

Volume 7 Number 5
September/October 1993

The Skeptic



The Mysteries of Creativity

Also in this issue:

Collecting Anomalies of Nature

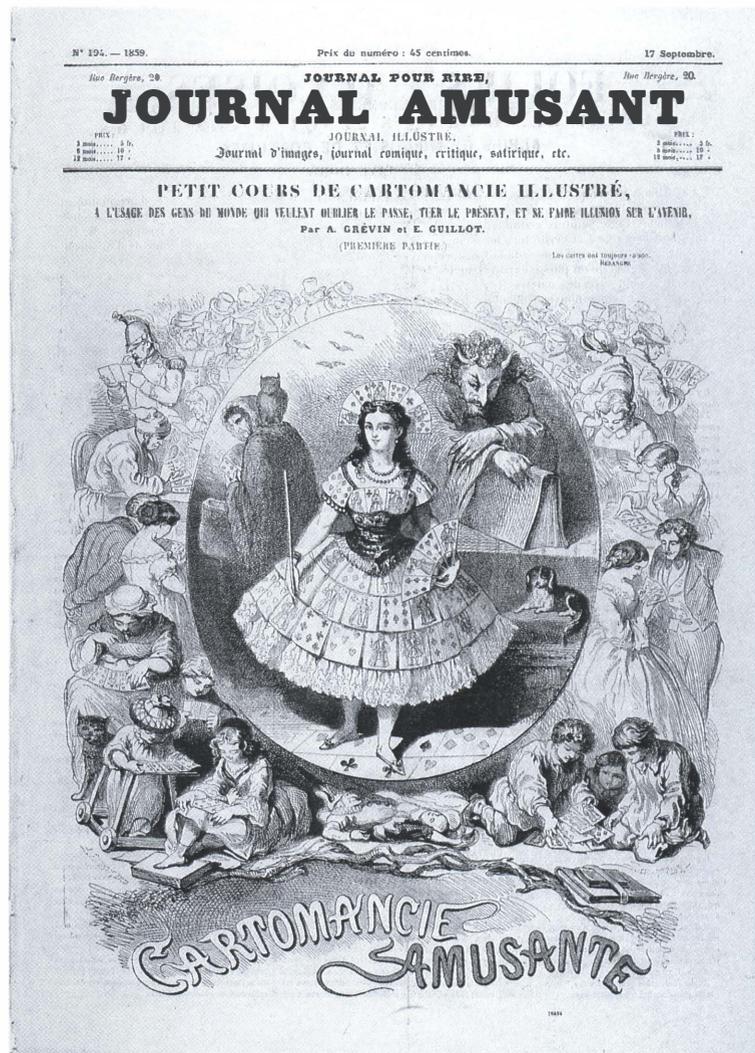
Abnormally High IQ

The Big Bang Controversy

Nostradamus Predicts Chess Winners

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Hilary Evans' Paranormal Picture Gallery



Le Skepticisme

For all their funny ways, the French cherish a streak of healthy skepticism which generally keeps them from going over the top. An outbreak of possession here, an epidemic of convulsions there, but nothing too serious.

But during the 1850s, the Believers were making notable inroads into the hearts and minds of French people. Hardly had the Fox sisters discovered how to converse with spirits, than mediums were crossing the Atlantic to demonstrate their skills (for a fee) in the Paris salons. Then, in 1858, Bernadette Soubirous was visited by Jesus's mother, turning up the heat beneath the constantly bubbling religious controversy. Encouraged by these events, the occult thrived in France to the point where table-turning parties became a fashionable social event. Fortunately for the good name of les Français, a few voices were raised in protest—among them, this spirited spoof on cartomancy which 'enables one to forget the past, obliterate the present and deceive oneself about the future...'

Hilary Evans is co-proprietor of the Mary Evans Picture Library, 59 Tranquil Vale, London SE3 0BS

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Sorry if we've missed anyone out! Please keep the clippings coming!

Hits and Misses

Steve Donnelly

Cosmic Car Parking

As a gentle academic rather than a hard-hitting journalist, I am always uneasy about reporting private conversations in *Hits and Misses* even when those conversations are with well-known personalities. However, the recent publication of an article in the *Sunday Telegraph* on 12 September enables me to recount a very useful secret to all readers who have difficulty finding car-parking spaces. The article in question was an interview with Katie Boyle (remembered from my youth as the lady in the Camay adverts) in which she talked about her sure-fire method for never having to wait for a space. She had revealed this method to me when we briefly met around the tea urn in the studios of Radio 5 more than a year ago. Ms Boyle's system, she had explained to me, is simply to invoke the spirit of her late second husband, who (as I later learned from the *Sunday Telegraph* article) was a gentleman by the name of Greville Bayliss. Ms Boyle regards her late husband as a sort of patron saint of parking and, when in need, simply says 'Darling, please find me a place on the right-hand side in Cavendish Square' or similar words and, Bob's your uncle (or Greville's your husband), some kind motorist immediately vacates an appropriate space.

A few weeks after our conversation, I was visiting friends in the Belgian town of Mons and, on a very busy Saturday morning, had been driven around town for ten minutes or more searching for a parking space without success. On remembering my conversation with Katie Boyle, I announced with great confidence that I had a method for finding a car-parking space and asked my friends on which side of the road (a one-way street with parking on both sides) they would prefer to find a space. In response to their request for parking on the right-hand side, I incanted the phrase 'Katie Boyle's dead husband, please find me a space on the right hand side of the road immediately' and, lo and behold, a small Citroën, that was parked at a meter immediately ahead of us on the right, pulled out and provided us with a space—elevating me to cosmic-master status in the eyes of my friends. This method has been in regular use in the Donnelly household since that date and almost always works. (... Well, it *quite often* works and when it doesn't, it is obviously because I'm not in the right frame of mind or perhaps because the late Mr Bayliss is engaged helping Ms Boyle or my Belgian friends at the time). I can strongly recommend the method to *Skeptic* readers. In the next issue, I'll give you some hints on how to change traffic lights to green by the power of mind alone...

Monkey business

If you have a small amount of money to invest and would like to become rich, don't get an investment consultant, get a monkey instead. According to the Scandinavia corre-

spondent of the *Daily Telegraph* in an article published on 8 September, a six-year-old chimpanzee has put together a portfolio of investments that has beaten a number of Sweden's leading financial experts. The chimp, by the name of Ola, was on loan to the business editor of *Expressen* and chose its investments by means of a list of companies and a dart. *Expressen* organised a competition between Ola and five other financial experts in which each was given £1000 to invest. After two months Ola had made profits 20% higher than the nearest rival. Unconventional ideas for making a killing on the stock market are not new in Scandinavia. For instance, Sweden's major business paper *Affarsvarlden* recently found that companies whose annual reports had fewer than 30 pages and no pictures gave good returns. *Skeptic* readers might prefer to stick to more conventional means of divining stock market performance such as astrology.

Bollards ✱

Religious belief is a funny thing, as most readers of *The Skeptic* will be aware, and over the ages, strange objects (and people) have been venerated by various sets of believers. There should, thus, be nothing whatever surprising about an object of devotion recently described in an article in the *Independent on Sunday*. The object in question is a large concrete traffic bollard situated (where else?) in San Francisco. Several years ago, a lorry driver (God in disguise, maybe?) dumped this rather large, phallic-shaped bollard in Golden Gate Park and, since that time, hundreds of worshippers have come from as far afield as India to meditate and burn incense in front of the four-foot high grey effigy. Some regard it as a *lingham*—a symbol of one of the chief Hindu gods, Shiva—as the bollard does bear more than a passing similarity to *linghams* in India. The bollard—or perhaps I should write the Bollard—is now normally draped with garlands, has religious symbols scrawled on its surface and has recently cured a man of arthritis.

Scottish stone curse ✱

Meanwhile, in Scotland, a rather similar, but somewhat older stone is being blamed for causing rather poor summer weather. Local legend in the highland community of Strathy states that, as a result of a 1000-year-old curse, if an ancient priest's stone is moved from its home on a Sutherland hillside, storms will follow. Unfortunately for local residents, earlier this year the stone was temporarily taken away by archaeologists to make a cast for public display. According to an article in *The Scotsman* on 13 September, local councillor, Rob Morrison reflects the views of many locals: 'I get a creepy feeling about moving things that are not meant to be moved. I would not treat moving the stone too lightly—this has been the worst summer I can ever remem-

ber'. Manchester had a fairly crappy summer too, but it's not clear whether the curse extended so far south or whether perhaps some other piece of rock was inadvertently moved, south of the border.

Cool music

Put away your green felt-tip pen. A better technique for improving the sound from compact discs than that of drawing green circles on them has recently emerged from the pages of *Audiophile* magazine. It's simple really; all you need to do is put your CDs in the freezer overnight although, according to an article in the *Observer* on 10 October, the complete procedure is somewhat more complicated. Firstly, the CDs must be put in a sealed plastic bag and then left in the freezer overnight. On removal the following morning, they must then be wrapped in a towel and stored in the fridge for a further 24 hours. The theory is that the freezing process will alter the molecular structure of the discs thus improving their quality—it's a pity the same thing doesn't occur with frozen foods.

Water loadarubbish

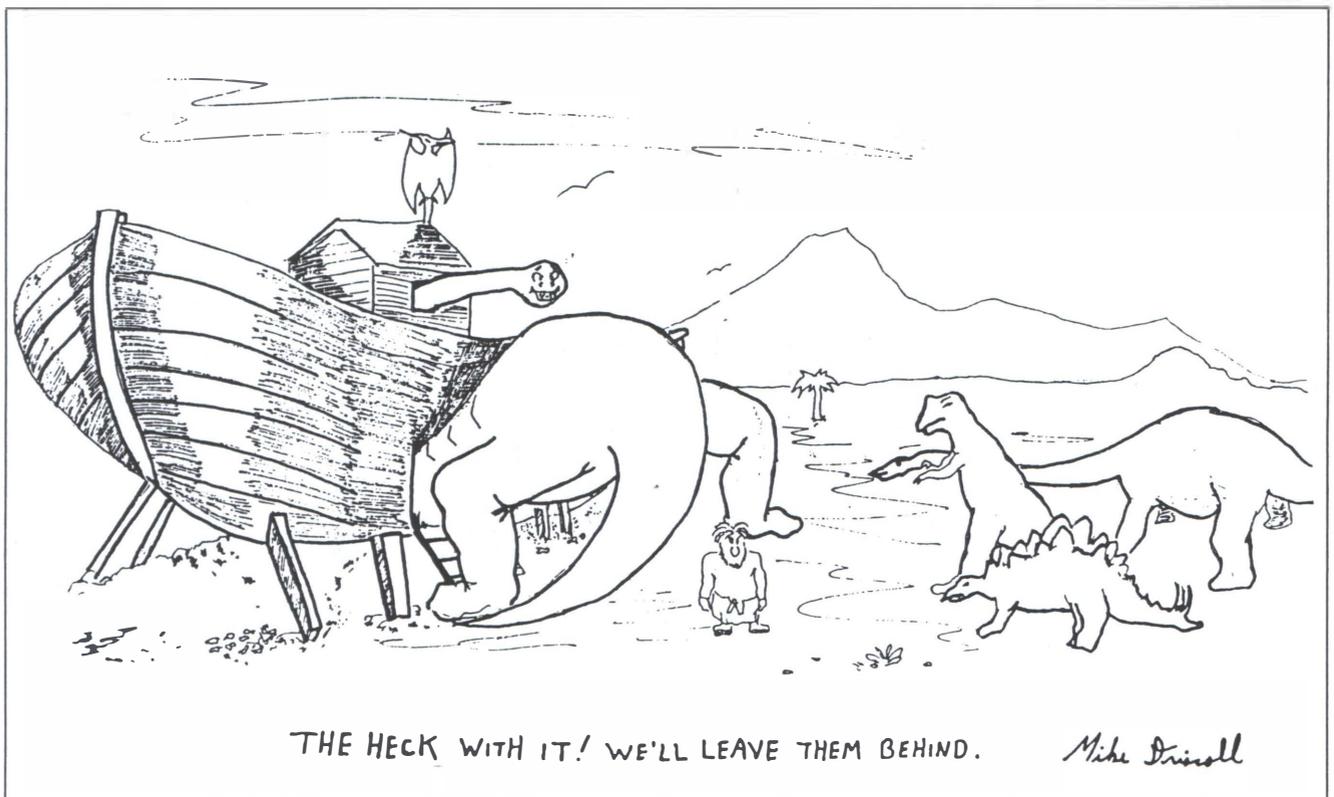
In these days of significant cuts in defense spending, it is a great relief to discover that, in some quarters, research is underway into a process that could save the Royal Navy a considerable amount of money without weakening our national defenses. The *Daily Telegraph* on 11 September reported that a former Controller of the Royal Navy, Admiral Sir Anthony Griffin, is working on plans to build an engine that uses good old H₂O as a fuel. Unfortunately, Sir Anthony has been beset by some minor problems, such as the occasional explosion in his garage where the work is taking place. 'It's all to do with extracting hydrogen from the

water', he explained. 'I'm on the verge of a breakthrough. The explosions occurred when I linked the machine up to the outboard motor'. The work is a collaboration between the Admiral and an American called Stanley Mayer who apparently drives round in a Volkswagen buggy which runs entirely on water. Sir Anthony is convinced that we will eventually have an entire fleet powered by water. Personally, I just hope that North West Water do not put the price of their product up to over 50p per litre to reflect its newly discovered calorific value.

Blind rider

If you are driving in the vicinity of Dijon, in France, in the near future you would be well advised to pull in to the side of the road if you see a powerful Suzuki motorbike coming in your direction. According to *Motorcycle News* on 8 October, hypnotist and faith-healer, Jean-Marie Laforgue has demonstrated that he possesses psychic powers by driving his motorbike along country roads after sticky pads were placed over his eyes and a black bag made of eight layers of material was placed over his head. Under normal circumstances, it would be expected that this procedure would have rendered Monsieur Laforgue a somewhat more dangerous driver than the average Frenchman. However, a television film-crew filmed the Frenchman's ride and apparently no mishaps occurred. 'I was not scared because I can see with my mind,' claimed the brave psychic, 'Concentrating enables me to see like a film camera'. Suggestions that Laforgue learned his route by heart or had a concealed radio-link with a support car were, no doubt, vigorously denied.

