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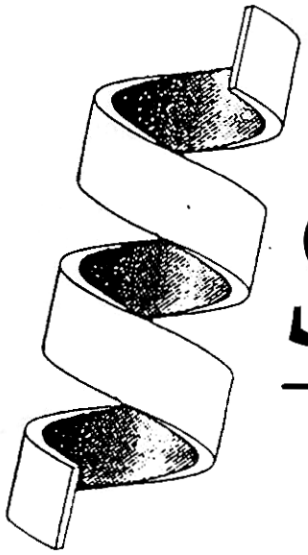

NEW ZEALAND SKEPTIC

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How Thinking Goes Wrong

Michael Shermer

This is the second half of the article begun in the last NZ Skeptic.

The article originally appeared in the excellent US magazine Skeptic, *edited by Shermer, (Vol 2 No 3) and also forms Chapter 4 of Shermer's book* Hope Springs Eternal: How Pseudoscience Works and why People Believe in It.

Representativeness

Seemingly unusual events must be considered for their representativeness of that class of phenomena. In the case of the "Bermuda Triangle", where ships and planes "mysteriously" disappear, there is an immediate assumption that something strange or alien is at work. But we must consider how "representative" the event is in that area. There are far more shipping lanes in the so-called "Bermuda Triangle" than in surrounding areas, so accidents and mishaps are more likely to happen in such an area. (As it turns out, there are actually fewer accidents in the Bermuda Triangle, per rate of traffic, than in surrounding areas. So these areas should be called, perhaps, the "Non-Bermuda Triangle." See Kusche, 1975, for a full explanation of this solved mystery.)

Similarly, in investigating haunted houses we must have a baseline representative measure of noises, creaks, and other events before we can say that an occurrence is unusual (and therefore "mysterious"). I used to hear rapping sounds in the walls of my house. Ghosts? Nope. Bad plumbing. I occasionally hear scratching sounds in my basement. Poltergeists? Nope. Rats. One would be well-advised to first rule out worldly explanations before turning to other-worldly ones.

Failures are Rationalised

In science the value of negative findings - failures - cannot be overemphasised. Usually they are not wanted, and often they are not published. But most of the time failures are how we get closer to the mark of truth. And honest scientists will admit error because they know that their fellow scientists will publicise their errors, especially since they have had their share as well. Not so ⇒ p3

CONTENTS

Editorial: On Experts and Walls

Surely the Kaimanawa Wall story was one of the great beat-ups of all time. Here was a natural rock outcrop, which experts immediately told us was of a kind common in the area, raised to status of "great mystery" and worthy of the other "X Files puzzles" of Easter Island, South America and so on.

The few scientists who were allowed to have their say were presented as churlish spoil-sports who seemed determined to let boring facts get in the way of an exciting story.

On the other hand television gave the short gnomish man, who called himself an archaeologist, the full "personal profile" treatment. He swaggered up the road, swinging his stick, finally gazing in awe at his great mystical discovery. The problem was that he lost his credentials when, on the Kim Hill show, he said that this pile of rocks was:

> *Typical of so many ancient walls, such as those at Easter Island and the Egyptian Pyramids, which have been made with precision which we cannot understand or comprehend. [Paraphrased]*

Actually, anyone with a passing interest in archaeology knows exactly how the statues at Easter Island were erected. There are photographs of contemporary islanders showing how their ancestors did it.

Anyone with a passing interest in architecture and archaeology knows exactly how stones can be cut and stacked with such precision that you cannot slide a knife blade into the slots. The rocks are cut with a bevelled back bottom face so that the front edge presents a knife edge to the rock below. You fill the gap with rubble, slide the rock back and forth a few times and you have the mysterious "perfect" joint.

Anyone with a passing interest in archaeology and architecture can tell you exactly how the pyramids are built on a base which is level to an accuracy which is unobtainable with an optical theodolite. The Egyptians dug a square trench using a 3,4,5, measure and filled it with water. Not surprisingly the water is remarkably flat. Many of still use water levels within a plastic hose to level our building platforms. They are more accurate than a theodolite over a long distance, but the theodolite is much more convenient — and does other jobs as well.

The ancients were just as intelligent as we moderns and applied that intelligence to stone building with the same vigour and imagination that we apply to making silicon chips. No one says we must have had help from aliens from outer space to make silicon chips, and yet some are so arrogant as to suggest that aliens must have helped the Egyptians and Easter Islanders. It's a curious form of "ancientism racism evolutionism." Give credit where credit is due. Those ancient folk were smart stone builders.

But how the story survived even five minutes is the great mystery. After all, New Zealand has its fair share of masons and block layers. We were being told that this wall was the product of some great ancient civilisation. And yet the vertical joins were not staggered. Now a child soon learns that if you build a wall with blocks you must stagger the vertical joints; otherwise the wall has no resistance to horizontal shear — it will fall over, possibly on the builder. So how come these masters got to the stage where they built with ten tonne boulders without learning the first lesson of building with blocks?

Surely some block layer would have telephoned TV news or Radio New Zealand or their local newspaper to explain this simple fact of life.

If my experience is anything to go by they probably did — and were ignored. Within a few hours of the claims being made I faxed radio and television, as the editor of this magazine, setting out the story outlined above. I received no response and the beat-up carried on for another week or so.

This is a floppy disc. If at all possible, please send articles on an **IBM-compatible disc** in ASCII text, Word or WordPerfect formats, or **email** them (address at right). Discs will be returned if clearly labelled.

Please indicate publication and date of any clippings.

Deadline for next issue: **1 August**

Contributions should be directed to:
Owen McShane, *NZ Skeptic* Editor
50 Te Ahu Ahu Road
RD1 Karekare, Auckland 7
Email:omcshane@deepthnk.kiwi.gen.nz

I suspect that block-layers and stone-masons rushed to give their evidence but were quietly ignored.

I suspect the scientists were given air time because they are always suitably cautious and diffident while they wait for the evidence to come to hand. On the other hand the block layers might have been uncomfortably forthright in their assessment of the skills of this stupid "ancient civilisation".

The sad thing is that the people of genuine ancient civilisations were genuinely smart. They had no need of aliens to create their great monuments. Our great arrogance is to place a junior reporter in front of something old, and if they cannot figure out how it was done in five minutes, then it must be a mystery, because it is obviously beyond the intellectual power of mere mortals. Do they ever wonder how well the same junior reporter would succeed in understanding the workings of a silicon chip?

with pseudoscientists. Failures are ignored or more often rationalised, especially when exposed.

If they are actually caught cheating - not a frequent occurrence - they claim that normally their powers work but not always, so when pressured to perform on TV or in a laboratory, they resort to cheating. If they simply fail to perform, they claim any number of creative reasons: too many controls in an experiment cause negative results; the powers do not work in the presence of skeptics; the powers do not work in the presence of electrical equipment; or the powers come and go, and this is one of those times they went. Finally, they claim, if skeptics cannot explain everything, then there must be something paranormal, falling into the *unexplained is not inexplicable* fallacy. It is rare for any of us to say "I was wrong." Rationalisation is less painful to the ego.

Remember Hits, Ignore Misses

This fallacy is a classic among psychics, prophets, and soothsayers, who make hundreds of predictions on January 1 and then tally up the handful of "hits" at the end of the year (mostly generalised, sure-bet types like "there will be a major [not defined] earthquake in Southern California" or "I see trouble for the Royal Family"). The next year they publish their hits and ignore the misses, and hope no skeptics bothered to keep track.

When a psychic makes statements about a person, they usually do so in the format of lots of questions. But this fallacy has a subtler effect on us all. We are startled when we go to the phone to call our friend, and it rings with a call to us from that same friend, because we have forgotten how many times the friend did not call under those circumstances, or someone else called, or the friend called but we were not thinking of him or her, and so on.

As Aristotle said, "the sum of the coincidences equals certainty". Because we forget most of the insignificant coincidences, the meaningful ones are remembered, the meaningless ones ignored. We must be always vigilant to remember the larger context in which the seemingly unusual event occurred.

Burden of Proof

Who has to burden to prove what to whom? Herein lies the social nature of science and knowledge. The person making the extraordinary claim has the burden of proving to the experts and to the community at large that his or her belief has more validity than the one almost everyone else accepts.

