the deceased for burial, since contact with the corpse was considered dangerous, is recorded, somehow such danger did not inhibit cannibalism. While Gajdusek mentions that following his early crude autopsies, his Fore informants changed from being cooperative to recalcitrant, the gathering of information on cannibalism continued to rely on interrogation of the Fore and their neighbours.

Sorenson (*The Edge of the Forest*, Smithsonian Institute, 1976) spent a year and a half in the area in the 1960s. He frankly acknowledges the difficulty of getting reliable information from informants: language difficulties; their unfamiliarity with question-and-answer discourse, which led to questions being treated as threats and insults; cultural shock and amnesia - "Some individuals appeared temporarily to have lost memory of even recently past events of their own lives and made factual errors in reporting them"; and their readiness to comply with suggestions from patrol officers, missionaries and scientists. (p.14s)

For this reason Sorenson chose to place greater reliance on still and motion photography as research tools. To illustrate "biting play" he uses a series of photos (p.194s) showing a laughing young boy, encouraged by an older brother to bite his thumb, hand, wrist and back. A second series shows a boy playfully biting the hand of his toddler cousin in his mother's arms, and in turn presenting his own hand for biting. Sorenson suggests that "The practice of familial cannibalism by the Fore may also be related to this aspect of orality." Wow!

Eureka?

Swept along and bobbing up and down in that torrent, one now finds books like SMH journalist Jennifer Cooke's *Cannibals, Cows and the CJD Catastrophe* (Random House, Melbourne, 1998) The very title alerts us to the ensuing exploitation of the fascination and marketability of the notion of cannibalism. *Kuru, Mad-Cows and CJD* would not have grabbed so much attention.

Arens didn't make it into her bibliography, and there is just one passing dismissive reference to scepticism about the regular practice of cannibalism. It is certainly not a book for the fainthearted: the detailed description of the never-observed butchering, cooking and eating involved in the cannibalistic feast; of bodies buried for a few days so that when dug up the maggots could be cooked as a separate delicacy; of marrow being sucked from broken bones, which were then pulverised to be sprinkled over vegetables - all this is rivalled by the detailed description of Gajdusek's autopsies in a bush hut, and his concerns about the inadequacy of a serrated edged knife to slice the brain samples. One can only wonder which group an observer from another planet visiting Fore country in those years would have identified as having an obsessive interest in human remains.

Perhaps the graphic detail helped the book to win the 1999 Graphic World Eureka Science Book Prize for being "surely the most comprehensive and superbly researched book about the epidemic to date". Arens and his critique have been prominent in numerous letters and articles in the mainstream press, and journals like *New Scientist* and *Lingua Franca*. The *Higher Education Supplements* of both *The Times* and *The Australian* (14/1/98) carried an article by Arens, which dealt at some length with the Kuru, the Fore, and CJD. Did all this material also escape the notice of each of the four judges for the award, or was it dismissed as irrelevant?

The award is designed to encourage the production of "books that communicate science and the results of scientific research to the general public". Its bestowal in this case is a measure of the widespread popular acceptance of beliefs in cannibalism, and serves to entrench them further. It also highlights the magnitude of the task undertaken by Arens. But then Derek Freeman faced similar odds to have Margaret Mead's findings questioned.

Let me throw in two tantalising questions worthy of further research. Would Gajdusek have won the 1976 Nobel Prize had cannibalism not been part of the picture? And is the only reason that cannibalism has not been suggested as a means of transmitting CJD in western countries simply that "we" don't do that sort of thing?

"An awful resonance . . ."

Let us return now to the media melee following the publicity given to *Pauline Hanson: The Truth*. Independently, three respected members of the Jewish community in Brisbane, Sydney and Melbourne, suggested that the allegations of Aboriginal cannibalism were comparable to centuries old Blood Libel. The Libel had Jews killing Christian children and using their blood in the manufacture of the unleavened bread for the Passover festival and other rituals. They pleaded for people to

learn from the use made of such myths by the Nazi propaganda machine in paving the way for the Holocaust.

That theme was echoed in a joint statement (7/11/97) by the three former Labour Prime Ministers: "Hanson's allegations of Aboriginal cannibalism carried an awful resonance of the depiction in Nazi Germany of Jews as a sub-human species".

The Nazi exploitation of the Blood Libel was but one paving stone on the road to the Holocaust, and probably disgusted many Germans. But it was only possible because the Libel was widely, if tacitly, accepted as having some foundation in history. Peuckert, a respected scientist, affirmed and propagated the Blood Libel in the mid-30s: "In conclusion to this shocking list (of child-killings), there remains only one question: for what purpose did the Jews use blood?" But the practice was seen as belonging to the past: something which had led to trials and massacres of Jews in the Middle Ages. The Nazis revived the old allegations, and instituted reinvestigations and initiated trials of Jews charged with the deed in the late 30s and 1940. (*Encyclopaedia Judaica*, vol 4. p.1120f).

Der Stuermer, a newspaper edited by Hitler confidant Julius Streicher - executed after the Nuremberg trials in 1946, still proclaiming undying hatred of the Jews - was one vehicle of Nazi propaganda. It was displayed throughout Germany on bulletin boards erected for that purpose. The issue for 1/5/1934 focused on the Blood Libel. The cover illustration showed eight children with throats cut hanging upside down. Beneath them were two smirking Jews: one with a bloodstained knife, the other with a dish collecting the blood.

That image finds an awful resonance in the equally fictitious scene in *Cape of Dreams*, a documentary produced by National Nine Documentary Unit - the scene of half a dozen Chinamen supposedly found hanging by their pigtales from a tree, waiting for their turn to be clubbed, roasted and eaten by the Merkins, an Aboriginal tribe on Cape York. The documentary described them as a notorious tribe of cannibals who had no second thoughts about eating men, who killed and ate hundreds of miners, showing a preference for the flesh of the Chinese.

When this program was transmitted in 1990, a number of people wrote to QTQ9, pointing out inaccuracies in the program, and its potential to perpetuate racism. They were also provided with extensive research material. A further transmission of the program a year later also brought protest, and an unsuccessful complaint to the then Australian Broadcasting Tribunal. Then in 1993 a Government-sponsored National Conference on the Media and Indigenous Australians led to the development of Advisory Notes from the Federation of Commercial Television Stations, and a Government Statement of Principles which urged the media to "help non-indigenous Australians ... to recognise and to overcome the legacy of colonial attitudes, stereotypes and prejudices."

But these events and the debate generated by Pauline Hanson, had no impact on Channel Nine. With cavalier indifference, they re-screened *Cape of Dreams* in Sydney, Brisbane, Perth and Newcastle on 2/11/97. Had they been broadcasting in 1930s. Germany, would Chan-

nel Nine have used the cover illustration from *Der Stuermer*? Would they have reused it years later, after the role of such images had been exposed?

Unleash the watchdog!

With high hopes, I complained to the Australian Broadcasting Authority (ABA) that, using the terms of the relevant Code, the program was likely to offend the cultural sensitivities of Aboriginal people, and stir up hatred, serious contempt or severe ridicule against them.

Harmful inaccuracy is only a ground of complaint against news and current affairs programmes.

My complaint was unsuccessful, but confirms the epithet of David Salter - Executive Producer of the old *Media Watch* - "the jelly-backed ABA's regulatory non-performance". Ignoring the terms of the code, the ABA said that, drawing on material I had forwarded to demonstrate the role and persistence of the myth, it was obvious that there was evidence that Aboriginal people on Cape York had practised cannibalism. True, the material provided is evidence that some people believe cannibalism was practised: but assertion and baseless anecdote are not evidence. The ease with which presumably intelligent and supposedly impartial people failed to make that fundamental distinction provides a measure of the tenacity of colonial thought-patterns. Anyone so predisposed to accept the cannibalism myth is clearly unfamiliar with the processes which stir up and sustain contempt and ridicule of Aboriginal people: and so hardly qualified to assess the potential of the program to contribute to that, or to offend Aboriginal people.

The ABA also said that the program referred to a particular tribe, and not to Aboriginal people as a whole. Well, that could be said of Pauline Hanson's original statement: but the myth has shown itself to be extremely contagious, with an ability to spread quickly to include other Aboriginal peoples.

They also said that there was no suggestion or inference that cannibalism was a continuing practice. That will be a great relief to the current residents of Cape York, and to the tourist industry.

Finally, they said that the tone of the segments dealing with cannibalism were in no way sensationalised; and that there was no intention on the part of the producers to create any ill will towards Aboriginal people. Now there is a defence which could justify all sorts of excesses.

Let's imagine this Broadcasting Authority functioning in Germany in the 1930s, with a mandate extended to cover the Press. They receive a complaint about the illustration from *Der Stuermer* of Jews collecting the blood of children. Would their finding have been any different to that made now on *Cape of Dreams*? Would it have been any different if the material was used again years later, after its inaccuracy and role had been exposed?

Clearly, we still have a long way to go in purging ourselves of mythical and potentially harmful colonial perceptions.



Character building

James Gerrand

Building Character and Culture by Pat Duffy Hutcheon. Praeger Westport, CT USA and London UK. 286pp. pbk US\$24.95

This is another important work by sociologist educator Hutcheon, who reminds us that character and culture are defining features of a civilisation, points out they are a product of both heredity and the environment and warns that our modern environment is producing bad character and a debasing culture. Just as her previous opus *Leaving the Cave* (reviewed *the Skeptic* 17:1) persuasively argued that only a scientifically informed education could overcome tribalism to create a progressive, rewarding global society, so this companion *oeuvre* clearly calls for the community to adopt measures to build up the scientifically reliable knowledge needed to produce desired good characters and a worthwhile culture.

Hutcheon opens our eyes to the reality that we humans are, above all, social beings; the products of a complex mix of genetic predisposition, organic maturation, and the social interaction that both engenders and contains the socialisation process. It is blindness to think we only require freedom from outside interference and from the imposition of society's beliefs and values to become the free-floating, internally self-sufficient individual.

Hutcheon highlights the four major debasing cultures of our modern society: the culture of violence; the culture of affluence and the culture of poverty; a culture of pluralism or a culture of tribalism; the culture of fantasy.

The most influential of our agencies of socialisation is the electronic media. The compelling power of this institution has functioned to push the culture into anti-social pathways. There is a tide of media-fuelled violence that apparently cannot be stemmed. Not only are our children being addicted to violence but also into a premature, perverted and abusive sexuality. Significant statistics quoted include a sixfold increase in violent crime in Canada since 1963, even greater in the USA; in many American cities half the murders in a typical year involve victims or assailant eighteen years of age or younger. The overwhelming majority of over 4,000 studies on the effects of the media on socialisation conducted since 1950 found a link between aggression and the viewing of media portrayals of brutality. Hutcheon has an annotated biography of 180 of these studies in an appendix.