Steve Donnelly is a physicist and a reader in electronics and electrical engineering at the University of Salford.



THE HECK WITH IT! WE'LL LEAVE THEM BEHIND.

Mike Driscoll

At the Frontiers of Science

William R Corliss

Cataloguing the anomalies and curiosities of nature

I BEGAN COLLECTING SCIENTIFIC ANOMALIES about 30 years ago, after I had become intrigued by some apparent problems in geological theory. The advent of plate tectonics answered some of these nagging questions, but did not dampen my newly-found passion for observations that were not adequately explained by reigning scientific paradigms.

Of course UFOs briefly attracted my attention but, more importantly, so did the books of Charles Fort. It was, in fact, Fort's mention of the famed 'Barisal Guns' of the Ganges Delta (loud bangs of uncertain origin) that stimulated me to collect anomalies in earnest. For when I checked out Fort's Barisal Guns references in *Nature*, I also found on nearby pages a host of different scientific anomalies. Curiosity impelled me to begin searching for other puzzling manifestations of nature, and so I naturally commenced with *Nature*, Volume 1, dated 1870.

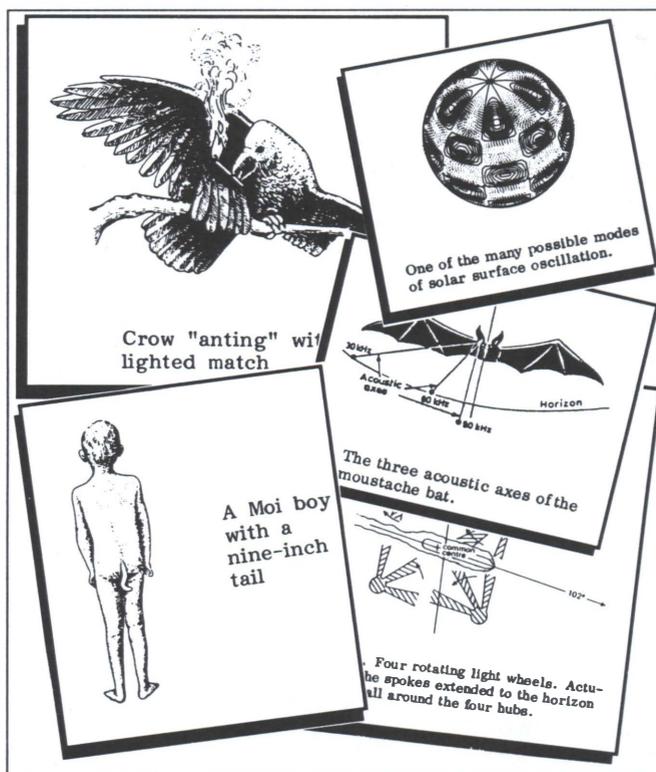
I had soon amassed enough geophysical and archaeological anomalies and curiosities to print up 2000 copies each of *Strange Phenomena* (volume G1) and *Strange Artefacts* (volume M1). Despite their notebook formats, these books sold well. The Sourcebook Project was formed in 1973 to handle these and future publications. To date I have published 10 of the loose-leaf Sourcebooks (Phase I), 6 hardcover Handbooks (Phase II), and 13 volumes in the *Catalogue of Anomalies* (Phase III). In addition, the Project publishes the monthly newsletter *Science Frontiers*.

I confess that my newsletter is only a teaser to tempt its readers to partake in a much larger, more comprehensive banquet: the *Catalog of Anomalies*. This work, now comprising 13 volumes of a projected 30, represents my entire file of some 40,000 items gleaned from a survey of about 14,000 volumes of science journals and magazines from

1820 to date. This massive hoard of scientific enigmas, paradoxes, and esoterica was assembled bit by bit from 363 volumes of *Nature*, 260 volumes of *Science*, 100 volumes of the *Journal of Geophysical Research*, and so on with other journals. I believe my collection is unique. It transcends modern computerized databases in its very wide time frame and its focus on the anomalous and curious.

The *Catalog of Anomalies* represents my personal attempt to assemble the riddles of science and, given a large array of them, to discern some meaning implicit in the mélange. On the practical level, which as a self-employed researcher I cannot avoid, my priorities have had to be as follows: Goal #1 has been the satisfaction of my own curiosity; Goal #2 has been the marketing of enough books to support my research, for no government offices or private foundations seem at all interested in supporting this new discipline of 'anomalistics'; Goal #3 has been more altruistic: the anticipation that there may be something scientifically useful in all this. But, even if there is not, the quest has been fulfilling in itself.

Some mainstream scientists may recoil at the thought of 40,000 anomalies and curiosities. Surely nature cannot be that enigmatic and cryptic! Actually, I must stress that my search is still *far* from complete. Anomalies—those observations that do not yield to mainstream explanations—are ubiquitous and proliferate. I have trawled through only a small fraction of the English-language scientific journals; thousands of volumes of specialized, less-known, publications gather dust untouched. Among them are unexamined books, monographs, informal papers, and popular publications. Foreign-language sources have only been sampled, and I can attest that the fishing there is good, too. And in today's electronic milieu, anomalies travel from computer screen to computer



screen, by e-mail, and by fax. What an immense untapped resource for the *Catalog of Anomalies*! From all this, I am certain that nature is even more anomalous than the contents of my files intimate.

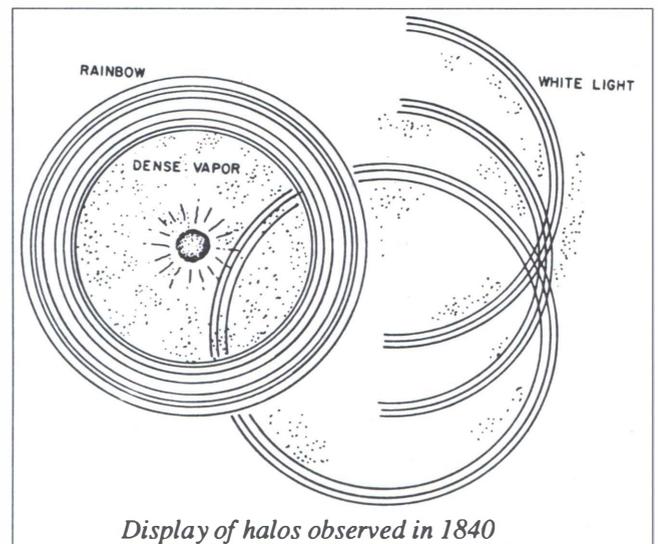
I admit freely that *Catalog of Anomalies* harbours a scattering of fraudulent and questionable data. I try to weed these out; but no database can be completely clean. On the other hand, I do not apologize for retaining phenomena upon which mainstream science has 'closed the book'. Didn't science do this to the idea of continental drift until the 1960s, only to canonise the concept in the 1970s? Now, one believer has recommended that data contradicting plate tectonics no longer be published! (Be assured that the pages of *Science Frontiers* will always welcome such waifs. Scientific political correctness is anathema here.)

Mainstream science's response to my collections has been remarkably favourable despite my obvious iconoclastic tendencies. For example, *Nature* has reviewed five of my books without recommending their immediate incineration; other science journals have been likewise generous. The most annoying comment in the scores of reviews in my file has been that science should not waste time with esoterica! This reviewer apparently forgot about that tiny, esoteric advance of Mercury's perihelion that resisted explanation until Einstein came along. Also troubling have been warnings by more than one reviewer that undergraduates should not be exposed to my books lest the image of science be tarnished.

I would warn against expecting anything profound to emerge from the simple process of collecting anomalies and curiosities. Data collection is, after all, only one part of the scientific process. I have avoided as far as possible the 'fun' part of science: theorisation. My purpose has been to keep the database as value-free as possible. It is this value-free aspect of the *Catalog of Anomalies* plus the eclectic nature of my search that makes my endeavour not only entertaining but liberating. I will explain what I mean by 'liberating', and why this feature of anomalistics might be scientifically useful. Unless you have been comatose the past several years, you must know that the entire outlook of science is in flux. The words 'chaos' and 'complexity' are the current buzz-words. They betoken, finally, the formal recognition by science that nature is frequently:

- *unpredictable*, as in weather forecasting beyond a few days;
- *complex*, as in any life-form;
- *non-linear*, as in just about all *real* natural phenomena;
- *discontinuous*, as in saltations in the fossil record;
- *out-of-equilibrium*, as in *real* economics and even the natural world.

Eroding fast are the philosophical foundation-stones of the clockwork universe: the idea that nature is in balance, that geological processes are uniformitarian, that life evolved in small, random steps, and that the cosmos is deterministic.



Display of halos observed in 1840

My view is that anomaly research, while not science *per se*, has the potential to destabilise paradigms and accelerate scientific change. Anomalies reveal nature as it really is: complex, chaotic, possibly even unplumbable. Anomalies also encourage the framing of rogue paradigms, such as 'morphic resonance' and the steady-state universe. Anomaly research often transcends current scientific currency by celebrating bizarre and incongruous facets of nature, such as coincidence and seriality. However iconoclastic the pages of my books, the history of science tells us that future students of nature will laugh at our conservatism and lack of vision.

Such heavy philosophical fare, however, is not the main diet of the anomalist. The search itself is everything. My greatest thrill, prolonged as it was, was in my forays through the long files of *Nature*, *Science*, the *English Mechanic*, the *Monthly Weather Review*, the *Geological Magazine*, and like journals. There, anomalies and curiosities lurked in many an issue, hidden under layers of library dust. These tedious searches were hard on the eyes, but they opened them to a universe not taught by my college professors!

And the end is not in sight. To wax Whitmanesque, when presently recognized anomalies are duly interred under an overburden of theory, still more will arise. And this is as philosophical as I care to get.

William R Corliss is a physicist turned writer, and the author of 50 books on various aspects of science and technology.

This article is adapted from the Preface to the author's most recent book, Science Frontiers: Some Anomalies and Curiosities of Nature, a collection of around 1500 items of science news and research originally published in the first 86 issues of Science Frontiers.

For details of the Sourcebook Project, including details about obtaining Science Frontiers, and the author's books, contact The Sourcebook Project, PO Box 107, Glen Arm, MA 21057, USA.

Understanding Creativity

Margaret Boden

Unravelling the mysteries of creativity

CREATIVITY CAN BE scientifically understood with the help of computational concepts. This may seem surprising, not to say absurd. Most people take for granted that there can be no interesting relation, only utter incompatibility, between computers and creativity. Indeed, most people assume that there will never be any scientific theory of creativity—for how could science possibly explain fundamental novelties? The very notion seems to be a contradiction in terms.

In fact, however, computers and creativity make interesting partners with respect to three rather different sorts of project. One is psychological: understanding human creativity. One is technological: trying to produce computer-creativity. And the third is pragmatic, even educational: using computers to aid one's own creativity.

Human creativity is something of a mystery, not to say a paradox. Artists and scientists rarely know how their original ideas come about. They mention intuition, but cannot say how it works. Nor can they say clearly how creativity can be recognized. One new idea may be *creative*, while another is merely *new*: what's the difference? And how is creativity possible?

Some ideas we call creative are merely novel combinations of familiar ideas. Much poetic imagery, or analogy in science, is of this type. Psychometric measures of creativity usually identify 'creative' ideas in terms of their statistical improbability [1], and such tests are best-suited to capturing creativity of this 'combinational' type. As well as measuring it, the psychologist needs also to be able to explain this sort of creativity.

Imaginative association (whereby vastly different ideas, as well as similar ones, may be related), and the recognition of analogy, can each be illuminated by computational models. Association takes place by means of mental processes comparable to (though often much richer than) the parallel-processing defined within connectionist AI-models, or neural nets [2]. The origination of the haunting imagery of Coleridge's poem *The Ancient Mariner*, for instance, can be largely understood in these terms [3, Chapter 6]. As for analogy, which often effects a permanent change in one's perception of something, this too has been modelled in AI-terms [4, see also 5].

Combinational creativity, surprising though its results can be, is less arresting than some other cases of originality. A novel combination of two familiar ideas is something which *did not* happen before. By contrast, some creative



ideas surprise, shock, and delight us because it seems that they *could not* have happened before. Relative to our expectations, they are not just improbable, but impossible.

Combination-theory cannot capture this distinction. An adequate scientific account of creativity needs to be able to do so. Also, it must show clearly how apparently impossible ideas can in fact arise. And it must explain in what sense one impossible idea can be more impossible, more creative, than another.

Non-combinational creativity involves the exploration, and in the most interesting cases the transformation, of conceptual spaces in people's minds. Conceptual spaces are styles of thought. They include ways of writing prose or poetry; genres of sculpture, painting, or music; theories in chemistry, biology, or mathematics; habits of couture; systems of choreography . . . in short, any reasonably disciplined way of thinking.

Within a given conceptual space, many thoughts are possible—even if some of them are never thought. Others are impossible. If you are skilfully writing a limerick, iambic pentameters simply cannot drop from your pen. But if you want to write a new sort of limerick, or a non-limerick somehow grounded in that familiar style, then blank verse could perhaps play a role. The deepest cases of creativity involve someone's thinking something which, with respect to the relevant conceptual space present in

their minds, they *could not* have thought before. (It follows that *constraints* are essential to creativity, even if creativity largely consists of overcoming them.)

The obvious next question is how this supposedly impossible idea could possibly come about. And the answer is that the creator must change the pre-existing style in some way. It must be tweaked, or even radically transformed, so that thoughts are now possible which (within that space) were not conceivable before. To understand how this can happen, we must understand clearly what conceptual spaces are, and what sorts of mental processes could explore and modify them.