It works a bit like a democracy. You have to lobby for your opinion to be heard. Then you have to marshal experts on your side so you can convince the majority to "vote" for your claim over the one for which they have always voted. Finally, when you are in the majority, the burden of proof switches to the outsider who wants to challenge you with his or her unusual claim.

The burden of proof is on the creationists to show why the theory of evolution is wrong and why creationism is right, not on evolutionists to defend themselves. (Evolutionists had the burden of proof for a half a century after Darwin and now enjoy the reversed roles.) The burden of proof is on the Holocaust revisionists to prove the Holocaust did not happen, not on Holocaust historians to prove that it did. The burden of proof is on Eric Lerner to prove the Big Bang never happened, not on cosmologists to prove that it did (though this has only very recently made the shift).

This is the price you pay for being an outsider, regardless of whether you are right or wrong.

Logical Problems in Thinking

Emotive Words and False Analogies

Emotive words are used to provoke emotion and obscure

rationality. They can be positive emotive words - motherhood, America, integrity, honesty. Or they can be negative emotive words - rape, cancer, evil, communist. Politicians are masters at this fallacy, talking about inflation as "the cancer of society", or industry "raping the environment". Similarly, metaphors and analogies can be powerful tools of language, but they can also be misleading when they redirect thinking into emotions or down an irrelevant path.

In the 1992 Democratic nomination speech by Al Gore, for example, he constructed an elaborate analogy around the story of his sick son, holding him in his arms as he hovered on the brink of death, and finally tending him back to health. He made constant references to the sick country, America, hovering on the brink of death after 12 years of Reagan/Bush, now to be nurtured back to health under the new administration. It is a powerful tool of language that can cut both ways, for or against.

Ad Ignorantiam

This is an appeal to ignorance or lack of knowledge, and is related to the *burden of proof* and *unexplained is not inexplicable* fallacies, where someone might argue that if you cannot disprove a claim, it must be true. For example, if you cannot prove there is *not* psychic power, then there must be.

The absurdity of this argument would be clear if one argued that if you cannot disprove Santa Claus, then he must exist. You can also argue the opposite in a similar manner. If you cannot prove Santa Claus, then he does not exist. Proof comes from positive evidence in support of a claim, not lack of evidence for or against a claim. In either case, an appeal to ignorance gets us no closer to the truth.

Ad Hominem and Tu Quoque

Literally "to the man" and "you are another", these fallacies misdirect thinking from the idea to the person holding the idea (and, in a defensive posture, to accuse the accuser of the same thing). The goal is to discredit the claimant in hopes that it will discredit the claim. Calling someone an atheist, a communist, a child abuser or a neo-Nazi does not in any way answer the specific challenge.

It might be good to know if someone is a particular religion or holds a particular ideology, in case this has in some way biased their research, but refuting claims must be done directly, not indirectly. If a Holocaust revisionist, for example, is a neo-Nazi or an anti-Semite, it would be good to know because this would certainly bias them in their selection of historical events to emphasise or ignore. But if they are making the claim, for example, that Hitler did not have a master plan for the extermination of European Jewry, to just say "Oh, he is saying that because he is a neo-Nazi" does not refute the argument. Either Hitler had a master plan or he did not, and this question can be settled historically.

Similarly with *tu quoque* - if someone accuses you of cheating on your taxes, to answer "well so do you" is not an explanation, although it might be construed as a reasonable defence against an ad hominem attack. (Try that your next audit!)

Hasty Generalisation

In logic, the hasty generalisation is a form of improper induction. In life it is called preju-

Donald Rooum, *Skeptic (UK)*

dice. In either case, conclusions are drawn before the facts warrant it. Because our brains evolved to be constantly on the alert to find connections between events and underlying causes of phenomena (to help us survive), this fallacy is one of the most common of all. A couple of bad teachers are generalised to an unworthy school. A few bad cars are inferred to mean that brand of automobile is unreliable. A handful of members of a group are used to judge the entire group.

In science, we must gather as much information as possible before announcing our conclusions. This is why Alfred Kinsey collected data on over 10,000 men and women before releasing his startling conclusions about human sexual behaviour. Kinsey has been accused of many things, but hasty generalisation is not one of them.

After-the-Fact Reasoning

Also known as *post hoc, ergo propter hoc*, this fallacy is related to the *coincidences are not causation* fallacy, where the reasoning is literally "after this, therefore because of this." At its basest level, it is a form of superstition. The baseball player does not shave and hits two home runs. The gambler wears his lucky shoes because he has won with them in the past.

More subtly, scientific studies can fall prey to this fallacy. In 1993 a study found that breast-fed children have higher IQs. There was much clamour over what in mother's milk could increase intelligence. Mothers who bottle-fed their babies were made to feel guilty. But soon after, researchers began to wonder if perhaps breast-fed babies were attended to differently, or if maybe nursing mothers spent more time with their babies and that motherly vigilance was the cause of higher intelligence. As David Hume taught us correctly, the fact that two events follow each other in sequence does not mean they are connected causally. Correlation does not mean causation.

Opposition Fallacy

If the opposition is for it, we should be against it because they are wrong about other things. This is a particularly susceptible fallacy for skeptics, because we tend to think that people who believe in the paranormal are incapable of right thinking in other areas. This may be true in general, but it certainly is not in particular. Many good scientists, for example, have been easily duped by clever magicians or flim-flam artists into believing any number of wacky claims. Alfred Russell Wallace, who co-discovered natural selection as the prime mechanism of evolutionary change, also believed in spirits, ghosts, and the afterworld. If we were to discount all of his thinking because of these beliefs, we would be missing a lot of good thoughts.

Genetic Fallacy

This is an appeal to the genesis or source of an idea to support or destroy it, and it goes in two directions: (1) the source of an idea is a recognised expert; (2) the source of an idea is a recognised quack. In other words, *who* is making the claim makes all the difference. If it is a Nobel laureate making the claim, we take note because he or she has been right in a big way before. If it is a discredited scam artist, we give a loud guffaw because he or she has been wrong in a big way before. While this is a useful screening tool for separating the wheat from the chaff, it is dangerous in that we might either (1) accept a wrong idea just because it was supported by someone we respect (false positive), or (2) reject a right idea just because it was supported by someone we disrespect (false negative). How do you know which is which? Examine the evidence.

Either-Or

Also known as the *fallacy of negation* or *false dilemma*, this is the tendency to dichotomise the world so that when you discredit the one, the observer is forced to accept the other. This is a favourite tactic of the creationists, who claim that life was *either* divinely created *or* evolved. Then they spend the majority of their time discrediting the theory of evolution, concluding that since evolution is wrong, creationism must be right.

In scientific revolutions and paradigm shifts, however, it is not enough to just discredit a theory. You must also replace it with one that explains both the "normal" data and the "anomalous" data not explained by the old theory. In other words, it must be a superior model, which requires that you present evidence in favour of it, not just against the opposition. The problem with *either-or* thinking was expressed with levity by an unknown poet:

In matters controversial,
My perception's rather fine.
I always see both points of view,
The one that's wrong, and mine.

Circular Reasoning

Also known as the *fallacy of redundancy, begging the ques-*

US CSICOP Skeptics Library

CSICOP has been trying to have available, both to its staff and to anyone else who wishes to use it, the finest library of skeptical materials on the paranormal in the world. We have been gathering material for this collection as a part of the Center for Inquiry's library, under the direction of Dr. Gordon Stein. He has been combing the used bookstores of the country for appropriate material.

We would also like to appeal to you. We need your generous help in filling the runs of journals and books that we have been unable to find. Anything (either pro or con, including paperbacks, but no science fiction or other types of fiction) would be welcomed as a donation. We would be glad to give you a valuation for income tax purposes. CSICOP is a 501 (C)-3 charitable organisation.

If you have material that you would like to donate, please write Dr. Stein at the Center for Inquiry, 3965 Rensch Road, Amherst, NY 14228, briefly describing what you would like to donate. Thanks for your help.

Tom Genoni, CSICOP

tion, or *tautology*, this is when the conclusion or claim is merely a restatement of one of the premises. Christian apologetics (theological defences) are filled with tautologies: Is there a God? Yes. How do you know? Because the Bible says so. How do you know the Bible is correct? Because it was inspired by God — i.e., God is because God is.