After discussing the important role of the family in socialising (now faltering), Hutcheon points out this primary agent tends to reflect either "the culture of poverty" in which a particular family is mired or "the culture of affluence" to which a family aspires. Families in which there have never been regular wage

earners, for whom welfare has been a way of life, living in a crime-ridden ghetto whose adult members are in and out of jail, trapped for several generations in the "underclass", they live in the "culture of poverty". Those who have found a productive role in society operate in the "culture of affluence". A "culture of tribalism" was appropriate when "life was nasty and brutal" and you survived by having your family and friends as part of a tribe. Religions fostered the tribal culture, emphasising that their creed was the only revealed truth.

The Age of Enlightenment recognised that that religion was a divisive culture and saw the creation of the first secular nation, the USA, with its constitution separating church and state. Australia followed this example when federated in 1901. A "culture of pluralism" was the alternative with all working together for the common good.

Recent decades have seen the rise of the "culture of tribalism" with resulting conflicts in the Middle East - Jews versus the Moslems, Northern Ireland - Protestant versus Catholic Christians, Yugoslavia - Moslems versus Orthodox versus Catholic Christians, and most recently in East Timor - Moslems versus Catholic Christians. The "culture of fantasy" feeds the human propensity for creating an imaginary world to provide a cushion against the harshness of the surroundings, or a more welcome explanation for an effect than seeking for its cause. In this Age of Science why are so many people attracted to astrology, psychic healing, therapeutic touch etc? Why are middle-class tourists swarming to casinos and the poor lining up for lotto tickets. I suggest the prime reason is the inadequate teaching of science, particularly at primary school level. Hutcheon has clearly presented the problem of building character and culture.

It is up to Humanists and Skeptics to help fellow concerned citizens to work out ways to restore and amend our socialising practises so as to produce the desired character and culture.

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is.**

If it's yellow, it isn't.*

* Unless we have blundered at this end

Stop laughing, this is Sirius

Mark Newbrook & Colin Groves

The Sirius Mystery Temple, Robert; (2nd edition), 1998 (Random House, London) / 1999 (Arrow)

In 1976, in the first edition of this book, Robert Temple claimed (elaborating upon Griaule & Dieterlen 1950, 1954, 1965, etc) that the Dogon, a people of Mali in West Africa, have traditions importing specific knowledge of the Sirius system (8.7 light-years from Sol (the Sun) and Earth). He believed they had obtained this knowledge from intelligent space-faring aliens who had visited their ancestors. The Dogon recounted traditional stories of such a visit, by amphibious beings called *Nommo* who reportedly lived on a planet in the Sirius system. Temple cited supposedly parallel stories from Mesopotamia and elsewhere as evidence of a Nommo expedition to Earth several thousand years ago, when the Nommo had also influenced these other human cultures and had, indeed, been largely responsible for the emergence of civilisation.

The specific alleged knowledge of the Dogon mainly involves the white dwarf companion of Sirius A, known as Sirius B. Sirius B was discovered by astronomers in 1862 after a search for the source of perturbations in the observed long-term motion of its primary (the larger object about which a body revolves, in this case Sirius A). It has only 0.001 of the luminosity of Sirius A; it is, therefore, not a naked-eye object at its range, and is in fact a very difficult object to see, even telescopically, because of its adjacency to the much brighter star. Photographs were not obtained until 1970. The spectrum of Sirius B was analysed in 1915; it was one of the first white dwarfs to be described. White dwarfs are stars of normal mass nearing the ends of their careers, having contracted after a giant phase: their diameters are comparable with those of rocky planets (which contributes to the problems with visibility) and they are thus extremely dense (a cubic centimetre may weigh many tonnes). Sirius B has a mass similar to that of Sol but a diameter similar to that of Earth.

The Dogon allegedly know most of this, although much is couched in botanical metaphors of various kinds (hence the need for exegesis). They also have an allegedly long-established ceremony called *Sigui*, involving large wooden masks which are systematically stored later (several very old specimens survive); this occurs at 60-year intervals, and is associated with a 60-year orbit of Sirius A and B about their common centre. In this context, it should be noted that the astronomically-determined figure for this orbit is now given as 50 years. Randi (1978:69-70) was already drawing attention to this anomaly; but, to confuse matters further, Griaule & Dieterlen also reported rival Dogon traditions giving this smaller figure.

The Dogon are also said to be aware of a third star in the Sirius system, hitherto unknown to astronomers (but

see below). This star is apparently the primary for the planet of the Nommo.

If one accepts that the Dogon do have detailed knowledge of the Sirius system, only a limited number of explanations seem possible. As Howe (1998:269-70) reports, some Afrocentrist writers (especially Welsing, whose work on this matter remains unpublished) have advanced extreme claims to the effect that amazing powers of vision are conferred by the presence in the body of large amounts of melanin; Adams (1983a, b) even suggests that the Dogon or other African groups disposed, at a very early date, of the technology needed to build astronomical telescopes (now lost).

Naturally, there is no good reason to accept either of these positions; but Temple's own hypothesis is almost equally outrageous. However, his book attracted a great deal of attention when it first appeared - not all negative. It was perceived as rather more sophisticated than most of its kind (this was only a few years after the *Chariots Of The Gods?* incidents), and over the next few years it received informal critical comment from skeptics and science writers as diverse as Patrick Moore, Carl Sagan, James Randi and later Adrian Berry. Berry (1986:54-56) was in fact satisfied that the Dogon did indeed possess traditional knowledge of the Sirius system; he linked it with mysterious ancient reports of Sirius (supposedly Sirius A) appearing red, and suggested that the ancestors of the Dogon had observed the shrinking of Sirius B from its red giant phase to its present small proportions and thus deduced that it was now very dense. Current models of stellar evolution would suggest that this process would require much more time than this hypothesis allows.

One of us, Colin Groves, had been an anthropology undergraduate in London in the 1960s, and when he heard about Griaule and Dieterlen's theory of this sophisticated Dogon cosmology he was astonished. He raised the matter with one of his Social Anthropology lecturers, and learned that it was already the opinion of serious anthropologists that Griaule and Dieterlen's equation of Dogon beliefs and astronomical facts was extremely dubious. The two French ethnographers, heavily influenced by the structuralist tradition, had probably located a small number of Dogon elders, discussed their worldview with them and transcribed the discussion, placing upon it their own interpretation. Groves' lecturer suggested that the general Dogon population might well be quite unaware of such matters. Indeed, Griaule & Dieterlen admit this latter point on the very first page of their article. They distinguish between 'exoteric myths', which they characterise as 'superficial knowledge' known to all, and 'esoteric myths' which 'present other identifications and much wider connexions [sic]'.

A Physical Anthropology lecturer was able to add to this the observation that rates of twinning are much higher in West Africa than elsewhere in the world; families with twins are considered special. It is obvious from Griaule & Dieterlen's account that the Dogon (like some other West African peoples) ascribe a fundamental status in creation to twinning. The cosmic egg was divided into twin placentas, each bearing twin Nommo, 'direct emanations and sons of God... and prefigurations of man'. Each in turn was a twin-pair of male and female: the male person of one pair, Yurugu, escaped prematurely from the cosmic egg and from his fragment of placenta made Earth, which was thereby incomplete, imperfect and impure.

Now Sirius A, as the brightest visible star, is one of the most conspicuous of the heavenly bodies; hence, for the Dogon as for many other peoples, it is among the most important. Its helical rising also coincides with the hottest, driest season of the year. Given its significance, it may be suggested, Sirius A naturally must be perceived as having a twin, which will be as small and inconspicuous (not to say invisible) as Sirius A is large and bright, and will represent the principle of fertility (hence the botanical references, which centre on the *digitaria* seed, the crop staple). The two revolve about each other in the sky. On this analysis, the Dogon did not 'know' about Sirius B in a scientific sense; it followed from their cosmological outlook that such a dark companion of Sirius A had to exist. Such knowledge is, in Griaule & Dieterlen's terms, esoteric, not exoteric. The average Dogon very probably has never been concerned with these concepts.

This is, indeed, what van Beek found when, from 1979 onwards, he visited the Dogon several times. Already troubled by the inconsistencies in Griaule's reports (both in partnership with Dieterlen and in two books of his own), he troubled to question ordinary Dogon about their beliefs. None of his informants had any knowledge of the dark companion of Sirius A, the cosmic placentas or any of the mythology and symbolism which Griaule had discussed at such length. Still more damagingly, van Beek interviewed some now elderly people who had been among Griaule's informants when young in the 1930s. They told him how Griaule had pressed them to give him the names of category after category of insects, until in desperation they had simply invented some. Van Beek concluded that Griaule had introduced concepts to his informants' minds and then, in conversation, drawn them forth again and again and recorded them; while the trials and tribulations of the Nommo, twinned and un-twinned, were in all probability those of Christ, introduced to the area by Protestant missionaries in 1931.

Griaule's daughter, Calame-Griaule, maintains that this scenario is impossible; on the other hand, it is endorsed in part by de Heusch, who did some fieldwork among the neighbouring Bambara and picked up echoes of similar cosmology there. But both of these commentators make the important point that van Beek, a human ecologist, has himself misunderstood the nature of mythology. There are numerous contradictions in the Bible and in the corpus of Greek myth; there might easily be many more contradictions within the mythic thought of a non-literate people. Yet van Beek appears

to have expected a consistent, homogeneous text, and to have been disturbed not to find every Dogon peasant reciting the myths of the twin Nommo. This is not how such things work. Mythology is piecemeal; the 'western', literate mind expects a coherent world-view, and, when one did not present itself, Griaule apparently helped the Dogon to construct one, while van Beek took the lack of coherence as evidence that Griaule had manufactured it *in toto*.

It does not seem that Griaule actually lied. He probably encountered some rather sophisticated priests and other intellectually inclined older men, and enjoyed philosophising with them. As they talked, the Dogon men began to see things in a different way, pushed their religious ideas to their logical conclusions, and shared with Griaule the ideas which they had perhaps never articulated before and which were probably forming in their minds as they talked. **None** of these men was lying. But this means that commentators must be very careful about what is and is not 'the cosmology of the Dogon'. Even Griaule's interpretations of Dogon belief have had to be reinterpreted by Temple in order to support his detailed account of the Dogon's 'knowledge' and the alleged circumstances of its origin.