Styles of thinking are studied by literary critics, by musicologists, and by historians of art, fashion, and science. And they are appreciated by us all. But intuitive appreciation, and even life-long scholarship, may not make their structure entirely clear. Indeed, the unclarity may be proclaimed as unavoidable by the most scholarly of critics. (An architectural historian said of Frank Lloyd Wright's Prairie Houses, for instance, that their 'principle of unity' is 'occult' (cited in [6]). By this he seemed to mean not merely that he had not managed to identify it, but that it must remain forever hidden to human eyes.) Even when a scholar does claim to have discovered a certain style's principle of unity, it may not be stated clearly enough for scientific purposes.

This is the second point at which computational methods can help. Conceptual spaces, and ways of transforming them to produce new ones, can be clearly described by using computational concepts. These concepts are drawn from artificial intelligence (including, but not confined to, connectionist AI), and they enable us to do psychology in a new way. A conceptual space can be thought of as a generative system: a more or less complex set of rules which define the relevant dimensions, and specify ways in which a range of structures (ideas) can be generated.

In this way, the structure of tonal harmony [7], the

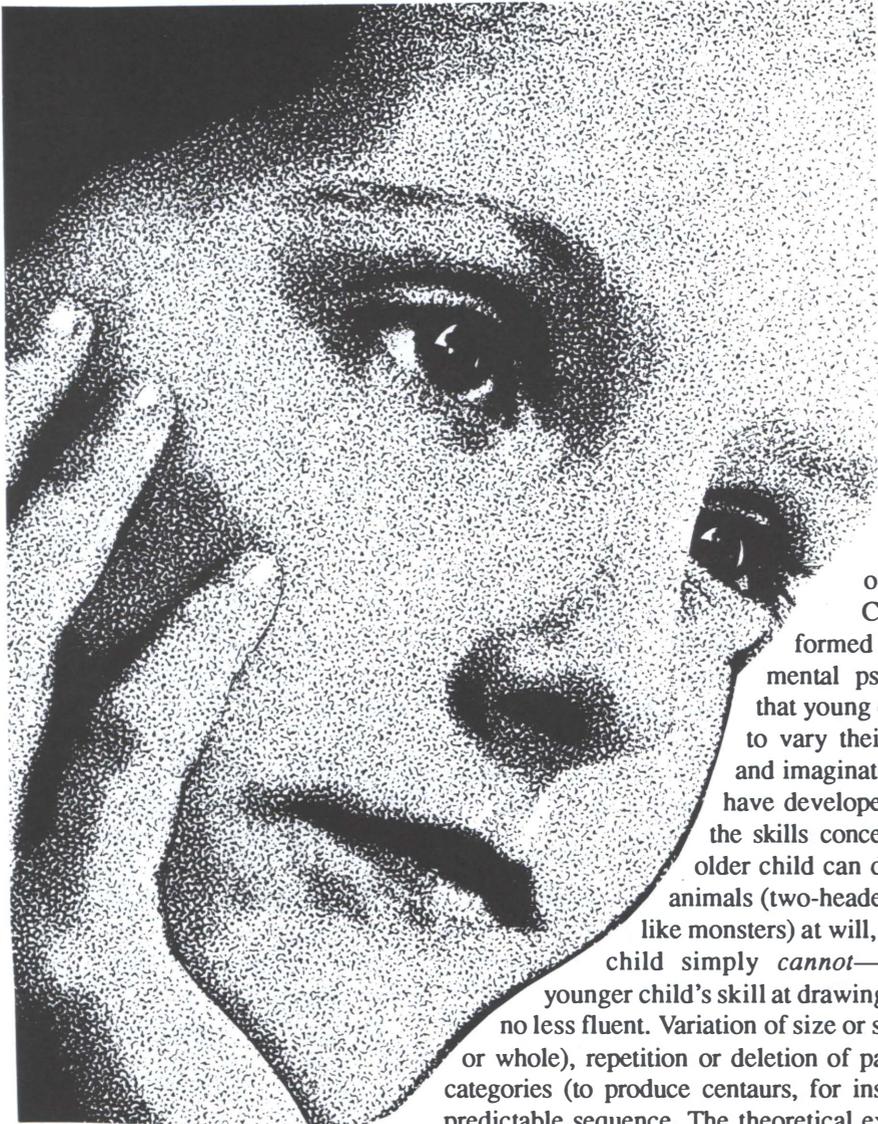
'grammar' of Prairie Houses [6], and spaces of many other sorts can be clearly expressed. Then, the power of the computer may be exploited to study various ways of exploring the relevant domain. And methods ('heuristics') for navigating, and even for changing, highly-structured spaces can be examined and compared.

One implication of this account of creativity is that a creative system, whether mind or machine, needs internal 'maps' of its own conceptual spaces [3, Chapter 4]. These maps, which may exist on many different levels, enable the system to move within the relevant spaces, to test their

limits and boundaries, to modify them, and even to transform them. Thus one way, probably the most important way, in which Mozart was different from the rest of us is that his mind contained more richly-detailed maps of musical structures, and more ways of negotiating them fruitfully, than other people's.

Computationally-informed work in developmental psychology suggests that young children are unable to vary their skills in flexible and imaginative ways until they have developed internal maps of the skills concerned [8]. Thus an older child can draw many 'funny' animals (two-headed dogs, or centaur-like monsters) at will, whereas a younger child simply *cannot*—even though the younger child's skill at drawing normal animals is no less fluent. Variation of size or shape (of parts and/or whole), repetition or deletion of parts, and mixing of categories (to produce centaurs, for instance) appear in a predictable sequence. The theoretical explanation is that a skill which is fluent may be merely 'compiled': it can be run, but not varied. To be varied, it must be redescribed at some higher level (or levels), in terms of specific parameters and subroutines. These 'representational redescriptions' not only transform line-drawing (and language [9]) into a more creative activity, but underlie the development of conscious self-reflection.

What of the second link between machines and creativity? Can computers be creative? That is, can they produce performance of a kind which we would regard as creative if we saw it in human beings? (This is a scientific question. For present purposes, we may ignore the non-scientific, philosophical, question of whether a computer, *no matter*



how humanlike its performance, could 'really' be creative [3, Chapter 11].)

The answer to this question is 'Yes'. A number of programs already exist which can *explore* a given space in acceptable ways. For example, a computational grammar has not only shown what the principle of unity of Prairie Houses actually is, but has generated designs for new ones, previously undreamed-of [6]. Some programs can generate thousands of line-drawings in a certain style, pleasing enough (if hung on one's walls) to be spontaneously remarked upon by unsuspecting visitors [10]. Others improvise unpredictable melodies, and accompaniments, from a modern-jazz chord sequence [11, 12]. Yet others come up with (occasionally, brand-new) scientific hypotheses [13, 14].

A few programs can even *transform* their conceptual habitat, alter their own rules, so that interesting ideas result. For instance, programs using genetic algorithms (see below) have come up with optimal solutions to a number of difficult problems. One such problem concerns accidental leaks in huge gas-pipelines, running across many different countries. A self-transforming, 'evolutionary', program can infer the position of the leak on the basis of hourly measurements taken at various points along the pipeline [15]. These measurements include the gas-inflow, gas-outflow, inlet-pressure, outlet-pressure, rate of pressure-change, season, time of day, time of year, and temperature. As well as finding the leak, the program can recommend emergency-action (specifying which pumps should be turned off, which valves should be closed, etc.)

Many of the ideas generated by current computer-models of creativity were already known to human beings (though not specifically prefigured within the program's initial conceptual space). But the definition of creativity adopted within this article is a psychological one: the ability to come up with an idea which, relative to the pre-existing domain-space in one's mind, one could not have had before. Whether any other person (or system) has already come up with it on an earlier occasion is irrelevant. That is a historical question, not a psychological one.

Moreover, at least one entirely unknown mathematical theorem has been suggested by a computer, whose programmer had never even heard of the branch of mathematics concerned [16]. The program, using its initial concepts and its exploratory/transformational rules, found its own way into the new mathematical space, by creating that space for itself.

The third way in which computers and originality are related involves the use of these machines to help our own creativity. A number of graphic artists, film-animators, and industrial designers are using computers as genuine partners in their creative quest. The machines in question execute 'evolutionary' programs, continually making random changes in their current rules so that entire new forms, new species, of structure result. The human being continually chooses the ones he or she finds most interesting, and the machine concentrates on them.

For instance, an image-generating program [17] uses self-modifying 'genetic algorithms' (modelled on biological mutations) to generate new images, or patterns, from

pre-existing ones. At each 'generation', the selection of the 'fittest' examples is done by the programmer—or by someone fortunate enough to be visiting his office while the program is being run. That is, the human being selects the images which are aesthetically pleasing, and these are used to 'breed' the next generation. The programmer's aim, in this case, is to provide an interactive graphics-environment, in which human and computer can cooperate in generating otherwise unimaginable images. (At present, this program runs only on the Connection Machine, a massively parallel computer costing 15 million dollars.)

A similar method is used by the sculptor William Latham, to generate 3D-forms likely to satisfy specific aesthetic constraints [18]. So as not to jeopardize those constraints, Latham allows self-transformations only at relatively superficial levels in the program (changes in parameters, not functions). In consequence, the varying forms are much less diverse than those produced by Sims' system.

Sims' computer-generated images often cause surprise greater than that caused by mere random unpredictability. It is as if, besides our being unable to predict heads or tails when tossing a coin, the coin sometimes showed a wholly unexpected design. If one compares a parent-image with some of its descendants (or even some of its immediate offspring), one may be amazed by the difference. The change(s) effected to the earlier image on the way to the later one sometimes seem like relatively unadventurous exploration, or tweaking. The colour of what is clearly the same image may have been altered, for instance, and/or the lines may obviously have been blurred. Sometimes, however, one cannot say, merely by looking at the chosen image-pair, how they are related—or if they are related at all. The one appears to be a radical transformation of the other, or even something entirely different. (It does not follow that Sims' program is 'better' than Latham's: if the artist-programmer is trying to achieve a particular type of aesthetic effect, the system's freedom of transformation must be limited.)

In sum, there are many intriguing relations between creativity and machines. Computers can sometimes do creative things, and some can help us to do so. Not least, a computational approach can clarify many questions about our own creative powers. It gives the psychologist a way of seeing more clearly into the rich subtleties of the human mind.

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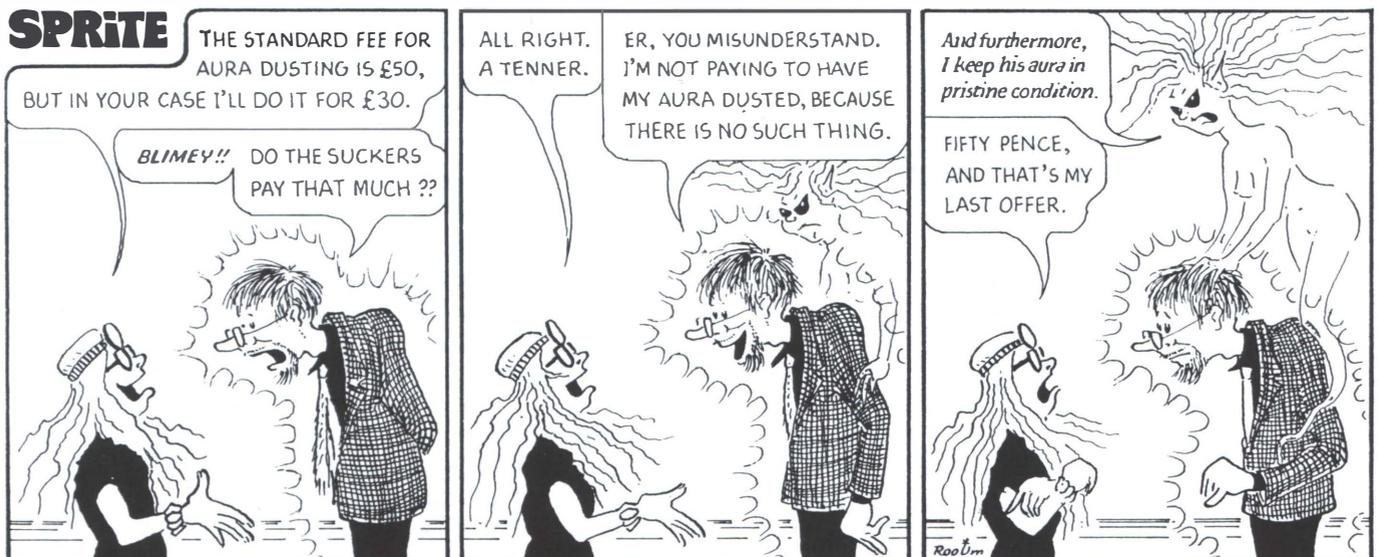
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A Supernatural IQ?

Andrew M Colman

Investigating a claim to an extraordinary IQ

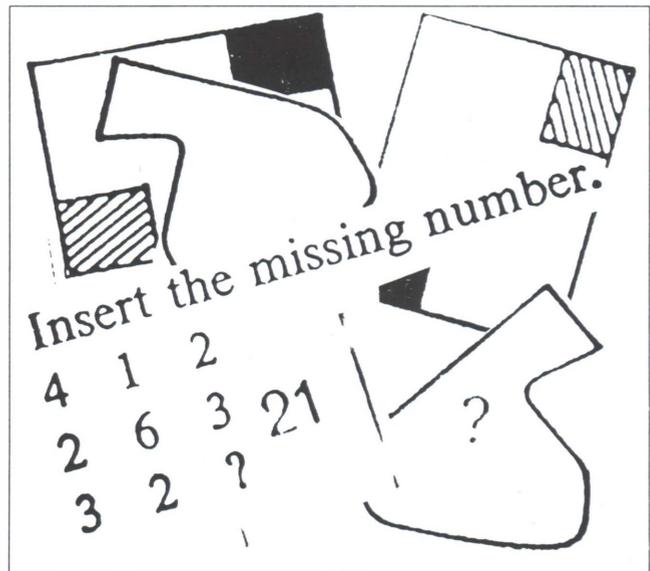
A REPORT CIRCULATED by United Press International described Marilyn vos Savant as the possessor of the 'the world's highest IQ' [1]. In the same year, *The Guinness Book of Records* cited her IQ as 228 [2]. After the publication of her own (co-authored) book, *Brain Building: Exercising Yourself Smarter* [3], this claim was widely repeated, even by a reviewer in the *Skeptical Inquirer* (Summer 1991, p. 415). As reported in the same issue of the *Skeptical Inquirer* (p. 342), Marilyn vos Savant's weekly column in *Parade* magazine carries a byline noting that she is listed in the Guinness Hall of Fame for her 'highest IQ'.