Science also has its share of redundancies: What is gravity? The tendency for objects to be attracted to one another. Why are objects attracted to one another? Gravity. In other words, gravity is because gravity is. The problem is in definitions, which are difficult to make without being tautological in your thinking: Why does Mother Theresa do such good work for others? Because she is moral. What does it mean to be moral? It is doing good works for others. Difficult as it is, we must try to construct operational definitions that can be tested, falsified, and refuted.

Reductio ad Absurdum and the Slippery Slope

Reductio ad absurdum is the refutation of an argument by reducing it to an absurd conclusion if carried out to its logical end. If the consequences are absurd, then the statement must be false. This is not necessarily so, though sometimes this is a useful exercise in critical thinking because often this is a way to discover if a claim has validity, especially if the experiment (the actual reduction) can be run to find out.

Similarly with the *slippery slope* fallacy, where one thing leads ultimately to another so extreme that the first step should never be taken. For example: Eating Ben & Jerry's ice cream will cause you to put on weight. Putting on weight will make you overweight. Soon you will weigh 350 pounds and die of heart disease. Eating Ben & Jerry's ice cream leads to death. Don't even try it. Certainly eating Ben & Jerry's ice cream may lead to obesity, and could possibly, in very rare cases, cause someone to balloon up to 350 pounds. But this is quite unlikely. The consequence does not necessarily follow from the premise.

Psychological Problems in Thinking

Effort Inadequacies and the Need for Certainty, Control, and Simplicity

Most of us, most of the time, have a desire for certainty, a need to control our environment, and a preference for simplicity. This, no doubt, stems from our evolutionary background in the quest to better understand and change the environment for the purpose of survival. (Those who were most successful in understanding and controlling their environment left behind the most offspring, who in turn were more successful than their ancestors, and thus left behind the most offspring, and so on to us.) Thus, the need for certainty, control, and simplicity, and the desire to expend the least effort for the greatest return, is probably biologically wired and good for the species. But good for the species is not always good for the individual. In a multifarious society with complex problems, these characteristics can interfere with critical thinking and problem solving.

Scientific and critical thinking does not come naturally. It takes training, experience, and effort, as Alfred Mander explained in his *Logic for the Millions* (1947, p. vii):

Thinking is skilled work. It is not true that we are naturally endowed with the ability to think clearly and logically - without learning how, or without practising. Peo-

ple with untrained minds should no more expect to think clearly and logically than people who have never learned and never practised can expect to find themselves good carpenters, golfers, bridge players, or pianists.

We must always work to suppress the need to be absolutely certain, in total control, and always to seek the simple and effortless solution to problems. The solutions, of course, may be simple and easy to derive, but this is not usually the case. We are well advised to keep this component of our psyche in abeyance.

Over-reliance on Authorities

Similar to the *genetic fallacy* (but broader in scope), we tend to rely heavily on authorities in our culture, especially if they are considered to be highly intelligent. The IQ score has taken on nearly mystical proportions of power in the last half century, but as James Randi notes: "Possession of a 'high IQ' often has little to do with one's ability to function as a rational human being."

As an example, Randi notes that belief in the paranormal is not uncommon among Mensa members, representing the top two percent of the population, with some arguing that their "Psi-Q" is also superior. The problem, says biochemist and *Skeptic* editorial board member Elie Shneour, "is the low estate in our society of individuals able or willing to think for themselves. At almost any time there are pervasive, almost all-encompassing, pressures to direct what we are to think."

Randi is also fond of lampooning authorities in the form of PhDs who, he says, once they are granted the degree find it almost impossible to say two things: "I don't know" and "I was wrong." Authorities, by virtue of their expertise in a field, may have a greater probability of being right in that field, but it is certainly not guaranteed, and their expertise does not necessarily qualify them to jump to conclusions in other areas.

Problem-Solving Inadequacies

All critical and scientific thinking is, in a fashion, problem-solving. There are numerous psychological disruptions that cause problem-solving inadequacies. Psychologist Barry Singer has demonstrated that when people are given the task of selecting the right answer to a problem by being told whether particular guesses are right or wrong, they do the following (1981, p. 18):

- Immediately form a hypothesis and look only for examples to confirm it;
- Do not seek evidence to disprove the hypothesis;
- Are very slow to change the hypothesis even when it is obviously wrong;
- If the information is too complex, adopt overly-simple hypotheses or strategies for solutions;
- If there is no solution, if the problem is a trick and "right" and "wrong" is given at random, form hypotheses about coincidental relationships they observed. Causality is always found.

If this is the case with humans in general, then we all must be vigilant in our efforts to overcome these inadequacies in solving the problems of science and of life.

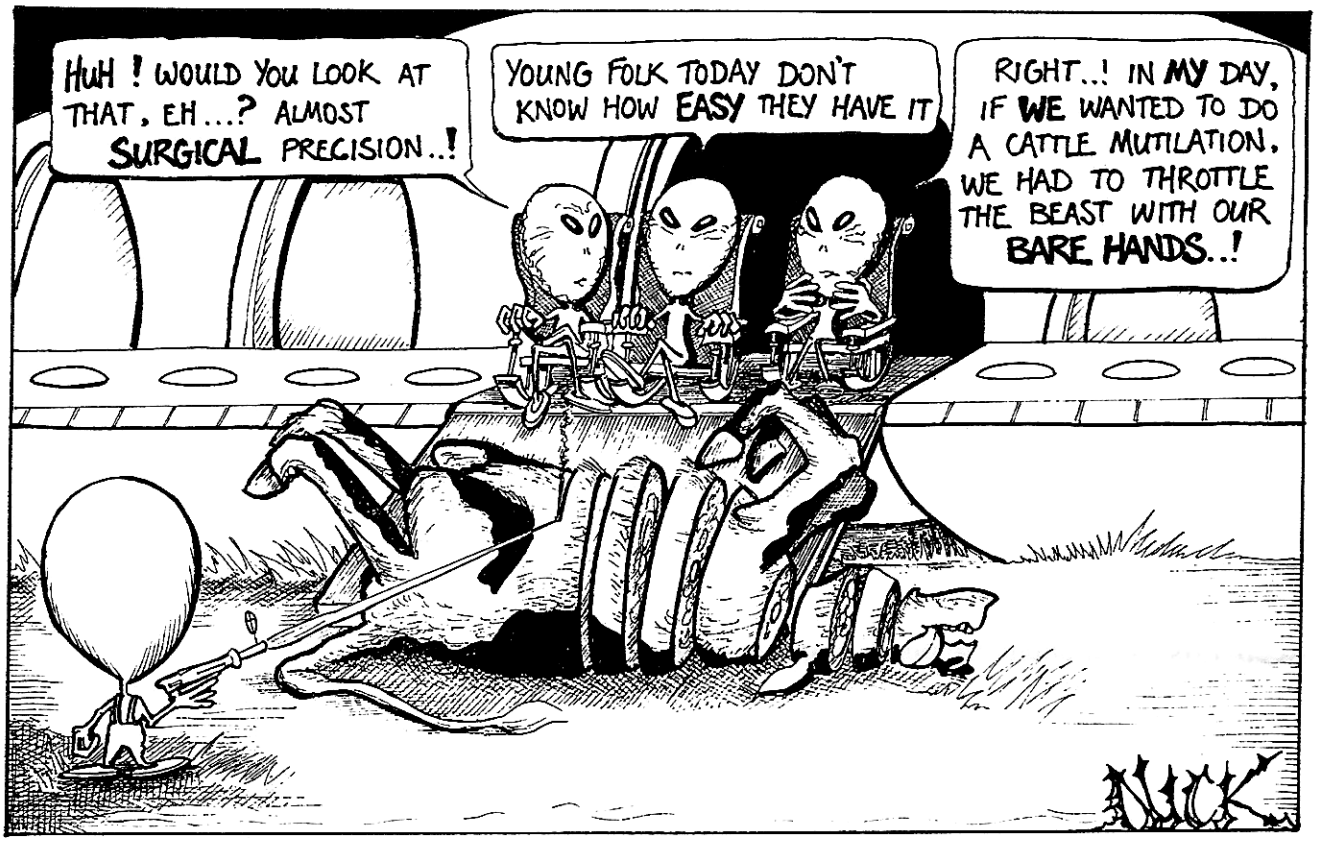
Ideological Immunity, or The Planck Problem

In his now classic book, *The Structure of Scientific Revolutions* (1962), Thomas Kuhn described the essence of revolutions as "paradigm shifts". When enough members of the scientific community (particularly those in positions of scientific hegemony) are willing to abandon the old orthodoxy in favour of the (formerly) radical new theory, then, and only then, can the paradigm shift occur. This generalisation about change in science is usually made about the paradigm as a system, but we must recognise, of course, that the paradigm is a mental model in the minds of individuals.

