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ASSOCIATION for SKEPTICAL ENQUIRY

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WRITING FOR THE SKEPTICAL INTELLIGENCER: GUIDELINES FOR CONTRIBUTORS

The Skeptical Intelligencer welcomes contributions on any subject within the ambit of the Association for Skeptical Enquiry (ASKE). Articles should in general be aimed at the intelligent layperson, and authors should take particular care to define or explain unusual terms or concepts. Equations, statistics or other numerical and symbolic tools may be employed whenever required. Articles should be as succinct as possible, but may be of any length.

All submitted texts will be critically reviewed by either the editorial team or specialists within or without ASKE. In particular, all material intended to represent a substantive contribution to the literature will be peer-reviewed by experts in the field concerned. Where improvements or changes are desirable, the editorial team will work with authors and make constructive suggestions as to amendments. The right to refuse publication is reserved.

The Skeptical Intelligencer welcomes letters from readers. Comments, suggestions, praise or criticism (whether of the magazine or any material it publishes) are greatly appreciated. Please indicate clearly that a letter is intended for publication.

Whenever possible, authors should submit a printed, double-spaced, hard copy of their article or letter, together with a hard disc containing the text in text-only or MS-Word format, to the address shown on the front cover. Alternatively, contributions may be sent by e-mail to the editor at <aske@doofa.demon.co.uk>.

When referring to another work, authors should:

- cite only the surname, year, and (where appropriate) page number within the main text: e.g. "...according to Hyman (1985: 123), the results of this test were not convincing..." or "...according to Bruton (1886; cited in Ross 1996)...".

- list multiple references in date order: e.g. "...a number of studies have thrown doubt on this claim (Zack 1986, Al-Issa 1989, Erikson 1997)..."
- where the reference is to a citation or summary of a work and not the work itself, provide references to both: e.g. "...early results suggested this was not the case (Clivager 1888, summarised in Ramala 1976)..."
- in the case of electronic material, give the author and the date the material was accessed on line
- place Internet addresses in angle brackets: e.g. <http://www.nothing.org>

A complete list of references in alphabetical order of authors' surnames should be given at the end of the article. The list should be compiled using the following conventions:

- Articles: Smith, L.J. 1990. An examination of astrology. *Astrological Journal* 13(4): 132-96
- Books: Naranjo, X. 1902. *The End of the Road*. London: University of London
- Chapters: Griff, P. 1978. Creationism. In D. Greengage (ed). *Pseudoscience*. Boston: Chapman Publishers
- Electronic material: Driscoe, E. *Another look at Uri Geller*. <http://www.etc.org>. Accessed 21 April 1997.

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EDITORIAL

ASKE and religion

By Wayne Spencer

In this issue we present twinned articles on contemporary relativist philosophy and the alternative medical technique called Therapeutic Touch. We also have a special section on religion and skepticism made up of a book review and three articles .

What is the proper relationship between the skepticism evinced by ASKE and religion? In his contribution to this issue Doug Bramwell reviews a new book that analyses the philosophical arguments for and against the proposition that God exists. Are such arguments appropriate material for the magazine of ASKE? In general, skeptical organisations in other countries have followed the lead of the American-based Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) and largely restricted their view to claims that are amenable to empirical scientific examination. Is this the line that ASKE should pursue?

One reason for skeptical groups declining to venture into the philosophical dispute regarding the existence of God is pragmatic in nature (Kurtz 1992: 347-352). In the United States something like 90% of the population purport to believe in God (see, for example, Goldhaber Research Associates 1996), and it appears that a considerable proportion of scientists are religious believers (see Beit-Hallahmi and Argyle 1997: 180ff; Larson and Witham 1997). In consequence, any organisation that challenges or questions religious belief may well find itself condemned to a marginal position from which it will do little to promote critical thinking on any subject. However, is it the case that such pragmatic concerns are equally relevant in the United Kingdom? According to most measures, this country is considerable

less religious than the United States (Bruce 1995, 1996). Does this mean that a popular base exists for an association that is prepared to examine all aspects of religion in a critical spirit? Or does the small size and apparently limited influence of the various British humanist bodies suggest that the public has very little appetite for a rationalist approach to religion?