Another proposal (first suggested, apparently, by Sagan) is that the Dogon had learned about the discovery of Sirius B from earlier French anthropologists and had already incorporated this information into their developing system of myths. Mudimbe (1988:13-15) discusses the arguments for and against this idea. Howe (1998:270) finds the notion attractive but does not endorse it strongly.

Because Griaule believed that the Dogon possessed traditional knowledge about the dark companion of Sirius A, he checked with astronomers on his return to Paris, to learn that just such an object had long been known to exist, though it was quite invisible to the naked eye. In these circumstances, the Dogon were assured of fame.

It is easy to become very excited about this (as did Griaule and later Temple), until one remembers the true nature of myth: a collection of culturally meaningful tales, which are constantly evolving and taking form even at the moment of utterance. Unfortunately, the general public persists in thinking of myth as garbled history. This is true only of a very few myths; as a general paradigm of interpretation it has long been abandoned by cultural anthropologists, and was outdated even in 1955 when Robert Graves published his book on Greek myth 'embodying the conclusions of modern anthropology and archaeology'. But it obviously informed Griaule's reaction to discovering that Sirius A really does have a companion; and it is very conspicuous in nonstandard theories about the early history of humanity, for instance in the works of Talbott and his fellow 'Saturnists' who continue to publish their astronomically bizarre papers in journals such as *Aeon*. Temple too is steeped in this nineteenth-century misconception. Most people who hear about the Dogon 'mystery' never read even Griaule or van Beek, still less Levi-Strauss, Leach or any of the other anthropological writers on myth; their entire knowledge of the Dogon comes second-hand from Temple, who is all too ready to shore up their misunderstanding of myth - and to

misrepresent other things, such as the genetic relationship of the Dogon, when it suits his purposes - in order to sell a million copies of his book.

Temple's work is, in fact, by no means the most extreme manifestation of the minor cult which now surrounds the Dogon. There are numerous web pages and low-level articles about this matter, some of them ludicrously uncritical. For instance, there is a web site entitled *Dogon and Sirius*, which begins with a message allegedly channelled by 'Pleiadeans' to the medium Barbara Hand Clow; this claims that Sirius is a 'trinary' system which 'has had great impact on earthlings [sic] by means of various initiatic African cultures, such as the Egyptian and the Dogon'. In addition, the Dogon 'were so in tune with [the] solar mind linked with Sirian genius that they filled the plains of Africa with a panoply of outrageous animals' (ie, the familiar contemporary African mammalian fauna!).

However, Temple's book is much the best known popular source on the subject, and it may thus be worthwhile to examine it in more detail. It has to be said that Temple's use of disciplines outside anthropology to support his case also leaves much to be desired. To exemplify: in his paper 'Cows, Dogs and Ancestors' in *The Skeptic* 14:2 (1994), Mark Newbrook analysed Temple's use of historical linguistics in the original 1976 book. Mark observed that, like many non-mainstream writers, Temple had largely ignored the theoretical gains of the last 150 years; he nonchalantly equated vaguely similar words from apparently unconnected languages, in an unsystematic manner nowadays deemed utterly unreliable, whenever this enabled him to claim that the relevant languages/peoples had an unrecognised common origin or had had unrecognised but influential contact in the remote past. He derived much support for his thesis by finding alleged cognates in Dogon, Ancient Egyptian, Greek, Hebrew and other ancient languages of the region, in just this casual and unreliable manner. He also 'played fast and loose' with various Ancient Greek words, nonchalantly announcing that words with the same or similar consonants but different vowels are obviously cognates. Here he repeatedly flew in the face of the large existing body of knowledge about Greek etymology and Indo-European philology. He also introduced highly speculative and controversial re-interpretations of Egyptian hieroglyphs (see also later). In fact, much of Temple's specific concrete 'evidence' was linguistic; and it was almost all of this highly suspect nature.

Now, in 1998, Temple has updated his book, encouraged by astronomical discoveries which he interprets as supporting his case. A third star, or at least a new major object in the Sirius system, has indeed been proposed (Benest & Duvent 1995); it has been suggested that it is a very small dwarf with 0.05 the mass of Sirius B, ie, only 50 times the mass of Jupiter. Objects of this mass are marginal stars; usually they are classified as brown dwarfs. Even if this 1995 discovery is confirmed, it is not at all clear that such an object corresponds with Temple's interpretation of Dogon views about a third star in the system, nor that the observed object is a likely primary for an inhabited rocky planet. The conditions to be expected on a rocky planet orbiting such a brown dwarf would not seem conducive to the development

of advanced life forms. In fact, the entire Sirius system is hardly promising in this respect, owing to the nature of its major primary: bright stars of this kind are probably too short-lived for advanced life forms to evolve in their systems, and in addition their strong stellar winds are likely to create unsatisfactory conditions in their vicinity.

Temple's understanding of astronomy/cosmology is in fact suspect in several respects. In a number of places, notably pp 59 (intra-solar system events allegedly affecting the much more distant pulsars) and 471 (problems with the notion of 'unbounded' as a property of the universe), he seems to have simply misunderstood his sources. And some of his arguments are rather faulty, as where (p 14) he suggests that even a brighter Sirius B would always be invisible from Earth because of the brightness of the primary (but, if Sirius B's diameter were great enough and its orbit suitably aligned, it would periodically eclipse the primary wholly or in part, rendering itself visible; see Berry's suggestion, referred to earlier).

As in the original book, Temple often adds archaeological and other historical 'evidence'; but in many cases this too is dubious or worse. For instance, he suggests (pp 321-358, summary on pp 355-358) that in the distant past the Dogon migrated to their present location from the Mediterranean, bringing with them Egyptian beliefs. There is plenty of evidence - including cranio-metric evidence published by Howells (1973, etc), as well as comparative physiology more generally - that the Egyptian and Dogon populations cannot have a recent common origin.

Temple also regards the Sphinx, the Pyramids etc as relevant to his case because of alleged cultural links between Egypt and West Africa, and embraces the currently popular but highly dubious revisions of Egyptian history. In his new opening chapter, he dismisses mainstream objections to West's claims about the vast age of the Sphinx (put at over ten thousand years, on the basis of some evidence involving water erosion) in a most glib and indeed inaccurate manner, alleging hidebound dogmatism where none exists and ignoring the very real problems and uncertainties surrounding West's interpretation of the evidence and its place within Egyptological knowledge as a whole (pp 17-33, especially 23-24). On the other hand, he goes on (pp 18-21, 47-55) to reject the theory of a very old but purely human civilisation along the lines of Atlantis, which is upheld by West and others, in favour of his own theory of extraterrestrial contact in slightly less remote times. The evidence for either of these two viewpoints is hardly impressive. He also repeats (p 90) the popular notion that there is widespread evidence of a sudden origin of civilisation which mainstream scholarship finds inexplicable and therefore suppresses or ignores. Temple even speculates (pp 47-55) about evidence of the Nommo elsewhere in the Solar System: he suggests (p 49) that Phoebe (Saturn's tenth major satellite) may be an artificial object (a Nommo spaceship-park), and (perhaps predictably) manages to bring in the now debunked 'Face On Mars' (p 54). More generally, Temple continues to rely heavily on myths (see, eg, pp 362-366; also pp 291-293, on Graves) as evidence of real events in ancient times. As we have seen, myths are

not in general to be read as distorted history, and indeed they often permit multiple interpretations.

In addition, little confidence is inspired by Temple's increased reliance upon alleged numerical correspondences - which he interprets in an overtly Pythagorean framework. The ease of finding figures of this kind to suit one's case is notorious. There has been much misguided work of this kind on the Giza Pyramids, and indeed Temple contributes to this unfortunate tradition (notably on pp 33-37). At times the numerical claims appear bizarre, for instance where Temple applies them to the astronomical situation: on pp 39-47 he finds significance in the mass ratio of Sol and Sirius B (let us remember, these stars are 8.7 light-years apart), suggesting that the two solar systems form part of an enormous 'cell' in space (the 'Anubis Cell'), within which long-range order exists. In the same section he also links these and other ratios involving the physical features of these stars with ratios involving the Giza Pyramids. On pp 44-45 he descends into outright mysticism and even suggests that the Anubis Cell may (or must!) be itself alive! Similar manipulation of ratios occurs on pp 58-59, in connection with the dimensions of the inner planets of Sol. Other problems of this type appear on pp 239-293 (a long speculative discussion of the alleged numerical significance of the geographical location of oracles and other key religious sites in Egypt and various surrounding countries, interpreted in terms of 'octaves'; note especially the maps on pp 241, 242, 252, 259, 275); some of these ideas arise again on pp 362-363 ('symbolic journeys' involving equivalences of distance between various ancient cities), etc, etc.

Furthermore, Temple's grasp of historical linguistics has not improved in 22 years; his new examples are just as unsystematic and unconvincing as those he presented earlier. In fact, many of his examples are repeated from 1976. A key set of examples involves a large group of words commencing with [ark-], [arg-] or the like, taken from a wide range of languages and alleged / assumed by Temple to be cognates (pp 321-358. These include Greek *arkeo* ('be sufficient'), *Argo* (the hero Jason's ship), *Argos* (personal name), *arguros* ('silver'), etc, English *ark*, Egyptian *arq* ('end', 'complete', etc), Sanskrit *arksha* ('stellar'), etc. (Admittedly his interpretation of these words is not always the same as it was in 1976; but he still draws the Biblical story of Noah's *Ark* into this discussion, on pp 180-181, 244-246, etc.) Many of these words have known, unrelated origins; for others, the etymology is so doubtful that any comment must be speculative, and Temple's own proposals are often far-fetched, as well as being derived largely from untutored consultations of non-specialist dictionaries. Sometimes Temple misinterprets these sources; on p 220 he imagines that when Liddell & Scott in their well-known Greek Lexicon define *kirke* as 'an unknown

bird' they mean 'a bird which was unknown to the ancient Greeks' rather than their actual meaning of 'a bird whose identity is unknown to modern scholars'. Other examples of implausible and unsupported philological speculation include: Temple's equation (p 230) of Greek *helios* ('sun') and *heros* ('hero'), despite their known, unconnected etymologies (parts of which he actually acknowledges), and his linking of them both with Egyptian *heru*; similar nonsense involving Greek *tuphlos* ('blind') and various Egyptian words on pp 337-340; far-fetched claims regarding puns in Greek (pp 359-360); etc. On an epigraphic front there are also some further dubious interpretations of Egyptian hieroglyphs, some of them drawn from the now rather outdated and at times idiosyncratic work of Wallis Budge (1972, etc) - see pp 131-134, 351, etc.