We can thus consider the problem of the resistance to change to be a psychological as well as a sociological one. My friend Jay Stuart Snelson has identified this obstinacy to change in individuals as an ideological immune system, where "educated, intelligent, and successful adults rarely change their most fundamental presuppositions" (1993, p. 54). According to Snelson, the more knowledge individuals have accumulated, and the more well-founded their theories have become, the greater the confidence in their ideologies. The consequence of this, however, is that they build up an "immunity" against new ideas that do not corroborate previous ones.

Historians of science call this the *Planck Problem*, after Max Planck, who made this observation of what must happen for innovative progress to occur in science (p. 97):

An important scientific innovation rarely makes its way by gradually winning over and converting its opponents: it rarely happens that Saul becomes Paul. What does happen is that its opponents gradually die out and



ALIEN OLD-TIMERS

that the growing generation is familiarised with the idea from the beginning.

Psychologist David Perkins conducted an interesting correlational study in which he found a high positive correlation between intelligence (measured on a standard IQ test) and the ability to give reasons for taking a point of view and defending that position; he also found a high negative correlation between intelligence and the ability to consider other alternatives. That is, the more intelligent the individual, the greater the potential for ideological immunity.

On one level, however, ideological immunity is purposefully built into the scientific enterprise as a way of maintaining the status quo long enough to test the validity of various claims. Historian of science I.B. Cohen explains:

New and revolutionary systems of science tend to be resisted rather than welcomed with open arms, because every successful scientist has a vested intellectual, social, and even financial interest in maintaining the status quo. If every revolutionary new idea were welcomed with open arms, utter chaos would be the result" (1985, p. 35).

In the end, history rewards those who are "right" (at least provisionally). Change does occur. In astronomy, the Ptolemaic geocentric universe was slowly displaced by Copernicus's heliocentric system. In geology, Cuvier's catastrophism was gradually edged out by the more soundly supported uniformitarianism of Hutton and Lyell. In biology, Darwin's evolution superseded the creationist's belief in the immutability of species. In Earth history, Alfred Wegener's idea of continental drift took nearly half a century to find acceptance in opposition to the received dogma of fixed and stable continents. Because science is progressive, however, such immunity is eventually overcome.

Transcendental Temptation

There is one final psychological component to consider in the disruption of critical thinking, and that is what the philosopher Paul Kurtz calls the *transcendental temptation*, discussed at length in his book of this title (1986). In essence, it affects all human beings who have thoughtfully considered the ultimate end of our being - death and the possibility of life after death. The temptation, says Kurtz, touches every soul for the simple reason that none of us is thrilled by the prospect of a finality to life:

The transcendental temptation lurks deep within the human breast. It is ever-present, tempting humans by the lure of transcendental realities, subverting the power of

their critical intelligence, enabling them to accept unproven and unfounded myth systems" (p. 477).

Specifically, Kurtz argues, myths, religions, pseudosciences, and claims of the paranormal are lures tempting us beyond rational, critical, and scientific thinking, for the very reason that they touch something in all of us that is so sacred and important - life and immortality:

It is apparent that the quest for transcendence expresses a passionate desire within the human breast for immortality and permanence. This impulse is so strong that it has inspired the great religions and paranormal movements of the past and the present and goaded otherwise sensible men and women to swallow patently false myths and to repeat them constantly as articles of faith" (p. 417).

One would be hard pressed, of course, to find a gene or trait for "transcendental temptation", so we must consider what is behind the construction of these beliefs that are so appealing to our emotions and desires. Kurtz claims it is the "creative imagination" that is the driving force behind the transcendental temptation (p. 459):

There is a constant battle in the human heart between our fictionalised images and the actual truth. We fabricate ideal poetic, artistic, and religious visions of what might have been in the past or could be in the future. But whether these idealised worlds are true is another matter. There is a constant tension between the scientist and the poet, the philosopher and the artist, the practical man and the visionary. The scientist, philosopher, and practical man wish to interpret the universe and understand it for what it really is; the others are inspired by what it might become. Scientists wish to test their hypothetical constructs; dreamers live by them. All too often what people crave is faith and conviction, not tested knowledge. Belief far outstrips truth as it soars on the wings of imagination.

This is the price we pay for being humans and not automata.

Spinoza's Dictum

In considering how thinking goes wrong, especially in the context of conducting skeptical investigations of pseudoscience and paranormal claims, we might ask ourselves, do we enjoy the process because it "debunks" what we believe to be nonsense? In part, I confess, there is some pleasure in seeing someone else's bizarre claim harpooned. This pleasure, I suspect, is normal and can be found in most members of most groups when confronting others who think differently. But as rational skeptics and critical thinkers we must move beyond our emotional responses and realise that through understanding how others have gone wrong, and how all science is subject to social control and cultural influences, we can improve our understanding of how the world works. It is for this reason that it is so important for us to understand the history of both science and pseudoscience, so we understand the larger picture of how these movements evolve. This is why the Skeptics Society has adopted as its motto the belief of the 17th-century Dutch philosopher Baruch Spinoza:

I have made a ceaseless effort not to ridicule, not to bewail, not to scorn human actions, but to understand them.

Skeptic magazine editor Michael Shermer is Director of the Skeptics Society (US) and adjunct assistant professor in the history of science at Occidental College (US). *Skeptic* can be contacted at 2761 N. Marengo Ave, Altadena, CA 91001, USA; email skepticmag@aol.com

Richard Dawkins visit

Zoologist Dawkins is the author of popular books such as *The Selfish Gene* and *The Blind Watchmaker*. He will be visiting New Zealand during the week of September 9, and will deliver lectures in the four main centres.

Details available so far are:

Date	City	Place/Topic
Sep 9	Christchurch	University of Canterbury Climbing Mount Improbable
Sep 13	Dunedin	University of Otago, Castle 2, 5pm Climbing Mount Improbable
Sep 14	Wellington	Victoria University Science as Religious Education
Sep 16	Auckland	University of Auckland Climbing Mount Improbable

Plans for health science college

by Naomi Gilling

A Christchurch general practitioner, David Lovell-Smith, wants to set up a college in New Zealand for the practice of a 4000-year-old Indian health science.

Dr Lovell-Smith, who has recently returned from a visit to a Maharishi Vedic College in Melbourne, where he was tutoring, said a college might be set up in Christchurch, depending on interest. The aim would be to teach all that was best in Western medicine and adding Vedic knowledge. At present he and another doctor, Jenny Spring, were the only two doctors practising the therapy in Christchurch. However, New Zealand Physicians for Maharishi Medical Colleges had been formed with 31 members.

Western medicine did well in treating acute illness, but was not so effective with chronic and relapsing disease, he said.

More than 500 studies on the Vedic approach to medicine showed it lowered blood pressure and anxiety levels. The therapy included use of meditation, changes in diet, massage, and herbs.

Vedic medicine helped such common problems as migraine, hypertension, and indigestion.

E. POST 25-4-96

Bureaucrats UK's answer to X-Files

LONDON, April 24. – Scully and Mulder they ain't, but British defence chiefs have revealed they, too, have their very own X-Files team.

Locked away in a secret room, no doubt somewhere in the depths of Whitehall, is a hitherto unknown pair of bureaucrats who go by the title of Secretariat (Air Staff) 2A MOD.

Their mission is to document and file the hundreds of sightings of unidentified flying objects and other paranormal phenomena sent in every year. In short, to boldly go where no public servants have gone before.

Their jobs may be similar, but Secretariat 2A is nowhere near the glamour and excitement of the FBI team on the TV series X-Files.