Paranormal claims can usually be challenged only on the basis of empirical evidence, and the history of ESP research shows how difficult and inconclusive that process tends to be because of the inherently controversial nature of the data [4]. Marilyn vos Savant's supernatural IQ, on the other hand, provides a tempting opportunity for an entirely different and more decisive line of attack. I believe that her claim to an IQ of 228 can be refuted on purely logical (or mathematical) grounds, without the necessity of any messy and potentially controversial empirical testing at all.

The Original Concept of IQ

It is necessary first to explain the concept of the intelligence quotient or IQ. As its name suggests, it originally referred to the result of dividing one number (mental age) by another (chronological age). Chronological age is simply age in the ordinary sense of the word. Mental age is a slightly less familiar but equally uncomplicated concept. It was originated by the French psychologists Alfred Binet and Theodore Simon, who constructed the first useful intelligence test in 1905. It is most easily explained with a simple example. If a 10-year-old child can solve only those problems on an intelligence test that an average 7-year-old in the standardization sample (used to establish test norms) could solve, then the child has a mental age of 7 and may be said to be mentally retarded by about three years. Another 10-year-old child who can solve as many problems as an average 12-year-old in the standardization sample may be said to have a mental age of 12 and to be well above average.

The German psychologist William Stern pointed out that mental age, on its own, does not indicate intelligence [5]; before we can form an opinion as to the child's intelli-



gence, we need to compare a child's mental age with his or her chronological age. Stern originated the idea of dividing mental age (MA) by chronological age (CA), and he called the resulting fraction the *intelligence quotient*.

A few years later, the American psychologist Lewis Terman [6] introduced the abbreviation IQ and suggested multiplying Stern's fraction by 100 to convert it to a percentage, yielding the well known definition, $IQ = MA/CA \times 100$. Although IQ is defined like that in most elementary textbooks of psychology, the formula is in fact obsolete in modern psychometric theory.

The Statistical Definition of IQ

The old-fashioned formula was abandoned for a number of reasons. One rather serious problem was that it yielded absurdities when applied to the measurement of adult intelligence. After the age of about 17 or 18, most people show no further increase in intellectual ability. In other words, mental age tends to stabilize, and in later life it may even decline, but chronological age, regrettably, marches on. Average 40-year-olds perform at about the same level on IQ tests as average 20-year-olds, but according to the old formula a 40-year-old performing at the level of an average 20-year-old would have an IQ of $20/40 \times 100 = 50$, which would seem to indicate severe retardation. This is obvious nonsense, because this 40-year-old could at the same time be performing at the level of an average 40-year-old!

In 1939 the American psychologist David Wechsler introduced a new definition of IQ that has been almost universally adopted by subsequent psychometricians [7]. Scores on any test are converted to IQs by equating the mean (average) score in the standardization sample to 100 IQ points and the standard deviation (which is a statistical index of dispersion or scatter among the scores) to 15 IQ points. Assuming that IQ scores are distributed according to the familiar bell-shaped normal distribution, for which there is a great deal of empirical evidence [8], this means that *by definition* 50 per cent of people score above 100, 16 per cent score above 115, 3 per cent score above 130, 0.13 per cent score above 145, and so on—these percentages can be looked up in published tables of the normal distribution.

Marilyn vos Savant's Unbelievable Score

Let us examine the credibility of Marilyn vos Savant's claimed IQ by extrapolating the above calculations. In terms of the statistical definition, an IQ of 228 is 8.53 standard deviations (8.53×15) above the mean of 100. It is impossible to look up the area under the curve in this region because the published tables do not go anywhere near 8.53 standard deviations above the mean ($Z \geq 8.53$). There is, however, a formula [9] that yields an approximation with negligible error, and according to this formula the probability corresponding to the area under the curve beyond 228 is less than $p = 10^{-17}$. This means that the probability of any specified person having an IQ of 228 or more is less than 1 in 100 000 000 000 000 000, that is, less than one in a hundred million billion.

Taking into account the fact that there are a little over 5 billion people in the world, the probability of finding *anyone at all* with an IQ of 228 or more is still indistinguishable from zero. Since the probability of a single IQ falling in the range above 228 is less than $p = 10^{-17}$, and the world's population is greater than $n = 5 \times 10^9$, the probability that anyone in the world has an IQ > 228 is less than

$$1 - (1 - p)^n = 5 \times 10^{-8},$$

which means that the odds against the event occurring are greater than 20 million to 1. The prudent punter would not wish to bet on there being anyone with such a high IQ.

Conclusions

There are only two logical possibilities arising from these calculations. Either Marilyn vos Savant really does have an IQ of 228, in which case a genuine miracle has occurred, or alternatively her IQ is spurious. Common sense bids one to prefer the latter interpretation. This in turn leads to the following paradox. If Marilyn vos Savant were really as supernaturally intelligent as she claims to be, then she would surely have done the calculation in her head (without the need for an approximation formula, perhaps), and on seeing the result she would immediately have disavowed her bogus IQ, realizing that no one could be as paranormally intelligent as that. To quote from Marilyn vos Savant's own book: 'your intellectual ability can be described as your ability to distinguish, to a finer and finer degree, sense from nonsense'.

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The Big Bang Controversy

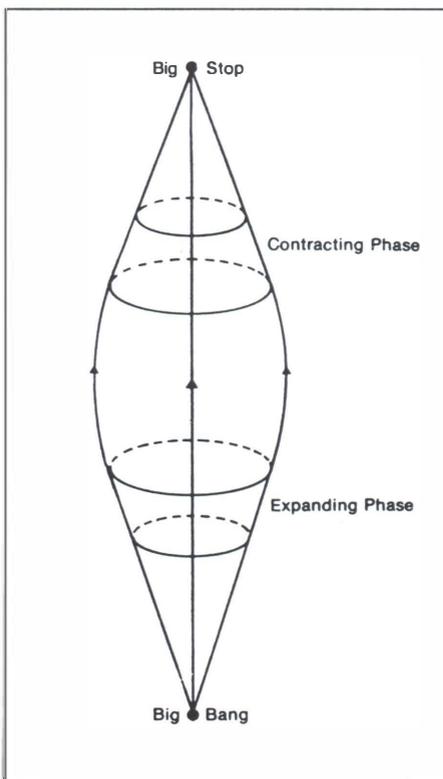
Taner Edis

A look at pseudoscience in cosmology

THE 'BIG BANG' is one of modern cosmology's most widely known theories: the origin of the entire universe in the explosion of an infinitesimal point, and its expansion ever since. However, the details of this theory are far from complete, and there are a few who argue that much research in this field is not 'good science', because of the influence of aesthetic prejudices, mysticism, and religious ideals. So, what is the 'Big Bang controversy'?

Any theory that explains the history of the observed universe by an explosive expansion from a very highly compressed initial state is a Big Bang theory. So 'the Big Bang' is really a family of theories rather similar to the way that biological evolution is a family of theories that explain the history of life by descent with modification, including theories of Neo-darwinism, hopeful monsters, punctuated equilibrium, and so on.

Again analogously to evolution, the Big Bang as a cosmological idea is broad enough that sniping at details of the current frontrunner will not bring down the theory as a whole: many members of the same family are waiting to



take its place. For example, the usual Big Bang theories declare that the element boron should have been formed only in the primeval explosion, and thus is comparatively rare. However, boron now be observed in unexpected abundance, variant Big Bang theories that postulate a non-uniform expansion that would allow for more boron are strengthened.

Lest the Big Bang start look-

ing like an invulnerable, thus uninformative cosmology, we can immediately state that it is falsifiable. At the least, all Big Bangs give us an expansionary universe. There are other, similar, fundamental positions that can be attacked to damage the Big Bang. However, a more interesting case would be that of not ruling out a Big Bang, but forcing increasingly complex and forced variants of it to take centre stage. In this case, alternative cosmologies that present cleaner solutions get an opportunity to become the dominant view.

So, there are two general questions of interest to skeptics. The first is the probability of a Big Bang according to the information currently available. Cosmology is not a minor question in the public mind, and we'd like to know if the Big Bang is as reliable as presented, since we use it to a degree in countering the pseudoscientific claims of the 'Creationists'. Plus it helps to be informed. If ideally—though imperfectly—science is a process that embodies constructive skepticism in action, we'd better know a bit about the current state.

The second question is probably more interesting, as controversy enters. Some critics of Big Bang cosmologies are not content to claim that these are not well supported, but add that there is a decidedly unscientific character in the way that the enterprise of cosmology is conducted today. In that there is an accusation of pseudoscience residing in the physics departments of universities, using a skeptic's language and forms of argument, this is something that deserves our attention.

In this article I will give an overview of the physics involved in the Big Bang. My main sources for the strong claims against the Big Bang are Eric Lerner's book *The Big Bang Never Happened*, and the essay by Geoffrey Burbidge of UCSD in February 1992's *Scientific American*. Both are worth a glance, though as a warning, Lerner's book is very strident and includes enough ridiculousities to obscure material that is worth consideration. Burbidge's theories are associated with Hoyle and Wickramasinghe, who certainly do not shrink from weird propositions (life from outer space, faked *Archaeopteryx*...).

The Big Bang and its inadequacies

The main strengths of a Big Bang cosmology that has gravity as the main force that matters, and thus general relativity as the theoretical context to operate in, are three-fold. Much help, though, is needed from particle and nu-

clear physics.

The most obvious strength is the observation that the universe appears to be expanding, in a rather uniform fashion: the distance of a galaxy to us, and its speed away from us, are proportional. The speed is determined by the famous 'redshift', something that jumps easily out of general relativity. It becomes plausible to think it all started out from an initial explosion. There is some uncertainty about the proportionality constant (the Hubble constant), but using it we get the usual 'age of the universe' of around 20 billion years. Then, and what impresses physicists the most, there is the cosmic 'microwave background' radiation. One would expect that at some point after the Big Bang, usual matter and photons (radiation) would decouple, leaving a cosmic 'radiation noise' that comes uniformly from all around, and does not deviate from a constant temperature spectrum. Finally, the Big Bang has proved useful to obtain abundances of light elements such as hydrogen and helium. The other elements are mainly produced within stars and the like. Not bad, but observational problems were quick to appear.

I won't detail the particular problems that led to the introduction of the idea of 'inflation', a period of exponential expansion very shortly after the Big Bang. This expansion would give—without incredible fine tuning of parameters—a microwave background that was *very* smooth as observed, a universe that would appear flat (as far as we can see, space is not strangely warped, but much like what we'd expect from ordinary geometry), and provide a source of energy for the whole explosion. So the situation would be that inflationary Big Bang theories explain a lot about cosmology, and have problems, but not more than what makes for a healthy and exciting field of research. Some observational and theoretical questions must be noted, however.

Inflation would make space about flat, and in the context of the Big Bang, this curvature is determined by the density of matter in the universe. But what we see in the way of ordinary matter is not more than 10% (perhaps an optimistic estimate) of what would be necessary. So cosmologists have taken this as a sign that something called 'dark matter' exists, and that this would supply the missing gravity. The evidence for the presence of this, about 90% of *all* matter, is slim. There is little observational evidence, and claims that galaxy rotation speeds provided indications of at least some of it can be brought into question. Particle physics has produced an exotic zoo of unobserved candidates, and no great reason why they should be present outside of imaginations.

The problem that has attracted most attention is that of

large scale structure in the universe. With the Big Bang, the lumpiness of the universe, in the forms of stars, galaxies, and so on, should go away at some scale, where the distribution will look uniform. The age of the universe, around 20 billion years, gives us constraints on this scale— after all, things must have time to form. Plus, the only mechanism provided is that of quantum fluctuations (even a vacuum does not sit still in a quantum world) in the early universe expanding out to provide for the large unevenness we see today (gravity, the dominant force in current cosmology to the extent of ignoring others, can't do the job alone).

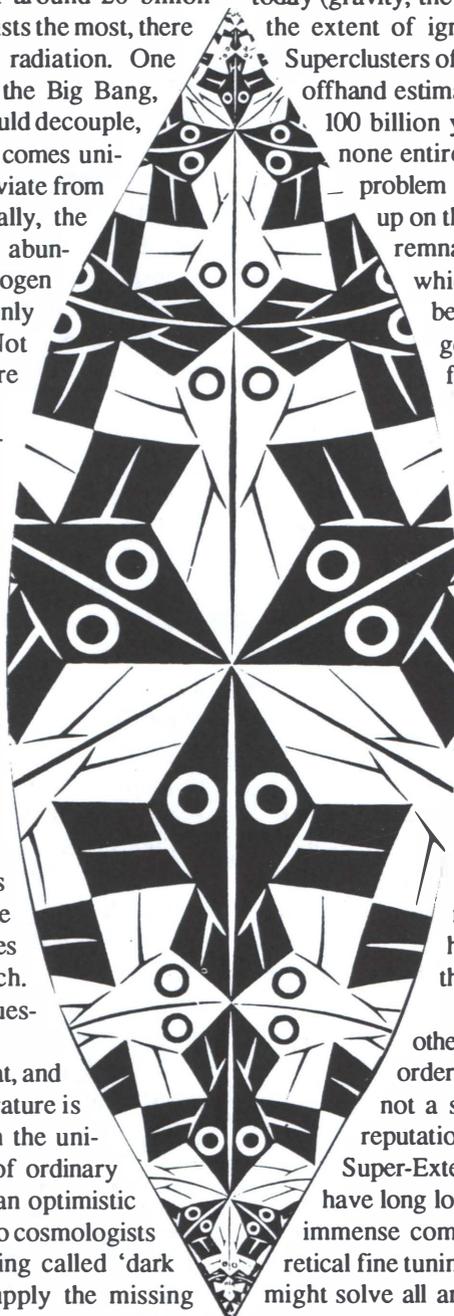
Superclusters of galaxies observed today are so large that offhand estimates for times of formation easily reach 100 billion years. There are ways to avoid this, but none entirely free of problems. Then, there is the problem of this degree of clumpiness not showing up on the microwave background (since this is a remnant, we should see effects of fluctuations, which would have to be before decoupling to be large enough). Recent observations suggest that at the largest scales looked at so far, structures are within Big Bang allowances, but questions remain.