At one stage (pp 369-370), Temple actually attempts an analysis in terms of the concepts and methods of

mainstream historical linguistics. He presents a novel account of 'laryngeal theory', which is an attempt to explain a key phonological development in early Indo-European. He apparently developed this proposal around 1973. However, his understanding of the subject is not sufficient for such a task. For instance, the sounds actually described as *laryngeals* are specific to Hittite, but they are clearly reflexes of Proto-Indo-European phonemes which appear in other guises in other ancient Indo-European (IE) languages (the decipherment of Hittite confirmed some previous theorising to this effect). Temple must again have misinterpreted what he has read; he seems to imagine that the Hittite

laryngeals are unexplained in IE terms and without reflexes in other branches of IE. With this in mind, he seeks to relate a sample of eight (!) Hittite words containing *laryngeals* to Egyptian pseudo-cognates containing 'deeply-breathed vowels' and 'strange guttural sounds' (hardly the best phonetic terminology!); these sounds were allegedly replaced by the *laryngeals* when the words were borrowed from Egyptian into Hittite (which would suit his pseudo-philological / historical argument at this point). Several of these words in fact have known IE etymologies, and indeed Temple actually gives Greek and other cognates (which he seems to believe - quite wrongly - are descended from the Hittite forms through series of changes including the loss of the *laryngeals*). Temple is ill-advised to advance novel specific theories in an area about which he is clearly not very well informed.

Temple at times seems to see intellectual debate in a rather 'postmodernist' or even (pseudo-)relativist way, as being very largely a matter of rival 'paradigms' (chosen by their advocates through personal psychological disposition) rather than as a genuine, honest search after better solutions to questions, conducted with some hope of partial, real success. On p 19, for instance, he

**... he also links
these and other
ratios involving
the
physical features
of these stars
with ratios
involving the
Giza Pyramids.**

tries to explain the adherence of West and others to the 'Atlantis' viewpoint, against what he sees as strong counter-evidence, in terms of how their minds 'run'. He is predictably not so quick to recognise this kind of factor in his own thinking. In addition, he shows little sign of having taken on board scholarly criticism of his ideas; in the relevant section of his new introduction (pp 5-16) he is instead more concerned with televised documentaries (in the late 1970s) and (like many fringe theoreticians) with possible governmental conspiracies to silence him. And he is often anti-rational/anti-scholarly. One of the 'best' examples of this is a fairly fierce diatribe on p 361 directed against those who do not 'comprehend' non-obvious (alleged) correspondences (but why should one accept such 'links' in the absence of good evidence?). Elsewhere, a 'New Age' agenda shows through; for instance, on pp 11-12 Temple endorses the idea that the USSR accepted the reality of paranormal powers and sought a monopoly in this area, and he goes on to evince a naive acceptance of the alleged powers of Uri Geller; on p 36 he seems to imply that he is better equipped than conventional 'experts' to unearth hidden mysteries in their disciplines. (It is not clear how far, if at all, he supports channelled messages about Sirius such as those quoted above; but those responsible frequently cite his book and he has much to answer for in this respect.) On the other hand, like many such writers who affect to despise those whom they see as hide-bound mainstream scholars, he frequently cites these same mainstream scholars whenever they support his case to any degree at all, or can be so (mis-)quoted.

Overall, despite Temple's efforts to seek more evidence to support his views, there seems no more compelling reason to accept his thesis now than there was in 1976.

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Photographs and cartoons needed

Readers will have noticed that we are trying to brighten up our pages with the inclusion of more illustrations. We would like to continue this trend, but we need your assistance.

If you have photographs of people or events that might interest other Skeptics, please send us a print. We ask that you don't send your only copy as our filing and tracking system is one that was discovered at an archaeological site on Mt Arrarat by Ian Plimer.



While the editor was in the UK recently, driving through Lancashire, just north of Burnley, he came across this inn in the village of Whalley. As our benefactor, whose generous bequest allowed us to set up the Australian Skeptics Science and Education Foundation, was the late Mr Stan Whalley, it seemed like too good an opportunity to miss.

The lower photo is pure self indulgence on the editor's behalf. It is the famous Bat & Ball inn at Broadhalfpenny Down, in Hampshire, once owned by John Nyren, who drafted the first official Laws of Cricket. The historic cricket ground is across the road.



If you don't want continue to be bored rigid by the editor's holiday snaps, please send us your relevant photographs.



Richard Annells Champion (1925 - 1999)

Terrence McMullen & Barry Williams

It is with deep regret that we report the death earlier this year of Professor Richard Champion, the long time treasurer, and a Life Member of the NSW branch of Australian Skeptics.

Dick Champion carried out his work as treasurer with great dedication during the period of the most rapid expansion in our numbers and was always ready to give wise advice based on his very distinguished career as a psychologist.

In the mid 1990s, when increasing ill health forced him to relinquish his position on the committee, Dick, the possessor of a very dry sense of humour, was tickled by the announcement that his successor was also named R A (Rafe) Champion, a fact that greatly amused him, but which caused a great deal of confusion at our bank. He also took great delight in always claiming that his title as Emeritus Professor was a misnomer, insisting that in his case it should have been A-meritus - without merit. This was, of course, completely untrue, as Terry McMullen's appreciation (below) will show. But it was the measure of Dick that he never took himself too seriously, surely a defining characteristic of a true Skeptic.

Dick was a delightful man and one who carried his learning lightly, his only concession to pedantry being a distaste for the misuse of the English language. He took delight, in committee, in chastising the editor for typographical and grammatical gaffes in *the Skeptic*, to which the only counter was to point out that in banking subscriptions he occasionally made arithmetical errors which were invariably in the bank's favour. It was a case of the illiterate editor v the innumerate treasurer and many good natured arguments ensued, to the amusement of the rest of the committee. All who knew Dick will be saddened by his death and the Skeptics movement will be the poorer for his passing.

We add an appreciation of Dick Champion's academic career by his former colleague and student, Dr Terry McMullen, Senior Lecturer in Psychology at the University of Sydney.

Dick Champion - an appreciation

Dick Champion was McCaughey Professor of Psychology at the University of Sydney when he retired in 1987, thereupon being granted the title of Emeritus Professor. In 1947 he graduated from that university as a Bachelor of Arts with First Class Honours and the University Medal in Psychology. There was only one university in Sydney then; its numbers were swollen by returned servicemen from World War II and Dick was appointed to a junior staff position in the Department of Psychology.

This was to be his base for the rest of his academic career. In 1953 he received a Fulbright Travelling Fellowship to study principally under one of the top figures of the day in the psychology of learning, K. W. Spence, at the University of Iowa. Dick returned to Sydney with both an Iowa Master of Arts degree and a conviction that behaviourism was the only way to go in studying behaviour: "mind" thereafter was for him a dirty word. He was promoted up the academic ranks and was appointed to a chair in 1965.

Other achievements of Dick's also testify to his intellectual and scholarly prowess. He won a Fellowship at Yale University from the Foundation Fund for Research in Psychiatry in 1962; later in his career he was Senior Foreign Science Fellow of the U.S. National Science Foundation at the University of California at Irvine, and in Munich became Visiting Associate in the Max Planck Institute of Psychiatry. He was instrumental in the amicable parting from the British Psychological Society by its Australian Branch, becoming the independent Australian Psychological Society's first President in 1966. Between 1973 and 1978 he was Editor of the *Australian Journal of Psychology*. He was elected as a Fellow of the Australian Academy of Social Sciences.

In addition to scientific papers Dick wrote a book on learning called *Learning and Activation* (1969), which was well and widely received. It was one of a set of introductory texts which he edited.

He had several stints as Head of Department - a most demanding job because the Psychology Department was, and is, very large. He was an excellent Head of Department, a skilled administrator, who provided both academic and personal leadership. He was dedicated to traditional academic values generally, and to the ideals of scientific method and objectivity in science especially. He was proud of having moved the Department of Psychology from its base in the Faculty of Arts to the Faculty of Science, although Arts students could, and do, continue to do majors in Psychology. He would be horrified by current relativistic attacks on scientific objectivity.

Dick was a self-effacing man. The concept of the "God Professor" was repugnant to him. He did not dictate to members of his staff: they were his colleagues who had their own views, he respected their right to disagree with him theoretically and to organise their courses in their ways.



Another possibility

Bob Nixon

The breakdown of the family unit? The fact that western civilisation is turning away from God? The rise of feminism? The United Nations and its plan for the one world government? The acceptance of homosexuals as normal? Pornographic and/or violent films? No, friends, I have a new theory as to why civilisation is coming to an end.

First, let's agree that civilisation is indeed about to fall into an abyss. What form it might take we do not know. Nuclear war has taken a back seat to environmental decay in recent years, but we are threatened also by several "them"'s, from the north, from the east, from outer space. What form our destruction will take is immaterial to our discussion here, all I urge is that you accept we are doomed, it saves a great deal of effort on my part if you simply agree with me and we can get on with my theory.

Okay? It's hats. That's right, hats and the wearing of the same. If I understand what Occam had to say we have to look for the simplest answer, and hats are damn simple. A few examples may help to clarify: The military, not a better disciplined, well-rounded bunch of chaps could you find. Their ability to stand in straight lines and to jump over walls (although not necessarily at the same time) is legendary. And they all wear hats. Bishops, rabbis and other religious types. Decent blokes one and all, and all with their heads covered. Police, those protectors of the community. Cowboys, with their neighbourly ways and their "Howdy Ma'ams". Damn good fellows to have on your side in a scrap, particularly if the hat is white. Country folk, where the men strut their gentlemanly stuff in their Akubras and the ladies know the worth of a sturdy hatband.

The practice of wearing some form of headgear seems to have disappeared somewhere around the early 1950s. In all likelihood it was a backlash of military service. All those fellows coming home from war and discarding their Panamas, porkpies and cloth along with their steel helmets and berets. Almost immediately arose those young tearaways on their motor scooters. There were bodgies and widgies, so the old folks tell me, roaming the countryside looking for trouble and falling upon small towns like locusts.

A word here to head off the criticism I can feel building among the less open-minded among you. Helmets

are not, technically speaking, hats. The truth of this fact can be clearly seen by the fact that motorcycle riders, construction workers and American marines are not the sort of people you want to be trapped in an elevator with. Nuff said on that one, I think.

Back to the 'fifties. As hats became less common, violent crime, bad language and the price of oil all rose alarmingly, while there was a distinct decline in the average number of "Howdy ma'ams" spoken daily. By the sixties, hats were rarely seen in any form. Readers hardly need reminding that the sixties saw the escalation of the Vietnam war and the assassination of President Kennedy by three bareheaded men (Yeah, three - a secret service agent, an irate gangster and an alien mutant in the employ of the CIA). Most telling of all, Fidel Castro aimed missiles at Florida, where thousands of elderly gentlefolk sat in the sun in their hats. Fidel even wore a hat of his own, but only to conceal his plans for world domination. Cunning.