Instead of travelling the country in designer clothes searching for aliens, vampires and other assorted oddities, the team sits in its office quietly filing the up to 300 reports a year they receive of what Ministry of Defence calls "u plained sightings".

"We do not have a special d investigating UFOs," a Ministr Defence spokesman said.

"This is nothing to do with l green men.

"If people write to us, as the every day with sightings of sc thing of what they believe is un al, then someone has to look int and reply.

"This is the work of the sec arial team.

"Yes, many of the reports about UFOs and other odd si ings, but we are definitely not vestigating them."

The team's existence was vealed in the latest issue of F News.

RAF News was dismissive of existence of UFOs, saying th was "no evidence which might stantiate the existence of such p nomena". – NZPA

MIRACLES

Suspending laws of nature

By ANGELA OTS

MIRACLES don't happen – do they? Even religious leaders believe there is a rational explanation for them.

The morning Rita Klaus, then 46, was spontaneously healed of the worst kind of multiple sclerosis, she was listening to a theologian address a summer school scripture course.

When Jesus walked on water, he was really walking on a sandbar, the theologian said. When he was supposed to have multiplied the loaves and fishes he was actually asking the people there to share what they had. He had known there were medicinal properties in the mud he smeared on a blind man's eyes that would cure him. Science would one day find that enzyme.

Klaus didn't hear any of this. Others present told her later. She was too busy that June morning in 1986 dealing with the extraordinary sensations sweeping through her partially paralysed body.

First the rush of fiery heat. She thought, "Is this what happens next? Muscle spasms? I'm already in a wheelchair – this is all I need."

As the heat gave way to intense itching, Klaus began to scratch – then realised she could feel her fingers. She could feel the braces on her legs. Her toes, numb for years, were wiggling inside her orthopaedic shoes.

At a recent Catholic convention in Lower Hutt, Klaus told her story again. In the 10 years since her recovery the former science teacher has done little else, travelling the world. Although she misses her family, she is convinced God cured her to be a sign to the world it is in danger of losing the heritage of Jesus Christ.

As Klaus tells it, her real healing came five years before the event, at a healing church service in her Pennsylvania town.

Klaus had been a religious little girl. At 10 she claims she saw the holy family as she was drowning at the bottom of the local swimming pool. At 15 she entered a convent and by 17 had taken her vows as a nun. It was a year later that she went temporarily blind in the shower one day, and not long after that showed the first signs of MS.

Her condition worsened and she decided to leave the rigorous convent life doctors said would kill her. Remission followed, only for the disease to reappear 19 years after the first episode, when she was married with three young children. She rapidly deteriorated until she was in braces up to her hips, reduced to a wheelchair and crutches.

She was urged against her will to go to a healing service. Cynical and trying her best to look inconspicuous, her rage and humiliation were boundless when a group of priests prayed over her and laid hands on her. It was then, she says, she finally found peace.

Doctors had told her there would be no remission and her physical condition kept deteriorating until by 1986, she was in a wheelchair fulltime.

She had read about the visions of the Virgin Mary supposedly appearing in Medjugorje, former Yugoslavia. "I was so taken I began to do what Our Lady asked, to pray and fast, and accept the inconveniences of my disease and suffering.

"I was lying in bed one night and heard a voice. I was scared because there was nobody there. Then I knew it was Our Lady because the voice was so sweet. She said 'why don't you ask'. I said 'what am I supposed to ask for?' and I was given this prayer."

The prayer asked Mary to ask Jesus to heal Klaus. "Instantly I felt this wonderful feeling like champagne bubbling through me, but I fell into a deep sleep."

The next day she woke still paralysed and with no recollection of the night before. Then followed the burning and itching as she sat in her wheelchair at summer school, the realisation once she was home that she no longer needed her crutches, that her badly deformed right leg was straight again.

Afterwards she says, a team of specialists could not believe what they saw when they compared her state with x-rays showing her former bone displacement caused by muscle and ligament wastage

FRIENDS IN FAI
has studied the l

Ruling delays NZ's Hoxsey clinic

by Kevin Taylor

The establishment of a New Zealand Hoxsey cancer clinic has been delayed by a Medical Council decision, but supporters are still hopeful it will go ahead.

The council has refused to register Joanna Wolstenholme-Stehbauer, who was going to work at the clinic.

She was refused registration because she did not have a qualification listed in the Medical Practitioners Act and she had not done a New Zealand Registration Examination.

Hoxsey Support Group member and editor of the group's newsletter, Gwen Scott, of Christchurch, said yesterday that Dr Wolstenholme-Stehbauer was registered in Australia, was an Australian citizen, and had a medical degree from Austria.

No definite site for the clinic had been decided, but Christchurch was one of the contenders.

Gwen Scott has started a petition calling for the Medical Licensing Board to grant Dr Wolstenholme-Stehbauer a licence so it can go ahead. She said the group was "very positive" the issue would be resolved. The refusal was unjustified, but she believed the council did not fully understand the situation.

"I think that they are acting within their laws, but we are the people. We have the right to alter those rules. There's always common sense, and logic has to come into it as well."

The council said medical registration in Australia did not automatically entitle overseas-trained doctors to work in New Zealand.

The clinic, offering non-conventional and conventional cancer treatment, would use the methods of the famous Hoxsey Bio-Medical Centre in Mexico.

Hoxsey Support Group founding member Janice-Ann Priest said Dr Wolstenholme-Stehbauer's application was declined "without even an interview. I mean, the arrogance of it. Everything in this day and age is negotiable."

She said the application was made under special dispensation for specialised treatment, which allows doctors who are specialised in a form of treatment in demand to get approval.

More than 700 New Zealanders in 18 months had gone to Mexico for treatment. "There's so many people going over (to Mexico), we've been able to make a special deal with Air New Zealand direct."

■ Playground of the gods

A highflyer goes bust in the great intergalactic sharemarket crash of 1,987,000BC: his holiday home project at Kaimanawa on planet Earth is mothballed, sadly leaving only the first two stages complete – the spa pool on Ruapehu and the petanque pitch at Moeraki.

Listener 8 Jun 96 **Peter Lange**
(Mt Eden, Auckland)

– Rita Klaus, left, and Jan Connell, who djugorje visions.

"Many doctors in the States have done all ds of tests on me, physical and psychologic- and can't find any scientific reason for what ppened to me.

"Many have become converted. I taught sci- e for years, but I know that the laws of ure can be suspended." □

Tribe puts ban on tampering with wall

NZPA; Press 15/04/96

WELLINGTON — A Turangi-based tribe said last night that it had put a rahui, or ban, on people tampering with the Kaimanawa stone wall, east of Taupo, because the area was a sacred site.

A statement from the Tuwharetoa Maori Trust Board said the ban would stay until they were satisfied the Government had done enough to protect the formation.

The board said recent "outpourings of unlearned ramblings" about the wall had caused unhealthy attitudes among the public.

"Those attitudes are now generating the damage now occurring at the Kaimanawa site," the statement said.

"People should respect what is exclusively a private matter."

Yesterday the Conservation Department attempted to stop debate about the mysterious wall by declaring it a natural rock formation.

The department said the wall was not a man-made pyramid pre-dating the arrival of the Maori. It was a natural formation made of the volcanic rock ignimbrite and there would be no excavation.

DOC has consulted an ignimbrite specialist and a DOC officer expert in both ancient structures and rock formations.

Taupo regional conservator Paul Green said: "I hope we can put it to bed now."

Hamilton archaeologist Barry Brailsford said he still believed humans had some hand in the wall.

He sparked international speculation over the wall's origins 10 weeks ago when he said it was man-made. The site was significant in Maori culture and humans had played a part in its existence, he said.

Sham treatment can be helpful

CHIROPRACTOR'S NOTES

by Stuart Craig, a Christchurch chiropractor

In the 1950s a popular type of surgery was performed on people who suffered from angina. A blood vessel — the internal mammary artery — was tied to divert blood flow towards the heart, and it was felt this type of surgery had good results.

However, experimental evidence later showed that the theory was untrue. In a trial between two groups of patients — one having the artery tied and the other having an incision only (a sham operation) — it was found that those getting the sham surgery responded just as well. The benefits of the surgery were produced by a placebo effect.