Alternative theories

It is entirely possible that the Big Bang family will generate its own candidate that will work nicely to cover all bases. A truly successful quantum gravity theory could provide a basis for the Big Bang event itself, along with solving all its problems. Clearly, none of the difficulties mentioned mortally wounds the fundamental Big Bang idea. But, while cosmologists prefer this line of continuing research, it is worthwhile to ask if this is the best use of resources. For if the potential of cosmic generative explosions is not exhausted, we still may be at a point where the limits of it are strained.

Having to introduce Dark Matter and other 'predictions' in an *ad hoc* manner in order to save the theory from observation is not a sign of health. Neither is the fact that reputations can be made by discussing 'New-Super-Extended-Hyper... Inflationary' theories that have long lost contact with experiment and introduce immense complication, in the name of solving theoretical fine tuning problems. A more fundamental theory might solve all and preserve an explosion at the dawn of time itself. But, with the lack of such a definitive case, non-Big Bang cosmologies have an opportunity.

The climate of cosmology today is one of confidence in the Big Bang, so alternatives among true cosmologists' work is rare. And all are relatively unknown; though in a physics department, only a student and perhaps more open to new lunacy, I know of only two, and not through normal scientific channels. The Hoyle, Burbidge *et al* cosmology



is a variation on the old 'Steady State' universe. This picture involves a universe with no definite beginning in time, but with continuous, steady creation of matter that then joins an expanding universe. The improved version incorporates some Bang ideas, creation taking place in a 'series of Little Bangs'. A merit of the theory is said to be that inflation, which has some arbitrariness to it in the standard Big Bang, occurs naturally in this cosmology. Though I am not competent to evaluate this scenario, my impression is that it's not likely to be a winner.

The more interesting contender that I know of, coming from outside of the astrophysics community, is 'plasma cosmology'. The basic premise here is that known but complex plasma processes, observed in the laboratory, can be scaled up to astronomical distances. Thus electromagnetism becomes a major force in giving structure to the universe. Naturally, those who push this idea are plasma physicists, primarily the Nobel laureate Hannes Alfvén. The formation of galaxies and clusters is driven by plasma processes, a thin gas of ions and electrons admitting currents and instabilities called 'filaments'. Structures arise easily, and the claim is that outer space, not being just a simple vacuum, allows plasma descriptions to account for large scale clumpings. A number of nasty astrophysical problems appear approachable in this manner.

There are many fascinating details, but we can focus on the form in which it can be cast so as to threaten the Big Bang. Firstly, time scales that are definitely beyond the accepted 'age of the universe' are needed for large structure formation. This is accepted, not taken as a flaw.

The Big Bang theories can predict about 25% helium in the universe, almost all as a result of a primordial process. Plasma cosmologists propose a less cataclysmic way of getting it: through shock waves (from supernovae, amongst other objects) in galaxies. They also say that the energy involved in such a mechanism is just what is needed to produce the microwave background. The interesting aspect, its smoothness, is explained by scattering of radiation from plasma filaments, much like a smooth, diffuse light from all around being seen in a fog, because of scattering from droplets in the air. This mechanism is said to generate specific predictions that match the observations better than conventional models.

A pillar of the Big Bang theory is, of course, the expansion of the universe. But we need not just straightforwardly extrapolate everything back to a point. One scenario is that of an explosion, local in a much larger universe, that starts out with what we see in a much smaller volume, but nothing like the microscopic scale of a Big Bang. Alfvén has proposed matter-antimatter annihilation as a power source, which might be somewhat plausible (the initial assumption that equal amounts of matter and antimatter would mix rather uniformly and all go up in smoke is incorrect, since separation and explosion away driven by contact along a layer is possible). Others, like Burbidge's many Little Bangs, can be postulated.

Orthodoxy and metaphysics

Physics does develop its rigidities. Ignoring controversial ideas is not unknown, and probably to be expected in fields

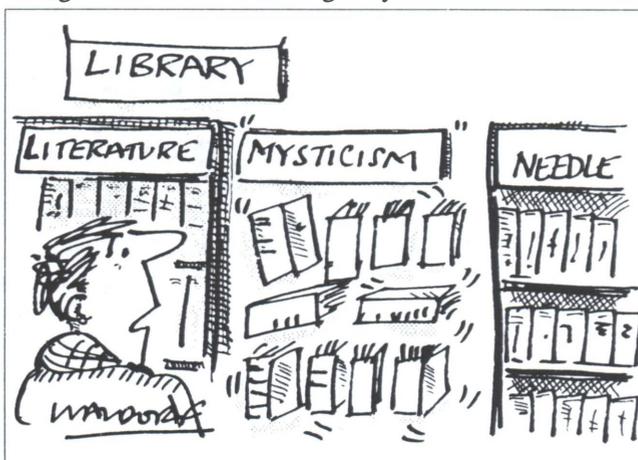
where a few leaders can dominate the outlook of all. I happen to favour an inferential basis for statistical mechanics that has been slow in appearing in textbooks, for example, and many physicists can come up with complaints about pigheaded referees. But it's not a picture of corruption, just slowness in moving; new ideas eventually diffuse throughout the field and find acceptance.

As an illustration, consider some of Emil Wolf's work, showing that the spectrum of a radiation source need not be observed to be the same from all vantage points. This was some fairly straightforward and interesting optical work. What got him involved in some minor controversy with astrophysicists is that such a mechanism can produce redshifts that are practically indistinguishable from one that would be the result of just speeding away from the observer. He doesn't think that this need threaten the expansion of the universe, but that didn't prevent some hostility, because this was 'obviously wrong'.

Burbidge charges that the Big Bang has become something of a faith as much as a theoretical framework, and that the climate of cosmology is such that no radical departures are tolerated, the subject being treated as closed. Worse, the peer review system is said to act as censorship, screening out obviously incorrect heresies without examination of merits. Even observation time is denied to workers that search for and find evidence against standard cosmology.

Lerner says much the same, observing that plasma cosmologists have been relegated to their own scientific ghetto, and ignored by the theoretical cosmology community. His more interesting contention is that cosmologists and their allies, the particle theorists, have effectively formed a Priesthood of High Theory, attempting to grasp the secrets of the universe by pure thought, making decisions based on elegance, beauty and symmetry. In the process, contact is lost with experimental reality. The motivations for the Big Bang are speculated to be primarily aesthetic and quasi-religious, rather than scientific.

The first Big Bang was the priest-physicist Lemaitre's 'primeval atom' theory. Ever since, as there seems to be this irresistible tendency to mix philosophy or metaphysics with physics, the Big Bang has been seen as a creation event. While some physicists like Hawking have pointed out that a finite space-time of current theory does not much correspond to a naive picture of creation *ex nihilo*, there is enough in it for the theologically inclined to work on.



Lerner also attempts to construct sociological reasons for why finite-history cosmologies would be attractive for twentieth century physicists, which are intriguing but far-fetched. Still, it is not totally implausible that non-empirical concerns have driven cosmology.

Related to this is the claim that the practice of cosmology and much of particle physics has gone wrong. Often, these areas of theoretical science are in a strange state, because of lack of experimental data, and the difficulty in obtaining it. So theorists tend to feed on each other, and problems tend to be more and more determined by theoretical considerations and a mathematical sense of aesthetics, rather than a need to explain real information. Lerner goes further and says that this situation is analogous to the ancient Greeks trying to solve everything by 'pure thought', like an insistence on circular orbits for the heavenly bodies because of geometrical elegance and perfection. Things have progressed to a degree that contradicting empirical information forces increasingly convoluted theoretical structures in order to preserve the glamour of the original vision. The theories become more and more difficult to understand, the property of an initiated few, and all but untestable practically. If you don't see dark matter, it has to be because you can't look hard enough—uncomfortably similar to saying that one has to have faith to be able to see the reality of psychic phenomena.

Lerner describes the attraction of the Big Bang in its explanation of the present in terms of a time when all was simpler, the forces were united; and then things blow apart, obscuring the essential unity of all, and instead of symmetry, lumpiness becomes the rule. But physicists sitting at their desks, writing down principles of symmetry, can reveal the beauty underlying our world of complication and sorrow. A Garden of Eden story in mathematical language, with priests interpreting constellations to produce the true theology.

Other physicists, such as plasma or condensed matter people, tend to have a less enthusiastic view of attempts to find the 'Theory of Everything', a re-run of the late 19th Century, when classical physics was thought to have a good chance to explain all and leave us the boring task of working out the details. We simply know too little, and a grandiose field that is not strongly constrained by observation like cosmology is likely to be subject to many changes—overconfidence is a real concern. An appreciation of complexity would do much to temper claims of getting to the bottom of it all.

Conclusions

Cosmology does seem to have some problems, and its practitioners might not always appreciate this. We may well have a case of metaphysics intruding on physics at hand. Yet I have difficulty in condemning a methodology that postulates fundamentals and tries to squeeze the most out of them. However obtained, the primary problem relating to theories has to be whether they are evaluated scientifically. Still, at the least, the 'fundamental physics' people suffer from an attitude problem, perhaps forgetting that science is supposed to be tentative *always*.

Overall, I would say that Big Bang cosmologies have

not exhausted their promise, and alternatives have as yet come up with too little in the way of detailed problem solving to become strong contenders. There is no comfort to be found for creationists, however, even in any possible crisis of the Big Bang. We can only note that the alternatives proposed both *extend* the age of the universe to an indefinite span, possibly infinity, and attack the very idea of a beginning.

Last, but not least, skeptics should not defend current science unconditionally while they attack pseudoscience; our position should also allow us to be effective critics of science. Cosmology may be providing us with an example of a legitimate science into which philosophical prejudices have intruded to the degree of constriction of our horizons, and where complaints of an unresponsive community have a (small) degree of merit. I'm fairly sure that cosmologists will eventually come through, whether by demonstrating that they'd been right all along, or by undergoing one of those minor scientific revolutions. But in any case, we have at hand a fascinating example of science in action, with all its imperfections and controversies.

Taner Edis is a graduate student in physics at the Johns Hopkins University. He manages the Internet electronic mail discussion group 'SKEPTIC'.

Crossword Solution

Our congratulations to Alfred Liddle, of Thurso, who is the winner of our Skepticus crossword competition in issue 7.4 of *The Skeptic*. We have made arrangements with the spirit of Charles Fort for a rain of books to fall upon Mr Liddle's house, one of which will be his prize of Joe Nickell's book *Missing Pieces*.

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Bob Basalla

A new angle on the prophecies of Nostradamus

ARE YOU TIRED of reading poorly written fringe speculation books, impenetrable pseudoscientific tomes, pamphlets with outrageous claims? Did you ever wonder how these authors research or fabricate the information presented in their volumes? Most of the time the skeptical reader contents himself with criticism of the finished product on the bookshelves. My suggestion is to approach the issue from another angle: make an attempt to learn how it's done by writing our own pseudoscientific work. A while ago I did just that in a newsletter I edit, the *Cleveland Chess Bulletin*. Here's how I went about it.

First I chose a text with which most of my readers would be familiar. Then I reinterpreted it. The prophecies of Nostradamus, translated, interpreted and reinterpreted for over four centuries, seemed an ideal choice for my purposes since I could collect them all from a single library source (*Nostradamus and his Prophecies* by Edgar Leoni, Bell Publishing Co., 1985). Also, the over 1000 four-line quatrains were sufficiently ambiguous to easily fall into my scheme.

All I needed was a subject to arbitrarily 'read into' and 'extract from' the quatrains (this seems to be the method of choice for many pseudoscience texts) and then to decide how far out my claims should be before selectively presenting the 'evidence' for my point of view. Since the publication I edit is about chess, the subject I chose was that game. In addition, the inherent implausibility of a link between the famous quatrains and the 'royal game' appealed to me as a challenge to my ingenuity. Here's what I did.

First I needed a plausible reason, if only as a veneer, in order to explain why Nostradamus's quatrains might elucidate the history of chess rather than the history of the world. I took as my model the proclamations of the 'Elvis-is-Alive' mongers. I derived my initial evidence from the subject's name. The 'Elvisers' almost always point out the fact that Elvis' middle name on his monument is misspelled therefore providing a clue that maybe 'HE' isn't buried there.

But what about Nostradamus? The name 'Nostradamus' comes from the Latin for 'Our Lady' which I interpreted as relating to a modern form of chess, the Chess of the Mad Queens, in which the queen has much greater powers than in previous incarnations of the game. In addition I concocted a theory in which all the quatrains, if properly ordered, can be placed on a sort of enlarged chessboard so that a knight can be hopped about, touching each

quatrains/square once and only once and that this knight's tour unravels the precise chronological order of Nostradamus' rather random verses.

The Knight's Tour Chronology is a perfect example of one of the chief techniques of pseudoscientific books: make up something which sounds impressive and superficially plausible but really means nothing. If you think about it, a one-way knight's tour can be represented as well in a linear fashion. And anyway the choice of which quatrain goes into which square is arbitrary. Now I was ready to tackle the quatrains in order to 'prove' my contention that the history of chess was on the 'prophet's' all-seeing mind. A few examples will suffice to give you the flavour of the resulting interpretations.

The greedy prelate, deceived by ambition,
He will come to reckon nothing too much for him:
He and his messengers completely trapped,
He who cut the wood sees all in reverse.

(*Century VI, Quatrain 93*)

Here Nostradamus tells the story of Game 1 of the 1972 Fischer/Spassky World Championship Match. Fischer tried to snatch Spassky's king rook pawn. The greedy bishop was soon trapped and captured and Fischer ('he who cut wood'—the composition of the chessman used in the match) went on to suffer a 'reverse', losing the game.

Because of the crystal the enterprise broken,
Games and feasts, a lion to repose no more:
No longer will he take his meal near the Great Ones,
Sudden catarrh blessed water to wash him.