During the seventies I was forced to wear a school cap for the first two years of my secondary education, and life was simple if a bit dorky. Later, capless and disenchanted with life I came to believe that tattooing is an art form while ballet is for girls. These days I see my old school colours sometimes as I travel on the train. Their new guardians, sans cap, can be seen carving the school crest into the upholstery and slow moving pensioners, which tells me that while discipline has certainly gone out the window, the standard of art education is improving.

The eighties well forget it. Where were all the hats in the eighties? Where was anything in the eighties actually, but that's another story.

In the nineties we have the depletion of the ozone layer, and the advice that were slip, slop and slap. The slap bit means put a hat on your head. It's strange to think that solar radiation may be responsible for the return of polite society. Those who heed the warning more readily are the young, with their baseball caps turned backwards as they discuss basketball while shopping for a new Pittsburgh Steelers' sweatshirt. Our nation's future leaders?

Actually, there's something, I wonder if the CIA has gone into the clothing market. Worth thinking about, that one.

**Start planning now to attend the
Third International Skeptics Convention in
Sydney, November 10-12, 2000.**

Banana bendings

Michael Vnuk

In preparation for our October meeting with the creationists, the August meeting had two Queensland Skeptics speaking about creationism. John Stear, who maintains the "No Answers in Genesis!" Web site, discussed, among other things, some creationist misconceptions and how his Web site is increasing in size and popularity. Cheryl Capra, a science teacher, spoke of her experiences at school, with a creationist who taught religious education in year 7 with a very anti-science approach. He and his text were removed through the efforts of Cheryl and others. She also had some involvement in changing the State's science syllabus.

* * *

In September, Prof Paul Wilson, Dean of the School of Humanities and Social Sciences at Bond University, spoke on the myths and reality of criminal profiling. He is a criminologist who has written and commented publicly on many issues related to crime. The technique of criminal profiling is used by the FBI and others to build up a psychological picture of a criminal. It is usually applied to serious, repeat criminals, such as serial murderers. Paul said that criminal profiling is somewhere between an art and a science, and needs to be more scientific. Although there have been some spectacular successes and the FBI claims a high rate for their version, criminal profiling leads to few arrests. It can, however, provide useful leads and ideas for questioning.

* * *

October saw the much-anticipated meeting with the creationists, and nearly a hundred people attended. The first invited speaker was Prof Philip Almond, Head of the Department of Religious Studies at the University of Queensland and not a creationist. He described the creation story of Genesis as the "central myth" of the last two millennia which has been used to legitimise and explain many things. For much of this period it has also been treated as history, but

this has changed in the last two centuries. He explained how science can't talk about God and remain science, and how creation science is religion not science.

A team of people came from Answers in Genesis, including the speaker Dr Carl Wieland, and a panel comprising Dr Tas Walker, Dr Jonathan Sarfati and Dr Don Batten, who, with Dr Wieland, answered questions from the audience after his presentation.

Skeptics President, Bob Bruce, ensured that questions were generally brief and from a range of people, and the meeting proceeded fairly civilly. Among other things, Dr Wieland opened by stating that Christianity stands or falls on its truth claims. He tried to separate two different types of science: operational science, which deals with repeatable facts in the here and now; and the science of the past which can only view through theories. He said that there can be "no proof in the past" and reminded us that "evidence is not proof". He noted that the founders of science accepted miracles, whereas now miracles are automatically excluded in science. He described evolutionists as having a "faith commitment" to evolution. He discussed DNA, which is used as evidence of descent by evolutionists, but which creationists would see as evidence of a creator repeatedly using one smart design. He claimed that many more people have been killed this century than in the past due to philosophies based on evolution.

Questions covered many topics, including the historical nature of the Bible (it is historically accurate, according to the creationists); why God allowed the Jews to massacre the Midianites (it is God's prerogative to take human life); how the animals all fitted on the Ark (many need not have gone on, eg fish, and some "speciation" occurred afterwards); how the kiwi and koala got to the Ark and back (pre-Flood land distributions and animal distributions are not known, nor are the movement of continents since then, which could have been much faster); what the creationists think of the Vatican's apparent

acceptance of evolution (Dr Wieland will not defend the Popes!).

Prof Ian Plimer discussed recent studies which present a coherent picture from several scientific fields that the Black Sea suffered a catastrophic flood around 5600 BC. At that time, the Black Sea was separated from the world ocean and its sea level was at least 100m lower. When the Bosphorus was breached, the filling of the Black Sea rapidly submerged large areas of low-lying land, displacing many people and perhaps giving rise to flood legends among different civilisations. Dr Walker stated that enough differences exist between Black Sea event with its good geological evidence and the Biblical record of the Flood [with no evidence at all], such as no evidence of prolonged rain nor that the waters receded in the Black Sea flooding, so he considered the two events to be separate. Dr Walker was asked why his recent honours thesis in geology, which included radiometric dating of rocks over 200 million years old, quoted such ages with no mention of how they conflict with the Biblical record. He discussed the figures and said that isotopic patterns in the rocks did not relate to age. Ian also accused Tas Walker of misleading lay people by ignoring much scientific work when discussing scientific questions in creationist publications.

* * *

Following media reports of the deaths of people trying to subsist on air alone (the breatharian philosophy), Bob Bruce contacted Jasmuheen of the Self Empowerment Academy who makes such claims in Queensland. The New Zealand Association of Rationalists and Humanists had offered her \$80,000 if she could survive a month without food or water and then run a mile. Bob, on behalf of the Australian Skeptics, offered her the standard \$100,000 challenge. He was already working on protocols, venue, security and medical supervision, and had done some media spots, when *60 Minutes* approached Jasmuheen. Although Bob had given *60 Minutes* ideas and suggestions, the Skeptics were not mentioned in the segment broadcast, which rankled a little.



Southerly aspect

Allan Lang

One benefit of holding conferences is it raises the media awareness of the Skeptics, and they are more likely to think of contacting us. The Friday after the Conference I received a phone call from a TV reporter from *Today-Tonight*, asking if I knew about Weeping Madonna, specifically the one at a Vietnamese Catholic Church at Pooraka (which I later found out had been previously the subject of a story on a different TV channel).

The reporter wanted to find a skeptical expert on the subject. After we had a brief conversation about the topic, I told him I while I couldn't think of any skeptical expert offhand, I would try and find one. In fact, I predicted that the name would probably occur to me within half an hour of hanging up the phone. If I could only learn to trust my predictions I could set up as a Psychic. It was actually only 10 minutes when I recalled a snatch of background conversation heard at the convention. But who was speaking? Bob Nixon? It took a couple of days to locate him, but it was he.

The TV report went to air (in South Australia) on Friday, November 19, covering two SA Weeping Madonna. One was the god ol' Yankalilla Miracle, but here it turned out the tear in Madonna's eye was only in Father Nutter's mind's eye - no real tears. The other, at Pooraka, was weeping, but the Bob Nixon of the Victorian Skeptics was able to demonstrate how this could happen, absent a miracle.

The really puzzling aspect is that the first reporting of the Miracle was on the ABC, and the skeptical debunking was on Channel 7 - world turned upside down.

* * *

As collateral damage from publicity about the conference, Skeptics SA has also been getting a few odd communications. One correspondent (who hopes the Skeptics are not promoting atheism) has asked if we could see fit to publish, in our newsletter / website, her response to a long exchange, in the *Advertiser* Letters to the Editor, between believers and a local atheist. My unconsidered response is no-one will

understand it unless we publish the full correspondence, and maybe not even then.

* * *

Our bimonthly dinner and discussion meetings are also something about which we're rather pleased. We've had a great range of speakers over the years and the future looks equally bright.

One good feature is that we've been able to get media interviews with our guest speakers, for every talk for the past two years.

Thanks to the topicality of my Nostradamus talk in October, I did four radio interviews and it also got a mention in the *Adelaide Advertiser*. I would have been happy if it had only got 8 column inches on page 11. But it got a full op-ed *Issues* page feature as well.

Maybe it was due to the eternal popularity of the subject.

One of the TV channels ran *Nostradamus: Millennium Alert*, yet another apocalypse warning preview, the week after my talk.

Actually much of the program seemed putting forward a combined Christian Fundamentalist End of World-Y2K-Global warming ecodoom view, causing some viewers to mutter "Why would anyone want to watch this, it isn't about Nostradamus."

* * *

On a similar thought, one of the less reliable journals (*Exposure*, *Nexus*, whatever) has stated the Third Secret of Fatima has been confirmed as a total Nuclear War before the end of the Millennium. So if doesn't happen this month, it will at least settle the argument about when the next millennium begins.

* * *

Ian Plimer covered the Global warming topic during the Convention. After Ian's presentation I was even less troubled by potential increasing world temperature than I had been previously. After the coldest November night since 1974, *Four Corners* ran a program on the appalling climate

doom of global warming. At the time I thought the program was a little over the top, but the full extent did not occur to me until I later reviewed *Nostradamus: Millennium Alert*. I feel asleep during *N:MA* (you would too), and when I woke up it took me some time to realize that I was now watching the *Four Corners* piece, which followed it on the tape I was using. They might have been using scientists and "public policy experts", instead of psychics, but the tone and style of the presentation was disturbingly similar. Right down to the inability to properly use the English language with full sense of the meaning of the words used.

A scientist on the *4 Corners* item, (without the slightest trace of irony) "The majority of the world's scientists are agreed (except for a very few people) ... that we are having incalculable effects on climate at the moment."

Think about that for a moment.

* * *

Meeting notices that arrived too late to get into WatsOnWare

February 2

Unhappiness is not Deprssion

Dr Sydney Bockner will point out the difference between unhappy moods and true depression and will discuss recent advances in treatment.

Dr Bockner is a Fellow of the Royal College of Psychiatry, Member of the Royal College of Surgeons, Member of New York Academy of Science, has a Diploma in Psychological Medicine, and lately consultant physician in psychological medicine.

He was on the staff of Guy's Hospital medical School & the Institute of Neurology of London University.

April 5

Dinosaurs. What do we know? And why do we want to know it?

Professor Roger Seymour of Adelaide University



New South Wails

Barry Williams

A bumper crowd turned up at the Chatswood Club on October 8 to enjoy a buffet dinner and to hear Ian Bryce give a talk "You Don't Have to be a Rocket Scientist". The talk was preceded by an hilarious routine by stand-up comic, Peter Lead, who exhibited all the knowledge of rocket science that one would expect from a law student, by persistently confusing the subject with pocket science, packet science and various other misunderstandings.