Placebo interventions used in scientific trials include, for example, a pill with no medication in it and electrotherapy (such as ultrasound or laser) with the power turned off.

Electrical machines have had great appeal for patients, and studies of patients with soft tissue injuries and tibial fracture show that patients do just as well with the electricity turned off.

It might be fair to say that placebo effects were probably the only effective basis of treatment for thousands of years, and today remain one of the most important elements of health care.

In chiropractic, essentially a manual therapy, there will always be a strong placebo effect. Manual contact with the patient, in examination and treatment, is generally regarded as having a stronger placebo effect than medication, machines, or surgery.

In addition, the actual adjustment or manipulation typically produces a "pop" sound, which to most patients is evidence of a successful and valuable treatment. It makes them feel that something which was "out" is now "in".

In reality, it is not the sound which achieves the results but the movement of the vertebral joint that causes relief.

The placebo effect should not be a substitute for effective treatment, but it is worth recognising that it is at least as important in influencing a patient's recovery as is the real treatment itself.

Sokal's Suckers

A physicist with hidden motives writes something unexpected for a "cultural studies" journal. Was it a churlish hoax or a valuable exposure of nonsense?

The Nando Times Voices *recently published the following article:*

Physicist Alan Sokal of New York University meticulously observed all the rules of the academic game when he constructed his article on postmodern physics and submitted it to a prestigious journal of cultural studies called *Social Text.*

The people he cites as authorities are the superluminaries of the field, the quotations he uses to illustrate his argument are strictly accurate and the text is bristling with footnotes.

All the rules but one, that is: Sokal's article is a parody. Under the grandiloquent title "Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity," it appeared in the Spring/Summer 1996 special issue of the magazine, one entirely devoted to "the science wars", as the editors term the tension between people who actually do science and the critics who merely theorise about it.

Many scientists believe that the emperors of cultural studies have no clothes. But Sokal captured the whole royal court parading around in naked ignorance and persuaded the palace chroniclers to publish the portrait as a centrefold.

Once the article was safely in print, Sokal revealed his modest experiment. "Would a leading journal of cultural studies," he wrote in the May/June issue of *Lingua Franca*, "publish an article liberally salted with nonsense if (a) it sounded good and (b) it flattered the editors' ideological preconceptions?"

Unfortunately yes, and Sokal's deliberate nonsense is anything but subtle. Translated into plain English from the high-flown language he borrowed for the occasion, his first paragraph says that scientists "cling to the dogma" that the external world exists and its properties are independent of what human beings think.

But nobody believes that old stuff any more, right? Now we all know that physical reality is "at bottom a social and linguistic construct."

Is there a sound when a tree falls in the forest and no one hears it? Under the theory of social construction, there's not even a tree.

There are so many red flags planted throughout the paper that even non-scientists should have spotted at least one and started laughing," Sokal said Thursday. "Either this is a parody or the author is off his rocker."

Sokal was prompted into parody by a 1994 book, *Higher Superstition: The Academic Left and Its Quarrels with Science*, by Paul Gross and Norman Levitt, which ruffled a lot of postmodernist feathers.

"I'm an academic leftist and I have no quarrel with science," Sokal said, "so the first thing I did was go to the library and check their references, to see whether (Gross and Levitt) were being fair", and they were. In fact, he found even more examples of scientific illiteracy, some of them even worse.

"It would be so boring to refute them," Sokal said. "I picked the silliest quotes from the most prominent people, and I made up an argument for how they were linked together."

Was Sokal's experiment ethical? "It's true the author doesn't believe his own arguments," he wrote in *Lingua Franca*. "But why should that matter? If the 'Social Text' editors find my arguments convincing, then why should they be disconcerted simply because I don't?"

They are disconcerted, of course, and for reasons that transcend their private embarrassment at being taken in. Sokal's successful spoof calls into question the intellectual standards of the whole field.

If you're chuckling, but inclined to think it's just professors doing their usual angels-on-a-pinhead thing, please do think again. Tuition and fees at the priciest private universities run nearly $1,000 for each week of class. Taxpayers pick up a big chunk of the bill for public universities. Many of those classes are being taught, it appears, by professors who deny the distinction between truth and falsity and consequently can't distinguish double-talk from rational argument.

Maybe some of the junior professors and the graduate students do know what they're hearing is nonsense, but think it

would be harmful to their careers to speak out. Living with such deception, possibly for a lifetime, is profoundly corrupting. Honest people just get out, leaving the field to those who don't mind deception or don't recognise it. It's hard to say which is worse.

But it's easy to see why Sokal's spoof was enticing to editors desperate for the imprimatur of a working scientist on their critical enterprise, and he even inserted the evidence by quoting Andrew Ross, who edited the special issue.

The kind of science that's needed, Ross said, is one "that will be publicly answerable and of some service to progressive interests."

So that's the kind of science Sokal claimed to be writing about.

"A liberatory science cannot be complete without a profound revision of the canon of mathematics," he concludes. "We can see hints of (such emancipatory mathematics) in the multidimensional and nonlinear logic of fuzzy systems theory but this approach is still heavily marked by its origins in the crisis of late-capitalist production relations." He drags in catastrophe theory and chaos theory, too.

There is a political point to Sokal's demonstration, but it's not the right-wing one he's sure will be attributed to him. He's proud to call himself a leftist, and his resume includes a stint teaching mathematics at the National University of Nicaragua under the Sandinistas.

"If you take up crazy philosophies you undermine your ability to tackle questions of public policy, like ecology," he said. "It really matters whether the world is warming up."

I don't remotely share Sokal's political views, but I agree with him that the corruption of clear thought and clear language is dangerous. And corruption has to be exposed before it can be cleaned up.

Linda Seebach is the editorial page editor of the Valley Times (Pleasanton) and San Ramon Valley Times (Danville).

True Believers

Some police are still guilty of scepticism, but retraining is on its way

Dr Felicity Goodyear-Smith

At the recent DSAC conference on rape (DSAC Inter-disciplinary Conference: "Rape: 10 years' progress?", Wellington 27-30 March), it was continually emphasised how important it is for police and other professionals to believe a rape complainant. Indeed, the main criticism of the police was when they approached a case sceptically and focused on looking at gaps in the evidence rather than supporting the victim. It was acknowledged that some police personnel continued to treat complainants with scepticism and looked for evidence to corroborate an allegation, but senior police officials reassured the conference audience that police are to be trained to support complainants and not challenge their stories in any way.

This attitude was again reinforced on the Fraser "debate" on Rape (TV1. 15 April 1996), when visiting British Queen's Counsel Helena Kennedy was critical of investigators treating a rape complainant with any degree of scepticism.

Despite what I believe is mounting evidence to the contrary, sexual abuse workers in many disciplines, including police, DSAC doctors, social workers, psychologists and therapists, are instructed that it is extremely unlikely for a sexual allegation to be false. It is now accepted police policy to treat every sexual allegation as genuine, and to minimise the distress of the complainant by avoiding critical examination of her testimony.

I contend that rape allegations should always be taken seriously. All complainants should be treated with sensitivity, compassion and respect. All those accused should be treated in the same manner. The police should be sceptical: they should neither believe nor disbelieve the complainant, but ask "What is the evidence?" and conduct an impartial investigation.

Men and women have equal capacity for both good and evil. Some men do rape, but some women also cry rape when it has not happened.

Felicity Goodyear-Smith (MB, ChB, DipObst, MRNZCGP) is a GP who has specialised in the field of sexual abuse. She is the founder of the organisation COSA, Casualties of Sexual Allegations.

Reviews

DARK NATURE — A NATURAL HISTORY OF EVIL, by Lyall Watson; Hodder & Stoughton, 1995; $19.95

The book has been divided into three parts, Dark Nature, Human Nature and Evil Nature, and is extremely easy for any lay entity to read. It's also gratifying that Lyall seems to be back on track after his divergence into the "other world".

Lyall Watson's reason for investigating evil was its constant presence throughout time and the world. For anything to have existed for so long there has to be an evolutionary part for it to play, but what?