(*Presages, Quatrain 78*)

A concise and detailed exposition of the first American World Chess Champion, Paul Morphy. Morphy's phenomenal success in the late 1850's and his triumphant return to America from Europe led to many lionizing banquets and gifts, hence the crystal reference. These gifts and the taint of professionalism they implied (which Morphy deplored) were clearly factors in Morphy's growing disaffection with the chess world ('enterprise broken'). As a result Morphy's life became more and more reclusive. He no longer played serious chess (taking his meal near the Great Ones). He finally came to a sad end by dying in his bath.

After the conflict by the eloquence of the wounded one
For a short time a false rest is contrived:
The great ones are not to be allowed deliverance at all.
The enemies are restored at the proper time

(*Century II, Quatrain 80*)

A commentary on the aborted first world championship match played in the mid 1980s between Anatoly Karpov and Gary Kasparov. The 'wounded one', an exhausted champion, Karpov, though still up 5 wins to 3, is given a series of illegal 'time outs' so that he can recuperate after a long string of draws and two badly botched games. In the end the match was halted and the two 'enemies' were restored to battle in a rescheduled match six months later.

After the see has been held seventeen years,
Five will change within the same period of time:
Then one will be elected at the same time,
One who will not be too comfortable to the Romans

(Century V, Quatrain 92)

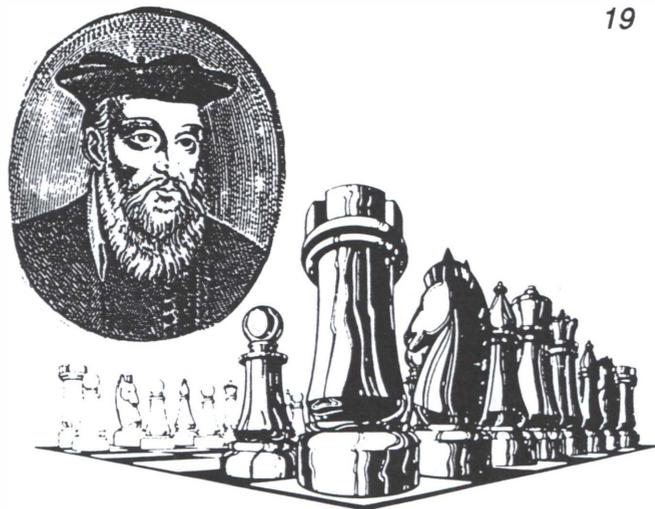
The five that change, of course, are the first players earning the appellation of Grand Master of Chess, bestowed on them by Czar Nicholas II at the St. Petersburg tournament of 1914: Laster, Capablanca, Alekhine, Tarrasch and Marshall. The year 1914 was exactly 17 years after Lasky began his tenure as undisputed world champion by defeating Wilhelm Steinitz in the latter's attempt at regaining the title of 1896. Note how I specify counting Lasker's reign as champion from his second match with Steinitz, not from 1894 when he first won it. This fudging allows me to make the 17 years line seem more accurate and lets me use the five line with its most appropriate chess connotation. Creative accounting like this can do wonders. The other thing to notice is that most of the detail resides in the purported explanation of the quatrains rather than in the quatrains themselves, an extremely common pseudoscience technique.

In addition to these full quatrain expositions I also interpreted one or two line segments by themselves, leaving the other (inconvenient) line of the quatrains off 'in the interests of space'. In this respect I am still being more honest than many previous Nostradamus interpreters who have plucked portions of several different quatrains and made them into a single whole in order to forge (in both senses of the word) their own meanings from hopelessly ambiguous lines.

Here are some techniques I learned that you may find useful when you write your own pseudoscientific book:

1. *Volume, volume, volume.* Reams of bewildering analysis impress by their bulk. My article in the *Cleveland Chess Bulletin* (of which the present article is a shortened version) referenced nearly 10% of the Nostradamus quatrains, about 100 in all. As a result many readers gave up before they waded their way through it and didn't even bother to examine all the claims thoroughly. So they had no idea if my later claims were accurate or not. Besides it looked impressive, and many of them probably mistook volume for scholarship.

2. *Choose a topic which is famous but not well read.* In this way your readers will find the material to be accessible but will still have to take your word for most of your conclusions unless they want to go through the tedious process of digging out confirmation of your claims (technique 1 comes in handy here too). Most pseudoscientific writers count on their readers not following up, and they are generally right so they rely on the fact that most people think that if they have heard about something or that its



name is familiar because they've seen it in print, it must be reputable.

3. *Use your credentials if you have them.* If you don't, make up some which seems plausible. Look at the number of preachers who have degrees from their own universities and who call themselves 'Dr.' and you will see what I mean. Degrees from unaccredited universities are a dime a dozen but that doesn't stop people from using them.

4. *Have fun with it.* I give you this advice only so that you will be able to keep your sanity while writing the stuff. I managed to sneak in all sorts of jokes, puns, crazy anagrams and even read English idioms into the French translation.

Now let's criticize my effort. The history of chess is probably not accessible enough for a general audience because the average reader may not know enough about it to give them the hook of plausibility although, since they have at least heard of the game (see technique 2 above) this might not be a real problem. Since I am considered an authority on the subject (see technique 3 above) this might even give my pseudoscience more credibility, but you should really choose your own area of expertise.

So how did my audience react? None of the readers of the *Cleveland Chess Bulletin* came out and said they actually believed that my article proved Nostradamus had predicted the history of chess. However, in spite of all the jokes and clues which I put in the article which suggested that this was satire a number of readers thought that I might actually believe it, and the fact that someone might take it even this seriously is illuminating in itself and justified, at least for me, my exercise in writing pseudoscience.

Who knows—maybe some day someone might find a copy of my article and proclaim me a psychic. The *Cleveland Chess Bulletin* is kept on file in the John G. White Collection of the Cleveland Public Library. Maybe I'd better write a retraction in a later edition.

Bob Basalla is editor of the *Cleveland Chess Bulletin*.

This article first appeared in Beacon, the journal of the South Shore Skeptics, based in Cleveland, USA. Copies of the full article, 'The Chess Prophecies of Nostradamus', are available upon request from the author, c/o PO Box 5083, Cleveland, OH 44101, USA.

Psychic Diary

Toby Howard

The Flixton Woodpecker

THERE ARE MANY TALES of extraordinary noises heard simultaneously by lots of reliable witnesses. Quite apart from the Eurovision Song Contest, Nature herself is capable of making quite an extraordinary racket: all over the world can be heard mysterious booms, shrieks, buzzes, hums, and crackles. Some are famous, such as the 'Barisal Guns' of the Ganges Delta which so intrigued William Corliss (see his article, page 6). Then there are *mistpouffers*, or 'fog guns', dull, explosive sounds heard all over the world especially near coastlines; 'lake guns' which boom around lakes, such as Lake Seneca in New York state; bangs in the sky; strange sounds thought to be of seismic origin, such as the 'Moodus noises' of Connecticut; unidentified hums; the alleged 'rustling' of the *Aurora Borealis*; the Yellowstone Lake whispers; musical sands; and so on, and on. I've never heard any of these myself, but I've often wondered if the reports may be somewhat exaggerated, especially if one thinks one is hearing something which is known to be 'mysterious'. But one day last week, I did hear something strange, and for a few hours I thought that there was one new mysterious phenomenon to be added to the list: the *Flixton Woodpecker*.

Flixton, unlike Yellowstone or the Ganges, is not a name to prompt instant recognition. I should say that Flixton, where I live, is about 4 miles west of Manchester, and is a small, fairly quiet, suburban area near the River Mersey and the Manchester Ship Canal. I'd like to tell you something that Flixton is famous for, such as a Megalithic Tomb, a haunted castle, UFO sightings or dinosaur tracks, but try as I might to unearth something interesting about the place, I've found nothing. Until now, that is.

On the day in question, I was woken by a knocking sound. It was in a rhythm of six, *BA-ba-ba-ba-ba-ba*, *BA-ba-ba-ba-ba-ba*, and sounded like knuckles rapping on wood. I lay in bed, listening on and off to the rapping, and how it syncopated with the ticking of the clock. The alarm went off, and I shouted something unprintable at it to shut it up. (I love these voice-controlled clocks; you can vent most of your day's spleen before you even get up.) It began to dawn on me that this tapping was something rather odd. My first thought was the gas central heating—our system often makes Fox Sisters-style knocking sounds for reasons best known to itself. But the sound today was different. The steadiness of the rhythm was the extraordinary thing. I opened the front door to see if anything was going on in the street. Nothing—it was dead quiet. Once back inside, the sound was there

again, still rigidly in rhythm. I went round the house from room to room, looking for something which might be causing it. Again nothing: it wasn't the central heating, the gas, the plumbing—the sound was *coming from the house itself*. This was getting spooky. If the noise had been in the street, as well as the house, it would make some sense, but there was none. I just couldn't believe this, so I went out again, and walked round the house listening for anything which might give me a clue as to what was going on. Stalking around, occasionally pressing my head against the bricks, I must have looked very suspicious, and quite mad. But I was scared—my house was throbbing with a mysterious noise! What was going on?

It was then that I noticed I had company. Up and down the street, there were people doing exactly the same as me, complete with bewildered expressions. I felt very relieved. Just then my neighbour drove up, and I went over to him. He'd been up early for work that day and had been through this paranoid activity several hours earlier than the rest of us. And on his way out he'd solved the mystery.

It turned out that in a nearby street, workers were underpinning the foundations of two houses, which had been undermined by the roots of two huge trees. They were hammer-drilling into the rock under the foundations of the houses, and it was this hammering which was travelling through the strata, and resonating in our houses. Apparently, the workers had sunk an 8" diameter tube 2 metres into the ground, and were now inserting into this tube a 6" diameter tube, to a depth of 9 metres. This tube was being driven down by a hammer at a rate of 10mm a minute. The work had been going on for days, but we had not heard anything because until now, the strata it had been passing through was relatively soft. But now they had hit a layer of very hard strata known as 'Fox Bench', which was 2–3" thick. It was the hammering on this hard layer that was resonating under the other houses in the vicinity.

So this was the explanation. Many of my neighbours, I subsequently learned, had been even more concerned than me. People had been very scared, and had called the Gas Board, the Police, and the local Council.

The next time I hear stories about people hearing strange noises, I don't think I'll be *quite* so skeptical. And that includes the Eurovision Song Contest.

Toby Howard is a lecturer in computer graphics at the University of Manchester.

Skeptic at Large

Wendy M Grossman

Modern superstitions

I HAD NO IDEA people thought superstition was dead until I talked to a woman from *The Time...The Place* who was having trouble finding people to admit, on television, that they were superstitious. I said I thought superstition persists, but has been modernized; the result is that people call it something else and don't make the connection. The specific beliefs have changed, but the habit of mind hasn't.

Like what? she said. Like...like...brand names, I said. Advertising companies spend millions to make us believe that there is a big difference between kinds of laundry detergents, or dishwashing liquids, or corn flakes. Or, as one friend put it, 'I'm a Ford man, always have been.'

The programme got cancelled, but in the meantime it annoyed me that I couldn't think of anything better. So I wandered into our skeptics conference on CIX (the Surbiton-based Compulink Information Exchange, an electronic conferencing system), and addressed the question generally to the assembled masses. The responses were interesting enough that I think it's worth mentioning some of them here.

DJ Walker-Morgan (dj) kicked things off with, 'Banging the side of a computer makes it work properly.' There was some discussion about this. 'But that does often shake up loose connections so they work,' John at GST Software (sproducts) pointed out, adding, 'Personally, I never put the lid back on a PC until I have proved that it works, because I know that unless you test it first it will always fail.'

John Diamond (johndiamond) weighed in with, 'An actor knows about toothpaste if he wears a lab coat in the ad.' When I added to this that it's also a common fallacy that actors who have played a character suffering from a social problem or disease are often then treated as experts about the condition, Tony Hollick (anduril) commented tangentially that at least actors do less damage than doctors.

Guy Kewney (guy) had a long list: 'If you wash the car it will rain. If I'm confident about my exam, I will fail. If you squeeze melons, you can tell whether they are ripe.' (Kewney eventually had to flesh this one out a bit: he contends that the only thing you can reliably tell about a melon by squeezing it is how often it's been squeezed before.) 'There's more beer in a glass with a head on it. Alcohol-based astringents are good for the skin after shaving. If a woman has large breasts she's interested in sex. You mustn't pick the phone up in between rings. It rains more often on Saturdays, and

the sun shines more often on Mondays. Spiders will chase people if they detect fear. A flea collar will kill fleas on a cat.' Finally, Kewney admitted to his own private superstition: 'I believe that computers can make you more productive.' Lucy Fisher added to Kewney's list: 'Cats always go for people who don't like them. Washing your hands in the water eggs have been boiled in gives you warts (or takes them away). Hot water freezes quicker than cold. Bad dress rehearsal, good performance.'

The hot water one is interesting, and several people jumped on it. 'Ah,' said Steve Cassidy (cassidys), 'hot water *does* freeze faster than cold. 'When this comes up I am always reminded of cold mornings as a lad, getting the ice off the car windscreen. I tried using a boiling kettleful of water once and once only; it steamed, it froze, faster than I would have thought possible'. But Andrew McClellan felt this idea had been quite clearly debunked. 'Aristotle wrote about it 2,300 years ago. There have been a number of papers showing it. McGee has shown that boiling water freezes in the same time as cold water. The theory is evaporation, leading to a smaller mass to freeze and the introduction of convection currents'.

I leave you with Phil McKerracher's suggestion of how superstition develops: 'Any time an appliance develops an intermittent fault, and some trial remedy seems to fix it (or even aggravate it), it will be superstitiously accepted by most people after only two or three trials.'

This reminds me of an experiment shown on TV some time ago concerning some birds who were trained to peck a lever to obtain food. This they learned quite easily, but the fun started when a randomizer was added so that the food was delivered unpredictably to them. The birds became obsessive, pecking at the lever continuously while a pile of uneaten food built up beside them. Cut to footage of a row of poker machines with people pulling the levers obsessively.