Ian Bryce, a member of the NSW committee, who really *is* a rocket scientist, showed that there is a lot more to his arcane craft than merely lighting the blue touch-paper and retiring to a safe distance. For instance, it may not be immediately apparent why, if a spacecraft wishes to catch up with another one ahead of it, it slows down,

but that is what happens and Ian explained why.

A vigorous question period followed and those who claimed the subject had gone "right over our heads" were cautioned against making bad puns.

As is becoming traditional at the conclusion of NSW dinner meetings, a couple of strolling magicians rounded off the evening with the sort of card manipulation that would have had them shot in Deadwood.

Given the success of this format, we will be conducting a programme of four dinner meetings next year at the same venue and details are in the WatsOnWare insert in this issue. Remember that the first one will be on Feb 5, before the next issue of *the Skeptic*, so please plan ahead.



Ian Bryce blasts off.



Don't play poker with this man: Steve Walker entertains guests after the NSW dinner.

ACT acts

Neil Woodger

In the wake of our successful representations to The National Science Centre (Questacon), our "biblio-sleuth", Peter Barrett, noted yet another questionable tome lurking with malicious intent on the Questacon gift shop shelves. It too was removed on request. The score so far is Skeptics two, gift shop manager nil. We ignored the (predictable) label of self righteous puritans burning idolatrous images, and trusted in the good sense of senior management.

As a follow up to this item, a South Australian reader wrote to us recently after he visited the National Dinosaur Museum in Canberra. He was concerned about the inappropriate references to creationist ideology in the form of notices near the displays. At the time of writing no one has had a chance to visit the Museum, but we promise our correspondent that a visit will take place. The Museum is privately run, so the options of political pressure, and/or bad PR, are more limited. At the very least, the management will receive negative feedback.

The group recently held its annual October dinner to commemorate Bishop Usher's cockeyed belief about the age of Terra Firma. The dinner was very successful thanks to the good food and the environment provided at the National Press Club. Our guest speaker, the highlight of the evening, was Richard Koscic from the NSW Police Academy at Goulburn. Richard told us about his research in criminal profiling, an emerging discipline whereby specialists try to predict the likely characteristics of an offender in a serious crime of violence. The research compared the efforts of several groups including psychologists, professional profilers, students, police detectives, and psychics(!). Our readers will be heartened to learn that the psychics performed at the bottom of the heap. They did their darndest, putting their hearts in to their work. The whereabouts of their brains was another matter altogether.

Finally, an unusual event witnessed recently – protesters outside the offices of the Church of Scientology in Canberra. Our reporter stayed well clear in case he was taken for a Church member and subjected to criticism (or worse!).



Letters

Big Bang and the need for a creator

In 'the Skeptic' (19:3 pp28 - 30) Justin Lipton states what he regards as the biggest problem with Big Bang theory: the problem of "what was there before the bang?"

I can suggest a number of points that may be of interest to him. The unit of time against which the age of the universe is measured is related to human experience on the planet Earth. Conceptually, when we speak of approaching the time of the big bang, we are still on Earth rotating around a sun. But big bang theory is intended to apply to our entire universe. There is no observer on an earth rotating around a sun disconnected from the rest of the universe able to watch the universe beginning and able to observe what happened before it began. Thus, big bang theory uses an ideal time scale. The universe may have a beginning with respect to this ideal time scale but to someone actually in the universe no such measure exists and they can no more reach the start of time than a curve can reach its asymptote. Thus, as I understand it, big bang theory proposes an infinite time regression ie, it proposes a universe that has no beginning. Perhaps more strikingly still, it can be argued that no matter how close physicists approach the beginning of time as measured against their ideal time scale they are still no closer to reaching the beginning of the universe, just as negative one hundred is no closer than zero to negative infinity.

I do wonder if the use, for example, of quantum mechanics in understanding the evolving universe is at all warranted and whether it is not like trying to play a gramophone record with a crowbar. Are we seeing speculative physics taking the place of metaphysics?

I do not share the atheist perspective in Justin's article on the need for a Creator. I think a much stronger position can be adopted. It would be nonsensical to be an a-drowist if one did not know what Drow was. Similarly it would be nonsensical to be an atheist if one did not know what Theos was. Atheists admit to having some passably consistent notion of God and too often they find themselves discussing God on the ground that godists have prepared for them. It is stronger, I think, to ask, "What is God?" than to say, "There is no God".

Readers are invited to submit letters on topics that take their Skeptical fancy. For our part, we reserve the right to edit letters for the sake of brevity, clarity or mere whim.

God the Creator is a myth that emphasises the power of God but it is useless as an explanation. The word 'create' concerns transformation. There is no requirement for the universe to have been produced from nothing (presumably Universe and Nothing) and it seems logically absurd to introduce (S?) something called God to effect it. Similarly, there is no requirement for the universe to have been designed. The argument that the universe is not designed is very different to the argument that it is disordered. Order need not imply design. And the introduction of a designer to explain order begs the question.

Were the concept of God the Creator to have explanatory power it might raise the prospect of us reaching the God of the gaps and enable us to fill some of the gaps in God. Perhaps this is the essence of the religious crisis - the desire of believers to have an active tangible God versus the desire of God's protectors to raise the barriers to 'him' infinitely high so that the idol's worthlessness is undiscoverable.

Justin's observation that 'both Hume and Kant have shown that it is impossible to prove or disprove God's existence' is a curious appeal to authority. I take it as implied by the sentence that Hume and Kant were of the view that one could prove or disprove the existence of something or Justin would not have bothered us with his observation. I take it also that both had a well-identified concept of God in mind. If these things are so then it highlights the point made earlier - what an extraordinarily well protected and empty concept God has become when it admits of no demonstration of 'his' existence.

**L. Trevanion
Canberra ACT**

Creator II

Justin Lipton's article "The need for a Creator : Higher order arguments" was extremely interesting and seems to me to highlight the essence of Skepticism. A good Skeptic can only form opinions about events in the world around them by linking pieces of evidence based on our best theories of cause and effect. Anything else is fantasising, albeit innocently, including belief in a creator.

In his article Justin examines the most fundamental question about the birth of our universe - how can something be created out of nothing? In other words, where is the linkage between cause and effect?

One paragraph in particular piqued my curiosity Justin writes "Quantum mechanics has also been invoked and while it can answer many unresolved questions such as how something can appear from nothing, it is often misused as a convenient explanation of the origin of our universe. Heisenberg's uncertainty principle allows a finite amount of energy to pop into existence for a finite time length, however the time/energy product is tightly bounded. It does not allow for something with as much energy as a universe to exist for any meaningful length of time."

It occurred to me that there may be a very improbable but not impossible chance of a self-replicating piece of energy materialising out of the quantum void (whatever that is). If this thing had a replication time of 10^{-34} seconds or so (the Planck time Justin cites) then the observable universe ie that based on cause and effect would inflate exponentially for a short time until the quantum energy ran out. From then on it would just keep expanding and cooling.

Could Justin or any other interested reader tell me whether I'm fantasising or theorising about the origin of cause and effect, and what's the difference when considering the unobservable?

**Matt Hennessy
Parkville VIC
mhen@ozonline.com.au**

Ritz again

Dr Robert Hanan's letter in the last *Skeptic* misses the point I have made about Ritzian theory. My point was intended to illustrate that differences in clock readings were not necessarily time dilation, but could be attributed to other causes. I was not trying to *prove* anything - I was merely trying to show there was an alternative way of looking at things.

I'll review the situation in more detail. According to Newtonian theory, a pendulum swings with a frequency proportional to the square root of the gravitational acceleration divided by the length of the string. In other words, the more gravity we have, the more rapid will be the oscillation.

So, according to Newtonian theory, we have a slower oscillation atop a mountain because the acceleration due to gravity is smaller. However, if we could compare the rates of oscillation between the two pendula with enough resolution, according to Relativity we would not have a result in agreement with Newtonian theory. According to Relativity, time runs more slowly in a stronger gravitational field. So, the pendulum atop the mountain would run slower because of the effect of gravity on the pendulum's rate, but not as slow as we would expect because of the effect of gravitational time dilation. However, this difference could be attributed to time dilation, or a more subtle effect of the gravity on the oscillation frequency.

Dr. Hanan outlines how relativity and the principle of equivalence can explain this component of the difference of time readings. I never said that it could not. I was pointing to the possibility of an alternative explanation of that difference. I'm puzzled as to why Dr Hanan would think so.

I said in my letter : "Relativity is messy, I'm not sure I would say self contradictory". In other words it fits together - but it is a messy fit. Dr. Hanan notes that you cannot measure this time difference with pendula, but must presumably use objects such as atomic clocks. Atomic clocks depend on quantum oscillations, and could be susceptible to a gravitational analogue of the Zeeman effect. Atomic clocks, not pendula, are the oscillators which would be affected by such an effect. But I used pendula as the basis for an example, because I needed an illus-

tration of what atomic clocks could do which people could readily grasp.

Writing such a letter is difficult - I cannot explain things with the detail I would like, as people would necessarily turn off. I had to throw a lot of things out of the last letter, and even then the trade off I made was not satisfactory - witness Dr. Hanan's misunderstanding.

Dr. Hanan's comments about questioning Einstein fly in the face of what Skepticism is all about, and really only amounts to "how dare you question Einstein?". Surely that is not the right way to approach matters.

But, I would like to thank Dr. Hanan for taking the time to disagree with me. It is so easy to attack "soft targets" like astrology and mysticism, and Dr. Hanan clearly sets his sights higher.

John August
North Ryde NSW

More Ritz

I find Dr Robert Hanan (*Letters*, 19:3) makes a glaring error, and only confuses the issue, when discussing time dilation due to relativistic effects. A pendulum atop Mt Everest swings slower than at sea level mainly due to classical Newtonian mechanics. On the Moon for example, where gravity is 1/6 that of Earth, the period of swing would be about 2.5 times that on the Earth. An Earthling however, would not age 2.5 times faster than a moon dweller. Take the extreme case of a pendulum clock on the Mir Space Station. As gravity has no effect in orbit, the pendulum would not even swing!

Clearly, a slower pendulum is not a sign of time dilation as Dr Hanan asserts. It is simply a measure of the strength of the local gravitational field. A wind-up, quartz or atomic clock atop-Mt Everest would all show the correct local time. Luckily for the people of Tibet!