The book takes the reader on a personal ancestral journey from the beginnings of life up to the present day looking at the power of the genes. It is Lyall's theory that the gene is the reason we exist at all and is the probable cause of the evil **present in us all**. Robert Louis Stephenson was right on target with his Jekyll and Hyde. Aleksandr Solzhenitsyn says "If only there were evil people somewhere, insidiously committing evil deeds, and it were necessary only to separate them from the rest of us and destroy them. But the line dividing good and evil cuts through the heart of every human being. And who is willing to destroy a piece of his heart?" — *The Gulag Archipelago.*

Regardless of whether you subscribe to his theory when you finish reading there is no doubt that it's thought provoking. Genetically speaking, it's the best non-fiction I've read since *Genetic Prophecy.*

Heather Mackay, Auckland

RIVER OUT OF EDEN: A DARWINIAN VIEW OF LIFE by Richard Dawkins. Weldenfeld & Nicalson, 172pp, $29.95.

We start by setting this book into its two contexts. In the publishing context it is the fourth in the "Science Masters" series; authors of its predecessors are two cosmologists (J. D. Barrow and Paul Davies) and an anthropologist (Richard Leakey), and successors are promised from an equally glittering list of science writers.

In the "Dawkins context" this book continues the argument started in *The Selfish Gene* and *The Blind Watchmaker.* Readers familiar with these will find the same highly readable style, vivid prose and vigorous argument.

The title is from the Book of Genesis: "And a river went out of Eden to water the garden". That one of the most scornful critics of those who believe in the literal truth of the Biblical creation myth uses this source should raise a smile for its cheekiness.

The extraordinary variety of life today results from the appearance on Earth more than 3000 million years ago of self-replicating chemical units. The flow through time of these units and their successors, the genes we know today, making use of mortal bodies on the way, Dawkins likens to the flow of water down an ever-broadening and dividing river. He makes much of the fact that this is a flow of information, and like the information in the better quality electronic communications, it is digitised.

A chapter is given to "African Eve", possible ancestor in the female line to all us humans today, and, the author claims, a much more interesting person than her Biblical namesake. Other chapters are on gradualism (evolution of eyes and other marvellous mechanisms) and on "God's Utility Function", in which the "problems" of evil and suffering are brusquely dismissed.

In his final chapter, Dawkins speculates on the universal aspects of evolution — what are the essential elements of the process, wherever it may occur? He defines several thresholds which must be crossed as the complexity of replicating systems increases. We have recently crossed the ninth, or Radio Threshold, where the escape of radio signals from Earth could alert distant observers, for the first time, to the occurrence of life here. We are on the verge of his 10th and final threshold, that of space travel.

T.H. Huxley, the 19th-century champion of evolution by natural selection, was nicknamed "Darwin's Bulldog". Recently the "Scientific American" referred to E. Mayr, the eminent nonagenarian biologist, as "Darwin's Current Bulldog". In the kennels of evolutionary theory, we may regard Dawkins as "Darwin's Rottweiler", for his aggressive defence of, and wide claims for, natural selection.

A footnote: has Dawkins been taken over by his American spell-checker? Despite the book's English origins, any words with alternative spellings are in American English.

Bernard Howard, Christchurch

Mysterious Origins Demystified

The Mysterious Origins of Man showed earlier this year on TV3 as a "documentary". It is likely to be a contender for this year's Bent Spoon Award.
The following article is excerpted from a piece by Dave Thomas that ran in the March issue of Skeptical Briefs *in response to the initial US airing of the show.*

Quality science was nowhere to be found during the Feb. 25th, 1996 NBC broadcast entitled *The Mysterious Origins of Man*. This show, hosted by Charlton Heston, was filled with some of the most aggressive anti-science propaganda seen since CBS's *Ancient Mysteries of the Bible* was aired a few years ago. The executive producers of *Origins* for B.C. Video were Michael H. Gerber and Robert Watts. It was directed by Bill Cote, produced by John Cheshire, Bill Cote, and Carol Cote, and written by John Cheshire and Bill Cote.

The show did not include comments from even one token "reputable scientist". Instead, Heston would state the conventional wisdom, and then let the "scientists" interviewed for the show present their fantastic claims unchallenged.

The first such "experts" who testified were Michael Cremo and Dr. Richard Thompson, authors of *Forbidden Archaeology*. They claimed that "Humans of modern anatomical type have been existing for many many millions of years into the past", denying the current consensus that modern man appeared less than a tenth of a million years ago.

"Anomalous" cases, such as the alleged 55-million-year-old tools found in Table Mountain in the 1880s by J.D. Whitney, or the supposed 250,000-year-old artifacts found by Virginia Steen-McIntyre in Mexico a couple of decades ago, were discussed. Thompson then declared that the resistance of mainstream science to these findings is not a "deliberate conspiracy," but an "automatic rejection" by almost all scientists of any evidence that doesn't conform to existing theories. He stated that this routine "hiding" of anomalous results prevents science from progressing.

If the assertion that scientists ignore all unusual or contrary data is true, then indeed, science would not progress. My question is: if this is the case, how can Thompson explain the fact that science has progressed, especially in the last century? Many new ideas have come along to upset existing paradigms — relativity, quantum mechanics, continental drift, and punctuated equilibrium, to name a few. Thompson's argument that scientists have ingrained antipathy to new or controversial ideas is clearly specious. Ingrained antipathy to new or controversial ideas is clearly specious.

Fossil Footprints and Fingers

The next segment featured Carl Baugh, who talked about the supposed human footprints found alongside dinosaur tracks at the Paluxy River near Glen Rose, Texas. The voice-over introduced him as "archaeologist Carl Baugh", but the on-screen title referred to him as "anthropologist Carl Baugh". In real life, however, Baugh is best known as Reverend Carl Baugh. Baugh claimed some of the Paluxy trackways include "16-inch human footprints, 12 in a series, alternating left-right-left-right, the right distance apart..." No mention was made of the painstaking research performed by Glen Kuban, Ronnie Hastings, Laurie Godfrey and others a decade ago, which showed conclusively that these trackways are made by dinosaurs.

When mud fills in the toes of a fresh tridactyl dinosaur print, the resultant track can look similar to a human's. Some of the alleged "human" prints belong in the same left-right series as obvious dinosaur tracks. Kuban and associates also found colour indications of dinosaur toes in tracks which were supposedly human.

At least these tracks are not obvious fakes, unlike Baugh's next bit of supposedly "most compelling evidence" which was discussed — the Burdick Print. This and similar prints first appeared in the 1930s. They are clearly suspect — the features (toes, heel, etc.) are abnormally shaped, and much too well delineated.

The Burdick print looks nothing like a real imprint of a foot in the mud, and bears little resemblance to human anatomy (even for a supposed "giant"). However, "expert" Dr. Dale Peterson, M.D. assured the audience that the print was "clearly human." Geologist Don Patton pointed to subsurface contours

in a cross-section through the print as evidence that the features were not carved.

Next up was a supposed "fossil finger," with smooth, skin-covered flesh "preserved intact," and with what resembles a fingernail. (While a very few fossilised patches of tough, scaly dinosaur skin have been found, preservation of soft human tissue would be extremely unlikely!)

When too much ice built up on the poles of that "era", the entire crust slid around, suddenly moving Atlantis/Antarctica to its present cold location.

Peterson pointed to images of finger bones and joints in a CAT scan of the "finger". However, the "bones" were not clearly distinct; rather, they simply looked like a progressive darkening of the scan in thicker portions of the specimen. Some grooved spherical nodules, from the pre-Cambrian (2.8 billion years old), were also touted as evidence of human artifacts.

Author David Hatcher Childress then claimed that geological time scales are wrong by several orders of magnitude, and that dinosaurs may still be alive today. He showed a photograph of a supposed "plesiosaur carcass" dredged up on a Japanese fishing boat; Heston condescendingly noted that "Skeptics claim it's the body of a decomposing shark." (It probably is.)

Heston's next target was Charles Darwin himself. Richard Milton, author of *Shattering the Myths of Darwinism*, stated that not one "missing link" supporting the common ancestry of man and apes has ever been found. Milton stated that "Lucy" is just an ape; he made no mention of the fact that Lucy's teeth are more human-like than ape-like in many respects. A cartoon of a tree, with Man on the top branches, and Apes below, was shown; as the animated branch broke, Heston declared "So far, conclusive evidence of a missing link has not been found." Milton went on to say that the lack of an ape-human missing link was sufficient to topple the entire edifice of evolution. No consideration was given to the tremendous amount of data that support evolution in non-primate species (fossils, comparative anatomy, molecular structures, etc.).