'Even more interesting, though, was that after a few weeks of this, the birds in the experiment developed superstitions about the best way to get the payoff. One bird would be putting its head under its wing, another would turn around each time it hit the lever, another hit the lever with a claw, etc., etc.'

Wendy Grossman is a member of the UK Skeptics, and a writer and folksinger. Her CompuServe ID is 70007,5537.



Reviews

The believer's tale

John Beloff, *Parapsychology: A Concise History* (Athlone Press, 1993, 330pp, pbk, £12.95)

As the title says, this is a concise history, describing the course of paranormal research since the days of Mesmer. On the way it covers the 19th Century fascination with Spiritualism, recent events such as the 'Geller effect', and research into psi communication in the ganzfeld. Each case is described, along with the names and findings of investigators. Notes and references to the original sources are included for anyone wanting to follow up a particular case in more detail.

However, the author makes it clear from the outset that he firmly believes that paranormal phenomena such as telepathy, psychokinesis and clairvoyance exist. In the book he suggests repeatedly that skeptics only object to reports of psi because of some hidden agenda, and so he ignores or belittles their contributions. The account of Ted Serios and 'thoughtography' is a case in point. Two reporters from *Popular Photography* visited Serios and his discoverer Eisenbud. They asked to inspect the 'gizmo' through which Serios would peer at the camera. Serios refused. After they left, Eisenbud persuaded Serios to let them see the gizmo. But, Beloff writes,

'[...] it was too late. By then his inquisitors declared that they were no longer interested. Yet however trivial the incident, it was all that Popular Photography needed [...].'

But if Serios and Eisenbud had later shown the reporters a plastic tube, how were they to know it was the same one? Beloff does not explain. Within the main text the skeptic's movement is almost ignored. Harry Houdini and James Randi each merit a mention. CSICOP is also mentioned as a rallying point for all those 'affronted' by psi. All other references to skeptics are relegated to the 'Notes' sections. Whenever Beloff does report a difference of opinion between a psi researcher and a skeptic, it is always the skeptic that has got it wrong. Beloff writes of the skeptics:

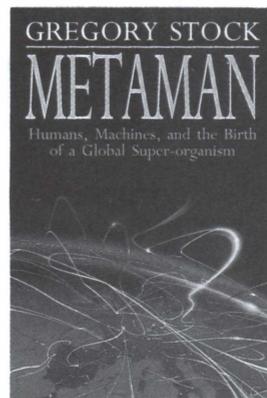
'They write with so much spleen and disdain and with such an air of superiority that one inevitably suspects that something more is at issue for them than just getting at the truth'.

I have to say that when Beloff does bother to mention skeptics in his book, he too tends to write with much spleen and disdain. But despite these faults this is a serious, well-researched book. It deserves a place on the bookshelf of anyone interested in paranormal phenomena.

—Paul Johnson

A new evolution

Gregory Stock, *Metaman: Humans, Machines, and the Birth of a Global Super-organism*, 320pp, 1993, hbk, £16.99



This book is well-written in a popular style, as you might expect from the author of *Sex and Love: The Book of Questions*. Futurology and millennialism are genres almost as lucrative as 'Scientists aren't as clever as they think they are' or 'Doctors? What do they know?'.

Gregory Stock's thesis is his subtitle: humans plus machines equal a global

superorganism. This is not the kind of statement you can prove or disprove—in fact he admits it is a metaphor—so how do you turn it into a big heavy book worth £16.99? This is how: you print it in large type on thick paper, and fill up with pictures of the warty frogfish, fascinating facts to be traded between saloon bar philosophers ('Did you know bats invented radar? Thanks, I don't mind if I do.'), and great clichés of our time. There are 14 Chapters, from 'Planetary Super-Organism' to 'A New Mythology', covering such things as robots, bionic men and human/animal hybrids. Illustrations include 'When Dinosaurs Reign'd', 'Maximum Extent of Glaciers', and 'Tail Fins of a Cadillac'.

Who is it aimed at? Little or no knowledge is assumed. It seems to be a response to the common fear that technology is inhuman, hostile and too powerful: '...some people fear technology might some day displace them entirely, or leave them with nothing to do...' It also provides uplift: 'This is a book about the nature of life ... the future of humankind', something many people are worried about, thanks to the decay of those 'old certainties' so often referred to and so seldom defined. But he defines them: once upon a time people thought the earth was in the centre of the universe, and man was made in the image of God, high up in the Great Chain of Being (they also thought they belonged to an Empire on which the sun never set and to a superior white race, but these particular 'old certainties' don't get aired quite so often). This cosy view was destroyed by Copernicus and Darwin. Are we progressing to a shining future (technology solves everything) or sliding into a swamp of degeneracy? He is of the 'bright future' school. He claims 'human specialness is *no illusion*' (his italics). Satellites are

Metaman's eyes, and *our* achievement (his italics). Commerce is like hormones (yes, and life is like a tin of sardines).

We are more than animals by virtue of our divine longings, but we are also part of the 'trajectory of civilisation'. The organisation of the world through technology is an evolutionary step for humankind, leading to who knows what wonders. But it's easy to say that wonderful things are about to happen, that our times are uniquely significant in human history. It gives people the idea that they have a role in determining their own future beyond the personal level. And they need do nothing about it—no tiring political lobbying, strikes or guerilla warfare. On the clichés grind: 'Metaman allows us to unite scientific and theological themes long considered incompatible.' 'Religious metaphors' must not be confused with 'literal truth'. Life is a miracle, but science is not emotionally or spiritually gripping enough. It lacks 'an explanation of *our* standing in the grand scheme' (his italics). His metaphor is designed to comfort the rocky ego that was pushed off its base by Copernicus et al. It has something to teach us about the American need for optimism and self-esteem. Its information would be useful to O-Level Geography students, and its conclusions to men in blazers living in Esher. ('Did you know evolution is accelerating? What's your poison?')

—Lucy Fisher

A meteoric mystery

Roy S Clarke (Editor), *The Port Orford, Oregon, Meteorite Mystery*, Smithsonian Institute Press, Washington DC 1993, pbk. Smithsonian Contributions to the Earth Sciences, number 31)

This monograph comprises two papers, 'John Evans and the Port Orford meteorite hoax', by Howard Plotkin and 'A mystery solved: the Port Orford meteorite is an Imilac specimen', by Vagn F Buchwald and Roy S Clarke. However, first an admission: before reading this report I had never heard of the Port Orford meteorite and after reading it I cannot understand why. It is a good plausible story; set in difficult but not inaccessible terrain; there are tantalising clues and a piece of the meteorite itself exists. So, why is there a mystery?

In 1856 John Evans, on behalf of the U.S. government, was exploring Oregon and writing reports on the geology of the state. Although he was not a qualified geologist most of his work seemed to be satisfactory and provided an adequate framework for later and more thorough surveys. He did not include it in his initial reports but Evans later claimed to have found a ten ton meteorite on the surface of one of the mountains he surveyed. He also produced a piece of rock he said he had chipped off the surface of the meteorite. There is no doubt that the specimen is meteoritic in origin. Evans tried to raise funds from the government to organise another expedition to retrieve the meteorite but just as he was starting to put together plans, two things happened. The American civil war started and Evans died.

After the war the geological reports and what was known of the meteorite were published. Prospectors moved into the area and private expeditions were organised to find the meteorite. Unfortunately the directions left by Evans were not specific enough and it has not been found in over a hundred years. The Smithsonian Institution has been answering questions from would-be meteorite hunters until, it seems, they get heartily sick of it and perhaps that also has something to do with the publication of his monograph.

The first part of the monograph is an historical investigation of Evans' work in Oregon. Plotkin shows that despite Evans' limited practical experience he was probably one of the best geologists available in Oregon at the time. He was, however, unable to manage the financial aspects of the work and finished the expeditions in debt. His personal fortunes also suffered from land speculations which did not work out. In short, he was in sore need of a large sum of money. According to Plotkin he hit on the meteorite idea to obtain more money from the U.S. government. The poor state of his reports allowed the inclusion at a late stage of the discovery in the guise of revision. Plotkin argues that he could have acquired part of a real meteorite from a Chilean source, the Imilac shower, while crossing the Panama isthmus on one of his journeys between Washington and Oregon.

Plotkin tried to find the meteorite following the directions given in Evans' reports and shows why this proved difficult. Geographical names had not been fixed at this time and there had been duplication of obvious names for similar features. A better map than the one printed here would have helped to show the problems encountered and a contemporary map could have been used to show what was known of the country in the 1850s to set the mystery in context.

Evans' specimen is a pallasite meteorite, a rare type, of which only three were known at the time. Obviously a ten ton example would be an amazing find well worth pursuing. Even now there are few more examples and Buchwald and Clarke make a good case for there being one fewer than thought. It's a matter of bad spelling.

Pallasites are unlikely to stay whole while falling and the larger the meteorite the less chance it has of staying in one piece. Ten tons is a very unlikely size. The main part of Buchwald and Clarke's report is a metallographic and mineralogical examination of the Port Orford specimen and several of the Imilac shower. Even though they all came from the same original meteorite the Imilac specimens show a variation of constituent compounds. The composition of the Port Orford meteorite is broadly similar to the Imilac results. In the absence of any proof of an actual meteorite in Oregon the most likely origin of the specimen is the Imilac shower.

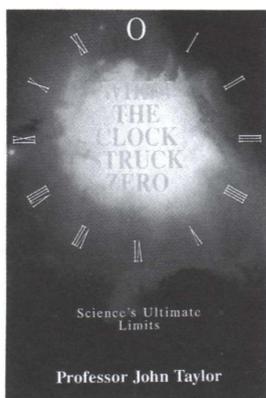
The likelihood is that the Port Orford meteorite does not exist. Whether Evans would have succeeded in his fraud and how he could have explained losing his meteorite are matters for speculation. Other explorers find reasons for not finding what they seek. Unlikely objects and animals have their believers but only rarely is the belief justified. Between them Plotkin, Buchwald and Clarke should

have killed the Port Orford meteorite but I suspect that it will remain the quarry of searches for years to come and the Smithsonian will still be pestered for details.

—Ernest Jackson

Looking for a TOE

John Taylor, *When the Clock Struck Zero: Science's Ultimate Limits* (Picador, 1993, 211pp, hbk, £15.99)



Professor John Taylor has joined the expanding group of physicists and mathematicians who have written books which discuss fundamental questions of existence in an untechnical manner. His latest book shares much thematically with the books of Stephen Hawking (*A Brief History of Time*, Bantam Press 1988) and Roger Penrose (*The Emperor's New*

Mind, OUP, 1989). Indeed the first half of his book may be considered as a reply to some of the issues raised in *A Brief History of Time* and the second half offers an alternative explanation to the theory of consciousness discussed in *The Emperor's New Mind*. This leads us to the only major problem with this book: it's too short! In its 211 pages John Taylor considers the following questions: How was the Universe created? Why is that 'Theory Of Everything' (TOE) the particular one? How can we explain consciousness? Why is there something rather than nothing?

In order to fit this into such a limited space Professor Taylor has had to sacrifice many of the details of his ideas. On several occasions I wanted to know more. One of John Taylor's suggestions is that:

...there is no ultimate TOE, but only a sequence of scientific theories to explain the Universe, reaching ever greater precision. Each theory displaces the one before it and answers the 'how' question about that displaced theory; the new theory will have greater explanatory power to allow it to fit the facts which were recalcitrant for the preceding discarded theory.

Thus he is proposing an infinite chain of theories. Each theory in the chain will have a range of validity. For example it may only apply when the velocities of bodies are low (Newtonian mechanics). As the situation becomes more extreme (velocities become larger) the suitability of this theory decreases and its ability to fit observations disappears and instead we should use the next theory above (or below) in the chain (special relativity). This certainly seems to match the historical development of physics and ensures that physicists will never become redundant. He goes on to explain how this metatheory answers (or reduces to non-sense) some of the questions listed earlier.

There are problems with this idea—the only way to falsify it is to find a TOE. Thus if we fail to find a TOE and instead just find a (necessarily finite) list of theories of

limited applicability we cannot be sure that there does not exist a TOE; we may just be too stupid! In addition even if there is this infinite chain of theories why can we not try to construct from this chain an overlaying metatheory which is applicable in all situations. Clearly this idea is not well defined and probably misconceived but such questions are not considered by John Taylor.

In the second half of the book Professor Taylor offers a scientific explanation of what consciousness may be. Having little knowledge of neurological processes I cannot comment on the accuracy of his argument but his explanations of the known workings of the brain and his extension to these certainly seem plausible. His conclusion is that self-awareness is a natural consequence of the physical activity of the brain and that there is no necessity to consider the mind as a spiritual entity possessing little physical reality. This part of the book is only marred by one (of the two) diagrams being very murky and difficult to see. It may have been better to omit it.

The book was very interesting and contains some intriguing ideas. The writing is usually clear and despite a tendency towards the purple it is a pleasure to read. My only real criticism is the length—another 100 pages would have enabled John Taylor to more fully develop his ideas. The book is worth reading for the section on consciousness alone.

—Toby O'Neil

The secrets of the scrolls

Robert H Eisenman and Michael Wise, *The Dead Sea Scrolls Uncovered: Fifty Previously Unpublished Scrolls from the Qumran Collection* (Element, 1992, 286pp, hbk, £14.95)

A most extraordinary episode in Biblical archaeology began in 1947 with the discovery in caves near the Dead Sea of a library of scrolls assembled nearly two thousand years ago. An 'International Team' of scholars translated and interpreted the scrolls under the control of a series of editors, all connected with the Dominican order in Jerusalem. Publication was selective and access to the original documents jealously guarded. The editing dragged out interminably. After the Six Day War in 1967 the Israelis took over archives in East Jerusalem but the authorities were still not spurred to greater openness for some twenty years.