In his article in this issue Michael Heap does not seem entirely to rule out the application of the tenets of skeptical enquiry to religious claims considered to transcend the empirical, but he ultimately suggests that religious belief can be married with science and skepticism. This notion would appear to be widely held amongst skeptics and others. But does it stand up to examination? Recently, Mahner and Bunge (1996a and 1996b) have argued at length that science is fundamentally incompatible with religion at the doctrinal, metaphysical, methodological and attitudinal level, and some of the arguments they advanced are repeated in the article by Bunge that appears in this issue of *The Skeptical Intelligencer*. What are we to make of this difference of opinion? Can it properly be argued that science deals with the natural and religion with the transcendental and supernatural, and hence there is no overlap between them? Does science investigate the proximate and religion the ultimate causes or grounds of empirical processes and objects". Is the notion of an ultimate cause or ground meaningful? How could one discern the difference between something that had an ultimate cause or ground and one that did not? What is added to a scientific explanation by a religious explanation? On what grounds can one properly conclude

that a transcendental realm exists? Does the fact that science presupposes only natural processes mean that science and religion are incompatible? Are the naturalistic presuppositions of science only made for methodological purposes and do they carry no ontological implications? Why are these presuppositions made? Why are they so successful? Is there a straightforward incompatibility between the assumptions and hypotheses of the scientific fields (such as sociology, psychology and anthropology) that study religion itself and the explanations for the origin and nature of religious systems, belief and experience held by religious believers? Are these and similar questions at all relevant to ASKE?

One aspect of religion that may be a cause for reflection on the part of skeptics is its appeal to faith. It appears to be uncontroversial that at the root of skepticism is a commitment to critical thinking. Is the view that faith is a proper basis for belief in the realm of religion inconsistent with this? Can a justification for reliance on faith in religion be developed that does not involve special pleading and vicious ad hoc propositions? Interestingly, Martin Gardner, a man whose work (e.g. Gardner 1957) appears to have influenced many in the skeptical movement, has arrived at a belief in a deity through an "emotional leap of faith" (Gardner 1983, 1997). If we follow Siegel (1997: 35-6) and accept that critical thinking:

"...includes dispositions, for example the dispositions to seek reasons and evidence in making judgements and to evaluate such reasons carefully in accordance with relevant principles of reason assessment; attitudes, including a respect for the importance of reasoned judgement and for truth, and a rejection of partiality, arbitrariness, special pleading, wishful thinking, and other obstacles to the proper exercise of reason assessment and reasoned judgement; habits of mind consonant with these dispositions and attitudes, such as habits of reason seeking and evaluating, of engaging in due consideration of principles of reason assessment, of subjecting proffered reasons to critical scrutiny, and of engaging in the fair-

-minded and non-self-interested consideration of such reasons; and character traits consonant with all of this"

must we then conclude that Gardner is not at bottom a critical thinker and skeptic? Does it matter? And what about findings which show that believers tend to accept invalid syllogisms with a pro-religious conclusion (Feather 1964), and strengthen their religious beliefs when confronted with disconfirmatory evidence (Batson 1975). Are these of no interest or concern to members of an association which seeks to promote critical thinking?

Even if one is of the view that transcendental religious beliefs are not appropriate matters for ASKE, the question will arise whether religious beliefs encourage paranormal claims of the type in which ASKE is undoubtedly interested. Clearly, "scientific creationism" is a product of a religious belief in the inerrancy of the Bible, while belief in miracles and angelic visitations are probably partly rooted in prior religious commitments and ideas. But what about astrology, ESP and other non-religious paranormal beliefs? Studies examining the correlations between these beliefs and religiosity have produced rather mixed results (see Irwin 1993 for a review). However, a survey by Bainbridge and Stark (1980) found that born-again Christians had consistently lower levels of belief in such non-religious paranormal claims than respondents with no religion. Furthermore, Taylor, Eve and Harold (1995) found evidence of two largely separate categories of pseudoscientific belief, one made up of various fantastic science beliefs (e.g. belief in the Loch Ness Monster and visits by extraterrestrials) and another connected with creationist religious belief and another made up of various fantastic science (see also Irwin (1993: 4) for a discussion of other studies that suggest that paranormal belief is multidimensional). Overall, it would seem that certain religious positions may dispose believers to believe in some paranormal claims and disbelieve in some others.(see also Irwin (1993: 4) for a discussion of other studies that suggest that paranormal belief is multidimensional).

But perhaps the connection between religious and non-religious paranormal claims is indirect. Lett (1992) has suggested that the social acceptance of

unfounded religious beliefs fosters the view that non-rational appraisal of other claims is legitimate. The hypothesis is an interesting one. Unfortunately, it would seem that evidence for or against it is currently lacking.

Whatever the best answers may be to the various questions posed above, the aims and principles of ASKE make no reference to religion as such and the Steering Committee takes the view that the purview of the association should not extend to merely transcendental religious claims. In making this decision, we are not affirming or denying that the principles of skeptical enquiry apply to such theological claims. Rather we are suggesting that the appropriate places for discussion of these matters are the many journals and organisations that specialise in them. That said, I would suggest that it is not always easy to know where to draw the line. Consider, for instance, the article in this issue by Keith Alexander. Perhaps many of the members of ASKE would agree that we should be looking at so-called near-death experiences and claims of reincarnation, but what about immortality or survival of death in general? Should discussions of the latter not even appear in critical appraisals of the former?