In the last half of the show, Neil Steede argued that the perfect fit of stones in Incan monuments indicated a high culture, and that the present-day "misalignment" of solstice markers can only be explained if the monuments were built over 12 thousand years ago.

Steede based this conjecture on a 41,000-year, half-degree wobble of the Earth's axis (which turns out to be a real phenomenon). While recent-era astronomical solstice locations are not aligned with the rounded markers Steede interpreted as the "real" markers, the solstice locations do appear to be aligned with the sides of the tower walls where they cross the horizon. The fact that Steed can conjure up an alignment consistent only with his 12,000 year age hardly proves that this is what the actual builders intended.

Graham Hancock, author of *Fingerprints of the Gods*, cited similarities in the megalithic cultures of Mexico, South America, and Egypt, and then claimed that these prove the common influence of a third, "unidentified" culture. Robert Banval employed more vague astronomical alignments to "prove" that the Sphinx was built 12,000 years ago.

Hancock continued with a discussion of "crustal displacement." Unlike continental drift, crustal displacement (developed by a Professor Hapgood) involves a radical motion of the Earth's entire outer crust. Hancock and others put forth the idea that 12,500 years ago, Antarctica was not at the South Pole, but in a moderate latitude, and that Atlantis was located there.

When too much ice built up on the poles of that "era", the entire crust slid around, suddenly moving Atlantis/Antarctica to its present cold location. No evidence supporting this fantastic claim was presented, and no one bothered to mention that readily available data clearly refute this hypothesis.

For example, most climatologists agree that the Antarctic ice shelf is a stable feature that has been around for 14 million years, and the Vostok ice core from Antarctica was carefully dated back to at least 150,000 years ago by a variety of independent methods. (This idea was refuted just a few minutes earlier in the same show, when we were told that 12,000 years ago, the Earth's axis was tilted by just one half of a degree, not the 90 degrees required for an "Antarctic Atlantis.")

Heston concluded the show by stating that "It's been said that man has made the climb from Stone Age to civilisation

more than once, and that our present time is just the latest in this cycle."old that 12,000 years ago, the Earth's axis was tilted by just one half of a degree, not the 90 degrees required for an "Antarctic Atlantis.") Heston concluded the show by stating that "It's been said that man has made the climb from Stone Age to civilisation more than once, and that our present time is just the latest in this cycle."

Ironically, scientists are not the only ones fuming over *Origins*. Arch-creationist Ken Ham slammed the production in the Feb. '96 *Answers in Genesis* newsletter. In a review entitled "Hollywood's 'Moses' Undermines Genesis", Ham attacked fellow creationist Carl Baugh's "manprints", stating that "According to leading creationist researchers, this evidence is open to much debate and needs much more intensive research. One wonders how much of the information in the program can really be trusted!" Then Ham noted that the book *Forbidden Archaeology* "...is dedicated to 'His Divine Grace A.C. Bhaktivedanta Swami Prabhupada.' It appears the authors are Hare Krishna adherents!...Everything cycling continuously over millions of years fits well with Krishna philosophy! That seems to be what this program is all about!"

Ken Ham is right to note that the teachings of Hare Krishna are not a basis of good science. It seems quite unlikely that he will ever realise that his peculiar brand of fundamentalist Biblical inerrancy is similarly flawed. In the meantime, NBC has sunk to a new low in this latest promotion of pseudoscientific claptrap.

If at First You Don't Succeed...

Edzard Ernst

Yes, it is frustrating, even positively nauseating. There you are struggling day in day out, doing your best and striving for the real breakthrough in science. Yet the real breakthrough never comes. Lack of talent, originality, or just not the right friends? Who knows? And who cares?

My advice is to call it a day — reconsider what you were hoping to achieve. You wanted a breakthrough in the field of your expertise, but think! How many are trying exactly that? It is hopeless. You ought to try something else. My advice is to try the fast and easy way — become a charlatan.

The advantages are obvious: if you do it right you have little competition, you'll be famous in no time at all and you definitely don't need to be a genius. Here is your comprehensive "charlatan survival kit".

First stop and think where (preferably but not necessarily in the area of your expertise) there might be a niche for you. The niche needs to be unoccupied and it ought to have a weird yet appealing touch. Being a medical man myself, I am prone to think of medical examples. Don't try to diagnose diseases by looking at people's eyes, tongues, ears or hands; too many fellow charlatans are already earning a good living on these "options". How about a new therapy? What about a cure based on consuming your dried, powdered toe nails in increasing and decreasing doses finely tuned with the moon cycle? Or what about creating a mysteriously dosed vacuum in the ear to clean out the "bad spirits" in your body's airways and soul — anything really, but make sure that only you can perform the act of your particular innovation. At the most you might condescend to educate a few followers (for good cash, self-evidently), but do not endanger your monopoly too much.

The next important step on the road to success is to give your method an identity. A suitable name can be easily found; you can use your own name if it has a mystical undertone to it, or use one that rings subconscious bells: "Livingstone's Life Line", "Hannibal's Handling", "Mac Master's Management". Better still, you create a pot-pourri of fashionable words, melting them together to give an utterly meaningless but highly impressive pseudoscientific term: "Entropic Enterospectrophy", "Bold Fusion", "Psychoanalytic Jogging", "Transcendental Recreation", "Crystal Radioaesthesiology" — use your imagination, it's unbeatable fun.

Your technique now requires a glamorous, mysterious background. Best link it up to some obscure ancient culture, Incas or Egyptians for instance. This implies "thousands of years of experience support you and your method" and "the wisdom of the forefathers must be respected". Historical roots are an essential asset, particularly for the slightly insecure charlatan.

Whatever your method/technique/invention/theory etc. does produce or achieve, it should be drastically out of line with the accepted thinking of the scientific establishment. Bowl them over by explaining that their so-called scientific approach is but naive reductionism and your ideas are based on a revolutionary change of paradigms. The

mere attempt to scientifically test your concepts within the framework of the old (former) and now obsolete paradigm, would destroy the innovation. If this fails, you must insist that your idea only works if one believes in it.

Next comes the only really difficult challenge in becoming a first rate charlatan: you must be convincing, more than convincing, you must be a monomaniac and charismatic. This usually needs some rehearsing. Go to rhetoric lessons, join a theatrical group, spy in a lunatic asylum, but do anything to become fanatically convincing and religiously missionary.

Now you are almost there. You only need a few tricks to complement your act but you will pick these up swiftly as you go along. With a base in science, you will find it easy to distort the scientific truth. Your former colleagues will, of course, challenge you in discussions, radio interviews, talk shows, etc. By all means attend those events — they are free PR for you. When the opposition comes with its boring facts, you counter with your imaginative distortions — the public won't be able to tell the difference and you will "win" because your concept offers more. It appeals to the need for irrationality, mysticism and unreason that is so deeply rooted in the human species.

When the going gets tough, you can always claim that you are being constantly and viciously attacked for reasons "well-known"; don't be too precise, hint at something "ethnic" or "extra-terrestrial" or "political" or waffle about strong lobbies that conspire against you — a consortium of pharmaceutical companies or the nuclear industry would be ideal. Elaborate on your altruistic dedication in spite of threats to your and your family's lives — you always wanted to be a hero anyway.

The rest should be clear sailing. "Successes" of your concept will now come fast and effortlessly. People will queue up to give evidence in favour of its usefulness. It would be good, though, if you had a few VIPs speaking out for you; take film stars, sports champions, pop singers. Beware of politicians! Not that they would manage to see through you, but they are not reliable enough and usually have their own monomania to follow.

My final word of advice will please your bank manager: be expensive, unscrupulously, even ridiculously expensive. People strongly believe that the more they pay, the more it's worth. And surely you are worth a lot.

Professor Edzard Ernst is Director of the Centre for Complementary Health Studies at the University of Exeter.

Skeptics' Conference

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Chanel Park Conference Centre, Hamilton
August 30 – September 1

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Name _____ Name _____

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_____ attendees @ $30 = $_____ registration fees

❑ **I/We wish to attend the conference dinner ($30)**

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