My guess is that the real differences in time rates (due to relativistic effects) between sea level, Mt Everest, the Mir Space station and the Moon, would be of the order of a few seconds per year. Maybe a physicist out there could do the relevant calculations for us.

A Flatow
Monterey NSW

Afrocentrism

I thank Soressa M Kitessa for the comments made (*Letters*, 19:3 pp 65-66). However, they seem to me to have rather little force. Some of them may derive from confusion, misunderstanding of my comments, or misapprehension of my motives.

Although many schools of thought have extreme fringes, Afrocentrism is particularly skewed in this direction. As readers will have gathered, the material I reviewed is relatively sober by Afrocentrist standards. Nevertheless, it is still highly implausible and largely unsupported by evidence.

If articles are to be of reasonable length, grouping of similar entities under cover terms such as *fringe* and *mainstream* is often necessary. There is no sinister motive here, and I naturally do not suggest that either category is monolithic or that there are no borderline cases.

The term *mainstream* here does NOT refer to views held by 'the masses', but to the published ideas of careful scholars. These authors have 'run the gauntlets' of rigorous training and examination, peer review and post-publication criticism. Even so, I do not deny that their views MAY still be mistaken. However, unless there are many major points of dissent or clear errors, the burden of (dis) proof surely rests with the fringe.

Searching for bias in existing material (including mainstream material) is entirely appropriate, and much older material does indeed display anti-African bias. However, as is well documented, Afrocentrists have, overwhelmingly, done little but substitute new bias for old (as their very title suggests). A key goal of scholarship (*pace* the postmodernists) is to emancipate oneself, as far as possible, from such biases. Scholars' own ethnic affiliations should not be an issue. Incidentally, Bernal, one of the best-known Afrocentrists, is a white British Jew.

I did not comment critically on the Africana [sic] Studies and Research Center [sic] at Cornell, but on two departments at Temple University. Neither did I complain that the Temple University material has not been 'critically evaluated by "mainstream" scholars'.

Mainstream scholars DO concern themselves with African Studies; there is a vast body of non-Afrocentrist

work on these matters, and thus no shortage of expert opinion. SMK appears confused here.

SMK also appears confused about my comment about the dilution of scholarship in departments of African Studies and the like. In a 'normal' university humanities department, researchers/teachers have been thoroughly trained in the relevant discipline, eg, History, before publishing seriously on the affairs of particular ethnic groups. This does not, of course, preclude cooperation with specialists in other disciplines. In contrast, many academics and graduates from departments of the type to which I referred have apparently had only a superficial exposure to a wide range of disciplines. In consequence, they often make very basic errors, such as the errors in linguistics which I identified. If members of my department made such errors their careers would rightly be brief. The main issue is the demonstrable lack of depth in the training of the individual 'scholars'. There ARE some broad-based departments which do manage to avoid this, but these are generally too sound to be involved in aberrations such as Afrocentrism.

Mark Newbrook
Monash University

Energy needs

The latest issue (19:3, p.19) presents a well-reasoned contribution toward solving the greatest problem Australia (and the rest of the world) will need to solve in the forthcoming millennium; that of adequate energy supply, particularly for transportation. Unfortunately Dr Chia's "There's no fuel like an old fuel" is spoiled by perpetuating several of the false claims that have been irresponsibly spread by tediously vocal anti-nuclear zealots.

First the statement "Radioactive plutonium is one of the most toxic substances known." This is completely untrue, despite being endlessly and widely repeated. In actual fact plutonium is far from being one of the most toxic radioactive substances. The worst is naturally occurring actinium-227, which, compared with plutonium-239, gives more than 10,000 times the effective dose per unit mass when inhaled and 3,000 times more when ingested. Next in danger poten-

tial come the isotopes thorium-229 (so be careful with those gas mantles when you go camping) and radioactive lead-210 (not lead-208, which is stable). And there is radium, a highly active (and dangerous) element which was widely used in cancer clinics until better (and safer) therapies became available. Also we have the isotopes protoactinium-231, uranium-232 (a uranium isotope produced from thorium) and curium-248 which rank well ahead of plutonium in toxicity. And don't overlook the artificial radionuclide americium in household smoke detectors! No, plutonium isn't even in the top ten of toxic radionuclides. To assert otherwise is a downright lie.

Then there is the matter of chemical toxicity, where plutonium is hardly in the running. And as for biological toxins the contrast hardly bears thinking about. Plutonium is positively benign by comparison with such nasties as botulin or anthrax. It is often stated (falsely) by anti-nuclear lobbyists that half a kilogram of plutonium is sufficient to kill every human being on earth.

Consider that before the cessation of atmospheric nuclear bomb tests in 1963 somewhere between five and six tonnes (yes, over 5,000 kilograms) of plutonium was released into the atmosphere, where it has dispersed (in its supposedly most dangerous form!) all around the globe. Since we are not all keeling over like Morteined flies something doesn't quite add up.

The author moves on to "the thorny unresolved issues of disposal of nuclear waste, decommissioning of old nuclear plants ... and potential acquisition of materials by terrorists for bomb building..." Three furrphies in one sentence. I should direct Dr Chia's attention to an article of mine in an earlier issue of *the Skeptic* (17:3, p.16). Disposal is a political problem (made worse by anti-nuclear activism) not a physical one. Three distinctly different disposal methods are available: vitrification, encapsulation and mineralisation (Australian Synroc).

As for decommissioning, it's no big deal. Over seventy reactors have been, or are in the process of being, restored to green-field status. And the terrorist problem is one for the terrorists because of the enormous difficulties they would face in stealing, transporting, separating, enriching and processing the desired material. They would have better odds hijacking an ex-Soviet nuclear weapon ready-made.

Apart from the above aberrations, Dr Chia does a service in drawing attention to the difficult problem of portable fuels for future transportation needs when the oil runs out. Fossil fuels must be conserved for future generations and not spewed up chimneys as carbon dioxide to produce vital electricity that should be better supplied by safe nuclear reactors.

Colin Keay
New Lambton NSW

Nostradamus

I was rather amused at the tone of the articles on Nostradamus in *the Skeptic* (19:3) and I'm sorry to have to dampen some of the euphoria.

But first let me make it clear that I fully agree with the general thrust: that Nostradamus is hardly a reliable guide to the future. By his own admission, his predictions were based on a combination of astrology and divine inspiration. Personally, I lump most books on Nostradamus in the same category as books on the location of Noah's Ark or ancient Atlantis, and books that find a hidden code in the Old or New Testament.

But you have to be fair to the old seer.

Steve Roberts says that July 1999 is "one of the few specific dates" mentioned by Nostradamus. Now that in itself should have set the alarm bells ringing. Nostradamus rarely, if ever, means what he appears to say. In a letter to his son Caesar prefaced to the first edition of his *Prophecies*, he states plainly: "I was willing for the common good to enlarge myself in dark and abstruse sentences, declaring the future events ... all under dark figures."

In his *The Complete Prophecies of Nostradamus* (NY 1949), Henry C. Roberts, in notes to quatrains VI:2 and X:91, states that "Nostradamus commences his count of time from AD325, the date of the Council of Nicaea." (He doesn't say how he knows this, or why Nostradamus did it.) Oddly enough, he takes the 1999 in X:72 literally - but to be consistent, $1999 + 325 = \text{AD } 2324!$

On the other hand, David Ovason, in *The Secrets of Nostradamus (The Medieval Code of the Master Revealed in the Age of Computer Science)* (Century, London 1997), calculates by arcane reasoning based on astrology, numerology and the "Green Language" (!) the date to refer to AD 2087.

But whether either fellow is right or wrong, or whether we take the date literally, one thing is absolutely certain: as Trevor Case points out, Nostradamus specifically states (in the letter referred to above) that his predictions extend to the year 3797 (+ 325?). (Something that seems to have escaped the notice of the designer of the front cover.) Yet some commentators (eg, Roberts, and J.H. Brennan, in *Nostradamus: Visions of the Future*, London 1992) still interpret I:48 as forecasting the end of the world in AD 7000!

So, my dear fellow Skeptics, your gloating was somewhat premature - maybe you should have delved a little deeper!

Alan Towsey
Tahmoor, NSW

Just Poppin' Along

Attentive readers may have noticed a difference of opinion between Scott Campbell and myself in the last edition of the magazine. This spilled over into the skeptics email discussion group where it became necessary to issue a 'batshit alert' so that other people can delete potentially offensive contributions without need to download them. Those who wish to pursue my ideas can find them on my web site at <http://zap.to/rafechampion>

Among other items there are two pieces from *the Skeptic* circa 1993, written to explain why it is important to take notice of some ideas from Popper and Bartley so that we can undermine the creation scientists and other irrationalists at a deep level. The aim is to drain the swamp of unreason and not just contain it in places while it leaks out elsewhere.

One would hope that the philosophers would have something to contribute to this task by promoting critical thinking but it seems that the opposite is the case. Philosophy this century has been in the grip of various fads and fashions which have generally reduced rather than enhanced the capacity for critical and original thought. For this reason it seems that the professional philosophers will be among the last people on earth to appreciate what Popper and Bartley have to offer.

Three errors stand out.

1. Overindulgence in conceptual analysis and obsession with the mean-

ing of terms. For more on this, see "Essentialism and the Organic State" on my web site.

2. The quest for truly justified beliefs which turns out to be unobtainable in principle (due to the dilemma of "the infinite regress versus dogmatism"). For more on this, see Bartley on rationality, on the site, also the book review on Constructive Deconstruction.

3. Concentration on subjective beliefs instead of scientific or objective knowledge. For more, see "Objective Knowledge" on the site, also "The Kind of Literary Criticism we Need".

These errors have contributed to a situation where students either passively take on board whatever they are taught, or if this is too boring (like the inductivist philosophy of science) they seek superficially more exciting diversions such as post modernism or "issues-oriented" courses on environmentalism, feminism etc.

My response is to promote the thoughts of Popper, Bartley and Hayek. Of course this needs to be done in a critical and light-hearted spirit because they are not beyond criticism, they merely need to be taken into account by people who are serious about the main lines of modern thinking in philosophy and the human sciences.

Rafe Champion
Cremorne NSW
<http://zap.to/rafechampion>

Popper again (sigh)

I was disappointed to see Rafe Champion championing the latest edition of Alan Chalmers' awful text book *What Is This Thing Called Science?* Enough damage has already been done to students around the world by the first two editions of this ham-fisted volume, which was written by Rafe's former supervisor and the one-time head of the radical Marxist-cum-postmodernist Department of General Philosophy at Sydney University. (This department was spawned by the early -70's revolt against science and reason, when the revolutionaries in the Philosophy department split from the traditionalists to form their own little fantasy world - for more background, see *Quadrant* v.43 No.4, April 1999.)