Accusations of professional incompetence, and political and religious bias abounded. Bizarre theories appeared: John Allegro linked early Christianity with the use of hallucinogenic mushrooms. More recently, Jesus has been identified in some writings as the Wicked Priest, a divorced and remarried father of four. (I am reminded of the Monty Python sketch about Michelangelo's Last Supper ... Twenty eight apostles, a kangaroo and *three* Christs?) Eisenman himself pursues a line of conjecture which is strongly disputed by the Oxford University Centre for Qumran Research. What is important to a sceptical reader is that the

source material should be unrestricted.

Eisenman, an historian, came to Jerusalem in 1985. He was given little cooperation when it came to seeing the Scrolls themselves and was firmly told by the Antiquities Department: 'You will not see the Scrolls in your lifetime'. (Unknown to him then, there existed a complete photographic archive of the original Qumran material at the Huntington library in California, not far from his own university at Long Beach. Astonishingly, the existence of this collection was not widely known, even among staff at the library itself.)

But things were now already happening, and with unaccustomed speed. Photographs of the remaining Qumran scrolls were 'made available' to Eisenman. It is not clear by whom, but the establishment hold was clearly slipping. By 1990 he had received the whole of the unpublished body of Qumran writings, some 1800 photographs. He worked with Wise from the University of Chicago, going through everything, 'to see what was there, however long it took, leaving nothing to chance and *depending on no-one else's work*'.

Their first publication was a facsimile edition. Ten days before its scheduled release in 1991, after pressure was applied by the International Team, the publisher inexplicably withdrew. The day was saved by the Biblical Archaeology Society of Washington.

Why is there such bitterness and controversy surrounding this story? A good part must be due to academic rivalry. The temptation to monopolise a unique historical find must have been difficult to resist. No one could work without access to the documents. The curators only looked kindly on those scholars who conformed to their school of thought. Good research, challenged by disputation, was stifled. Secondly, the very nature of the Scrolls is both intriguing and potentially embarrassing to some Christian authorities. The writings belonged to (but were not necessarily written by) a community of Jews living very shortly after Christ. They may have been a Messianic sect, Essenes or Zealots or Sadducees. What is most important is whether they were Jewish *Christians*. Did the religion which has since shaped half the world really look like this in AD50?

Most of the book is a translation of the Scrolls, with commentary. They are a glimpse of the past, of someone else's bookshelves. The fact that they have now survived uncensored for nearly two millennia adds to their fascination, even for an atheist.

—Chris Nash

Light at the end of the tunnel?

Susan Blackmore, *Dying to Live: Science and the Near-Death Experience* (HarperCollins, 1993, 291pp, pbk, £6.99)

The possibility of life after death continues to fascinate. Recent research into postmortem survival has tended to concentrate on so-called 'Near-Death Experiences' (NDEs)—visions sometimes reported by individuals who have been at one time medically close to death. The contents of such visions vary from case to case but can include experiences of being out of the body (OBEs), of moving through a tunnel towards a light, of meeting deceased relatives, of feelings of joy, and of a sense of timelessness.

The most common explanation for such experiences is that they represent the entry of a dying person's spirit into another world. But in this new book, Susan Blackmore offers a robustly naturalistic explanation of such phenomena: the visions are hallucinations produced by the dying brain. Thus, for example, the appearance of a tunnel can be explained in terms of the change in activity of the visual cortex, the feelings of joy are the result of the brain's secretion of endorphins, and so on. However reductionistic this approach may seem, the aim is to provide a genuine understanding of such experiences rather than simply to 'explain them away' and to this end Blackmore gives quite detailed accounts of how these experiences might be produced.

The second half of the book is more philosophical in character. Pointing to the evidence provided by visual illusions, Blackmore argues that perception is a constructive process in which the brain actively builds hypotheses about the world and so forms some sort of representation or 'mental model' of it. Indeed, at times she even seems to be suggesting that reality is nothing more than a mental model and that this means the world is somehow all an illusion. To me it would seem more natural to assume that our model of the world owes its usefulness precisely to the fact that it succeeds in mapping more-or-less faithfully at least some features of a very real external world.

Either way, it is to the notion of 'mental models' (of the world and of the self) that Blackmore appeals in order to explain various aspects of the NDE. In the state close to death, the brain constructs the best model of the world that it can on the basis of the limited amount of sensory information available to it. Blackmore tries to show how this might lead to the subjective experience of OBEs and of other features of the NDE and why in spite of their illusory character such experiences nevertheless feel very 'real' to the individual concerned. Are such experiences therefore totally without spiritual significance? Blackmore insists that this is not so. She argues that an individual's 'self' (their sense of being an 'I') is only a mental construct with nothing substantial underlying it and that the sense of timelessness associated with some NDEs arises through the breaking-down of this mental model of the self. This leads Blackmore to adopt a position very similar to that of Buddhism (though of course minus the associated doctrines of karma and rebirth). Moreover, it is a position that offers some solace in the face of death—death need not be feared

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because there is literally no-one there to die!

Blackmore offers an account of NDEs that is likely to appeal to those of us who find the whole idea of an afterlife difficult to accept (however attractive it may be). I found her arguments to be in most respects plausible, though our meagre understanding of the brain inevitably means that many of her explanations, are as yet still too schematic to be wholly convincing.

—Tim Axon

Events

The 5th European Skeptics Conference, Keele University, 29–31 August 1993.

The 5th European Skeptics Conference, organised by the UK Skeptics, was held as part of the annual science festival of the British Association for the Advancement of Science, and led off the event on the evening of Sunday 29 August. In fact the Skeptics jumped the gun: while the festival was still being officially opened by a display of fireworks over the lake, Dr Peter May was already well launched into 'Faith Healing Claims of Morris Cerullo—a follow-up and critique'.

During the previous week, many of us had become used to the large billboards advertising Cerullo's latest healfest: 'Miracles are impossible. You decide'. Dr May, a GP from Southampton, had tried long and hard to make that decision by making a proper assessment of the results. This included the ultimate tactic of urging Cerullo to make his own choice of the best cases. But medical follow-ups were all too often refused, and there was continued obstruction and lack of cooperation. The often-heard claim that at least faith healing does no harm was spiked by such examples as the woman who was persuaded to stop taking her drugs against epilepsy: six days later, she had a fit in the bath and drowned.

The second day began with critiques of alternative medicine. The morning session was opened by Dr John Maddox, the editor of *Nature*, who trained his sights on homeopathy. He recounted strongly-felt memories of his own second child being lost because a locum prescribed for his pregnant wife what turned out to be a homeopathic powder—useless for the diabetes that was eventually diagnosed. He also reminded us of the Benveniste affair, with its claims that homeopathy had at last been put on a scientific footing. Maddox's final verdict on homeopathy: 'It is a scam, it undermines science and its public reputation. It is a pastiche of regular science, so regular science is debased ... I feel strongly about this. One cannot be polite about it. One should not be polite about it'.

Dr Jan Willem Nienhuys, who teaches mathematics at Eindhoven University, enlightened us on the subject of Electro-Acupuncture according to Voll (EAV), and Dr Willem Betz talked on 'The Use of Fraud in Health Care'. He was critical of the notion of assessing remedies in terms of patient satisfaction: 'Why not ask smokers about their satisfaction with cigarettes, and then put cigarettes on the

National Health Service?'

Clinical psychologist Michael Heap had given thought to the question: 'How Can Useless Therapies Survive?'. He saw the treatment situation as a reciprocal agreement between patient and therapist, and he floated the proposition: the purpose of therapy is to authenticate the therapist.

The medical writer Caroline Richmond presented a critique of the Homeopathy Hay Fever Trial, published in *The Lancet* in 1986. The author of this study, Dr David Taylor Reilly, was present in the audience and raised objections. It was agreed on the spot that space would be found in the next day's schedule to allow him to present his case.

Dr Thurstin Brewin, an oncologist, now with the 'HealthWatch' organisation, spoke on 'What's Wrong with Alternative Medicine'. He flourished a copy of the British Medical Association's latest 'report' on fringe treatments. It tabulates every fringe medicine uncritically, and is satisfied with the criterion of 'proper training'. Being properly trained in nonsense still leaves you with nonsense: 'Why not treat patients with voodoo, as long as you're properly trained in it?', asked Dr Brewin.

The afternoon session turned to 'The Philosophy and Psychology of Paranormal Belief'. Professor Antony Flew wasn't able to make it to the conference, so the keynote address was delivered at short notice by Professor Robert Morris, who occupies the Koestler Chair of Parapsychology in Edinburgh. He provided a brief taxonomy of possible deceptions in claims to ESP ('Error Some Place?'). Psychologist Dr Susan Blackmore then recapped the claims made for the 'Near Death Experience', and the slim evidence for out-of-body phenomena. There are no validated cases of unconscious patients possessing information not available to them by normal means.

Dr John Gillies, a psychologist at the University of Glasgow, gave a skeptical view of the belief in Multiple Personality Disorder. And Dr Chris French, a psychologist at the University of London, asked: 'Do Sheep and Goats Process Information Differently?' Believing sheep, it turned out, were poorer than skeptical goats at probability estimation (useful for such things as assessing dream coincidences).

On the final day, some talks ran concurrently, and being confined to in-body experiences, I can only report on those I was able to attend. Mike Howgate, a palaeontologist, took as his theme 'Pseudoscience and Antiscience in Jurassic Park'. Next, the physicist Dr Robin Allen gave us inside information on the making of crop circles, and demonstrated the simple wood-and-rope 'stomper' that could account for so many complex formations in such a surprisingly short space of time.

Throughout, we had the pleasure of the company and support of two welcome visitors from CSICOP in the United States: Tom Flynn, who presented a video produced by CSICOP, and Professor Paul Kurtz, who gave a talk on 'The Growth of Anti-Science'. The good news is that skepticism is far from being on the retreat. Professor Kurtz calculated that there are now 54 skeptical newsletters and magazines worldwide.

—Lewis Jones



Letters

Typography and Burt

I have sent Ray Ward (Letters, *The Skeptic*, 7.4) duplicates of the offprints I sent to him earlier. It is a pity he did not receive them. They might have saved him a couple of incautious statements.

'While he was psychologist to the LCC, [Burt] and the medical research officer carried out some tests' on the effect of printing on reading. The original test reports are lost, but Burt tells us: 'In our own early experiments Dr Kerr and I found almost at once that, for word recognition, a sans serif type face was the worst of all'. Burt refers to Kerr's *Fundamentals of School Health* (1926), but Kerr's ponderous tome makes no mention of any tests of legibility carried out at the LCC (or indeed of Burt). Kerr does, however, refer without comment to an American study in which a sans-serif type to be the most legible of those tested.

Ray Ward remarks that Burt's two co-authors, of the 'Study of Typography' in *British Journal of Statistical Psychology*, 'would presumably have had to be in on any deception'. Alternatively they may have been part of the deception, for there is no independent evidence of their existence. When the same paper appeared in book form, their names were dropped. Burt says in the preface, 'the paper has undergone considerable revision and expansion, and for its present form I alone am responsible'; but in fact the revisions and expansions are negligible. I have heard it suggested that the names were dropped because royalties on the book would have been due to all the authors, and you cannot pay royalties to fictitious persons.

There was good reason for Burt to study typography in 1955. His friend, the eminent typographer Beatrice Warde, was providing a subsidy for *British Journal of Statistical Psychology* so that he

could continue as editor. As Ray Ward says, it was not his main field, and he had no particular motive to falsify results there.

Presumably, then, his work in this field shows his *habitual* way of working, when he had no particular axe to grind. A study of this work may therefore cast light on the validity of his work in general.

Donald Room
London

Meditations

Oh, dear. My little letter on meditation (*The Skeptic*, 7.3) seems to have given Arthur Chappell ('It's all in the mind', *The Skeptic*, 7.4) an attack of the paranormals (laced with sarcasm?).

For instance, he claims my letter appeared in issue 7.2—before it was written. Then he demands to know who defined some thoughts as 'obsessional'. As I'd already noted (lines 21 and 22) that it was a medical relative, it seems that a passing crop circle must have expunged those lines from Mr Chappell's copy of *The Skeptic*? (Maybe it was Sprite.) I am also informed that maybe I had a guru. As a scientific type, I was conducting an experiment. (Did Faraday have a guru?) Not content with that, Mr Chappell tries clairvoyance. I said no money changed hands—but he thinks it did. (I came across some Yoga books on an Indian friend's bookshelves He generously gave them to me. He wasn't a guru, but an engineer.)

Finally, I was not surprised at experiencing some difficulty at first, nor did it make me join a Yoga group. The book I consulted warned me that I might have difficulty. And I did. because like most people, I was a bit stressed. Which is why I found it hard to concentrate on not concentrating. After three weeks, I felt much less stressed. So did my pre-

frontals.

Try it some time, chaps and lasses. Then criticise it. Maybe.
Yours mit Schadenfreude,

John Clarke
Uxbridge

Defending Blavatsky

The reviewer of *Madame Blavatsky's Baboon* (*The Skeptic*, 7.4), appears to be licking at crumbs that fall from the Master's table.

Plagiarising Darwin, although his great-great-great-grandfather may have been an ape, strutted around in fine linen and a top hat. Today, his theories are in tatters, exploded not only by theorists and fundamentalists, but also by the pundits of science.

Iconoclastic Blavatsky's Theosophical Society is alive and flourishing and her erudite postulations in her monumental *Isis Unveiled* and *The Secret Doctrine* (still in print) have never been adequately refuted by Neanderthal types or Homo Sapiens. Poor Krishnamurti, having been cremated and reincarnated, cannot turn in his grave.

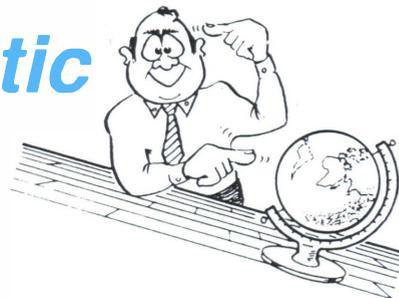
Who would dare cast a stone at Annie Besant's magnificent career, not only in the Black Hole of Calcutta, but throughout all of India. Certainly not Mother Theresa, but perhaps people who live in glass mausoleums. Let us render to Blavatsky the things which are the Masters', and to Professor Fiske, not a hand, but a Baboon's paw.

Cecil R Keys
London

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