The irrationalist sub-Popperian view of science that is manifest in everyone of the chapters in this book is a

million miles away from that of Skepticism, and would be far more at home in a radical sociology of science course, where they also take the likes of Kuhn and Feyerabend, and the sort of quasi-Marxist analysis that Chalmers spouts, seriously. They also wouldn't have a problem with Chalmers' anti-realist view that science cannot describe the world, but I suspect plenty of skeptics would. This is a book I heartily recommend passing over, unless you think, as Chalmers does, that the persistence of a scientific theory has more to do with society than how close it gets to the truth.

Scott Campbell,
University of New South Wales

Fluoridation

Bob Entwistle (*Letters*, 19:3) commented on a meeting of the Queensland branch which I reported in the 19:1 issue (not 19:2, as Bob's letter gives, but perhaps the error was introduced later).

Bob says that it is "patently absurd and unworthy of a Skeptical gathering" to have two pro-fluoride speakers and none to provide the persuasive counter-arguments. I am not involved in the programming of speakers, but I feel that it is not patently absurd. The Queensland Skeptics has had, among others, a chiropractor, a reiki practitioner, a nonbeliever in UFOs and a proponent of evidence-based medicine speak at our meetings and I don't recall anyone requesting that a person of the opposing viewpoint should also speak at the same meeting.

I'd like to think that we are mature enough that each meeting does not always require equal representation and equal time for opposing views. The Queensland president is aiming to have a range of speakers with diverse viewpoints over time.

I would imagine that it is difficult enough to get some speakers, but the hassles of always having to find a person of opposing view to speak on the same night doesn't bear thinking about. Maybe, as Bob suggests, speakers for the anti-fluoridation view would have been easy to find, so perhaps our president will follow them up for a later date. In my experience, having opposing speakers at the same venue is often less interesting because

the meeting degenerates into unproductive arguments.

I won't comment on Bob's discussion of fluoridation, as it is outside my area of knowledge, except to say that I wonder if all options are being considered when he says, in relation to fluoride above a therapeutic level, "It follows that the only possible effect for most people is harmful." Wouldn't there be a dosage in between therapeutic and harmful which is neither?

Michael Vnuk
Woolloongabba QLD

Language

To James Gerrand, (*Letters* 19:3, p 65), two points:

Gerrand is right to say that specific first languages are acquired rather than genetically inherited; but his choice of this kind of case as an example of the shared heredity of twins is unfortunate. ALL normal humans acquire full fluency in their first languages/dialects (this includes native speakers of non-standard/stigmatised dialects, who are just as fluent in those dialects as others are in standard dialects). The species is very largely uniform in this respect. Hence, similarities in level of first-language fluency cannot relate to closeness of genetic relationship. Gerrand should instead have selected a characteristic which varies significantly across the species.

Not for the first time, Gerrand's treatment of the Mead-Freeman issue appears highly partisan and one-sided. Freeman may perhaps be largely right, but he is not the academic/skeptical equivalent of a saint, which is how Gerrand seems to see him. Specifically, I am at a loss to understand Gerrand's view of Freeman as the embodiment of patient restraint in the face of (allegedly unreasonable) opposition. Freeman's manner often appears highly abrasive to me, and he does not seem very tolerant of scholarly criticism, which is especially unfortunate in the context of such a complex debate.

Mark Newbrook
Monash University

About our authors

Peter Bowditch is a computer specialist who expects to make his fortune planning for the Y3K bug. He is a newly inducted member of the NSW committee.

Damien Broderick, a Melbourne academic, is one of Australia's most successful and best known science fiction authors and critics.

Richard Buchhorn is the treasurer of Qld Skeptics. He once trained for the priesthood but decided that celibacy was for the birds - extinct birds we presume.

Richard Cadena, a member of the Vic committee, is a computer specialist planning to make his fortune solving the Y4K bug.

Susan Cluett works in the airline industry and is studying psychology.

Paul Davies, visiting Professor at Imperial College, London and Honorary Professor at the Uni of Qld, is one of the world's best known physicists and is the author of many books explaining science to lay readers.

James Gerrand is a member of Vic Skeptics and a former aviation consultant.

Colin Groves is a Reader in Anthropology at ANU and a member of ACT Skeptics.

John Happs, president of WA Skeptics, is an education consultant.

Helen Lawrence, from Tasmania, is a physiotherapist who has just completed a BA in which she studied anthropology.

Richard Lead was once named Umberto Uranium, but he became degraded. Despite this, he is the treasurer of NSW Skeptics.

Tim Mendham, a cunning cryptic crossword compiler, is a former editor of *the Skeptic*. So that's the next step in the downward slope?

Mark Newbrook is both a Vic Skeptics committee member and a crafty linguist at Monash.

Bob Nixon is chief investigator for *the Skeptic* and is a member of the Vic Skeptics. He rarely wears a hat and is thus suspect.

Ian Plimer is a man who needs no introduction.

Steve Roberts, scientist, trivia lover (or is that trivial?) and Vic Skeptic is responsible for the WatsOnWare insert. All complaints will be ignored.

Rosemary Sceats, the Bard of Macleod, admits to liking her tucker. She would like to thank Albrecht Durer for his invaluable assistance.

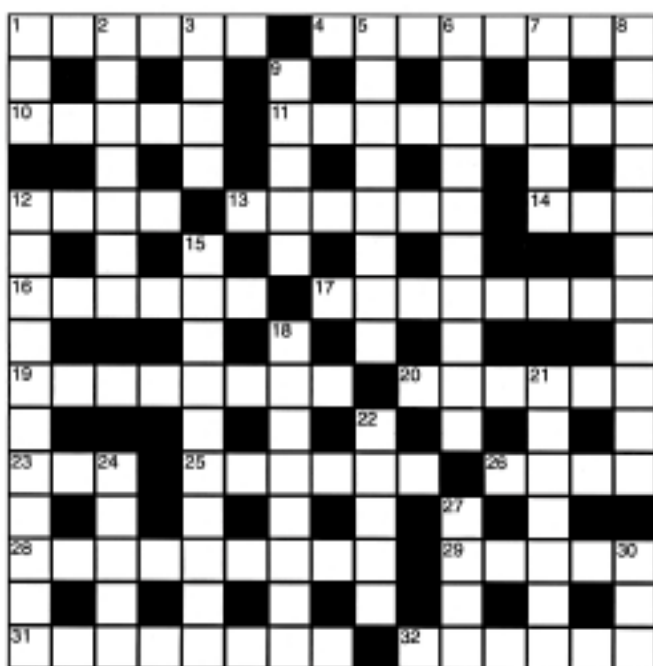
Bob Steiner, accountant and magician (or vice versa) is a prominent member of the US Skeptical movement.

Barry Williams, darling of the international jet set, is glad to be home.

Photographs used in this issue were supplied by **Peter Carter, Richard Lead & Roslyn Fekitoa**. Thanks.



The Skeptic Cryptic Crossword No 5 - Summer 1999



Return to: Skeptic Xword
PO Box 268, Roseville 2069

Name: _____

Address: _____

Entries will not be opened until Janusry 31 and the first correct entry opened will be the winner. The prize will be a book by Richard Dawkins.

Solution to Crossword No 4



The winner of of Crossword No 4, and a copy of Richard Dawkins' *Climbing Mount Improbable* is Shane Reeves of Burwood East in Victoria.

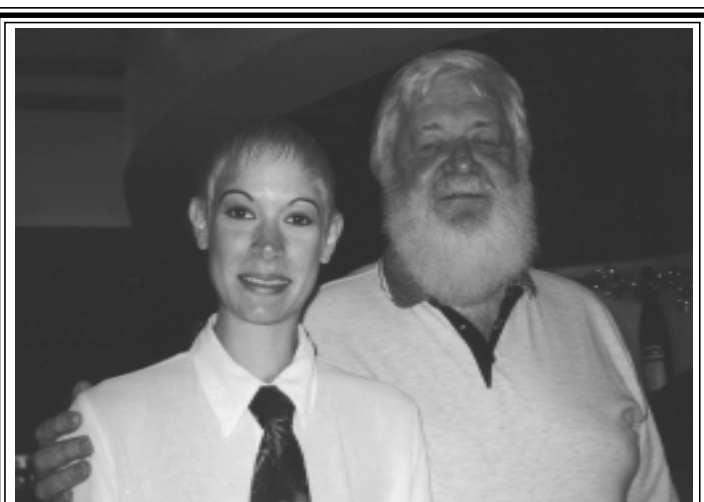
With the holiday season upon us we expect to be even more whelmed than usual with entries and will be employing extra staff to cope with the flood (no, not *that* flood).

Across

1. Vacuous era seen each morning in a Melbourne paper. (3,3)
- 4.& 8 down. 1 across will dawn when the orchestras get together. (8,11)
10. Eliot after a decade under canvas. (5)
11. A very large mythical number in a charged particle with a medicinal plant. (9)
12. Runs out of Asian ball bearings? (4)
13. Flinders found among the pyramids north of Brisbane. (6)
14. The night before the all-Asian final? (3)
16. Grab the law officer in a muddle. (6)
17. Elementary physics of male sexuality? No, much fruitier. (8)
19. You can expect much frenzy about 6d in this year. (8)
20. Melting, so I have fun. (6)
23. Mysterious ship reversed into ship of Ulysses? (1-1-1)
25. Adjacent to HM? No, closer. (6)
26. In the midst of waters the confused land lies. (4)
28. Look out and retain your ticker. (4,5)
29. Corporate symbols of the word of God. (5)
31. Wrenches help to cross the gap. (8)
32. Jerk is a blockhead with high honour. (6)

Down

1. Seedy head case. (3)
2. Ulysses' Aeolian container is somewhat prolix. (7)
3. Creationist involved in statement that lying is habitual. (4)
5. Tank of the emerging age? (8)
6. Nine mil. Add a micrometre to see if that's a long time. (10)
7. Gullible indiginee went without tea. (5)
8. see 4 across.
9. Yankee bums' beasts of burden. (5)
12. Richter falsely equates shark with shivers. (11)
15. A laden pawn made to look sickly. (4,3,3)
18. Stride as though it's a catastrophe. (8)
21. Visible understanding? (7)
22. The. .. French ... the... river... Sorry, I've forgotten. (5)
24. Musical work of ages. (5)
27. Run loud and deep. (4)
30. Bum note initially heard in the Sydney Opera House. (3)



**Compliments of the season to all our
readers from Santa and his helpers.**