I would also point out that not every skeptical organisation shares ASKE's approach. Recently, *Skeptic*, the magazine of the Skeptics Society of Altadena, California, has published a number of articles that directly challenge arguments that purport to support the existence of a deity. As some 70.9% of the members of the Skeptics Society are evidently atheists or agnostics (Skeptic 1995), this new direction may have some support. However it is not wholly without its risks. Thus, when Skeptic published a special issue on *The God Question*, Dr, Laura Schlessinger, a nationally-syndicated talk show host, promptly resigned from Skeptic's Board of Advisors, saying:

"When man's limited intellect has the arrogance to pretend an ability to analyze God, it's time for me to get off that train" (Shermer 1997)

The Skeptics Society commented:

"The Skeptics Society finds this attitude - all too popular even among highly educated Americans - appalling! We find it is the height of arrogance for anyone to think that they have discovered the one true religious belief or the one absolute basis for morality.

Rather, we at the Skeptics Society want to undertake new research into the questions of God and religion and whether morality and ethical systems can be based on human reason rather than religious faith. And we think that this can be done while honoring the words of Baruch Spinoza that we have taken as our motto:

"I have made a ceaseless effort not to ridicule, not to bewail, not to scorn human actions, but to understand them." (Shermer 1997)

It will be interesting to see where this new direction leads and what influence it has on skeptical organisations world-wide

* * * *

The Skeptical Intelligencer proposes to add two new regular features. The first is a news column dealing with developments or events (whether serious or humorous) that may be of interest to the members of ASKE. The second is a list of new articles and books pertinent to ASKE's concerns. If these proposed columns are to flourish, we need readers to send us cuttings from journals, newspapers and internet sites, and details of new publications. We should be grateful, therefore, if you would keep your eyes open and your scissors at the ready. Please send all material to the editor.

* * * *

I am pleased to announce that *The Skeptical Intelligencer* now has a third assistant editor: Mark O'Leary. I should like to thank Mark for accepting our invitation to join the editorial team. His assistance will, I am sure, be invaluable.

* * * *

To our great regret, Mark Gould has recently informed us that his health no longer permits him to assist

in the production of *The Skeptical Intelligencer*. Mark put many hours of his time into the last two issues of the magazine, and without him those issues may well not have appeared. We thank him for his invaluable assistance in the past and hope that his health improves in the future.

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NEWS

North American Health Claim Surf Day

By Charles P. L. Stewart

Charles P.L. Stewart Bsc (Hons) graduated from Durham University/University College Stockton with a degree in Health and Human Sciences. He is currently studying for a post graduate diploma in Psychology at Sunderland University.

On September 29 and 30 1997 the Federal Trade Commission (FTC) joined forces with representatives from state organisations, health care associations, and information groups from America, Canada and Mexico to 'surf' the internet. The aim of the Health Claim Surf Day was to highlight unfounded or deceptive internet advertising claims relating to six diseases: AIDS, cancer, diabetes, heart disease, arthritis and multiple sclerosis. The FTC are concerned that a number of www sites and Usenet newsgroups seem to be making fervent and unrestricted claims, promising 'miracle cures' for one or more of these diseases. According to Jodie Bernstein, Director of the FTC's Bureau of Consumer Protection:

"Hopeful and sometimes desperate consumers spend millions of dollars on unproven, and often useless 'miracle cures'; and the internet should not become the newest medium for this age-old problem".

The FTC also warned that unsubstantiated treatments or health products advertised on the internet are liable to exacerbate a patient's condition. These concerns were shared by the Arthritis Foundation Senior Vice President, Medical Affairs, Doyt Conn MD:

"With 40 million Americans coping with the daily pain and limitations arthritis can bring, marketing of unproven arthritis remedies is an ongoing concern".

Chair of the Board of the American Diabetes Association, Stephen J. Satalino also has reservations about health products advertised on the internet:

"Diabetes patients live in a daily balancing act that requires medicine and nutrition to prevent or delay devastating complications, therefore the treatments choices they make must be smart and the products they choose must be reliable".

On finding a health claim that looks misleading or unqualified a Surf' Day participant saves the advertisement and forwards it to the FTC. The FTC then evaluate the product or service and send e-mail messages to those advertisers that are considered need appropriate reliable scientific corroboration:

"We use the e-mail messages to make clear that laws against deceptive advertising apply not only to traditional media, but to the internet as well"

said Jodie Bernstein

The FTC will revisit those internet sites that have been sent e-mail messages to ensure that their warnings have been heeded and that suitable changes to the advertisement have taken place. Also, health claim advertisements deemed by the FTC as fraudulent are breaking the FTC Act and can lead to sanctions being imposed on future internet adverts. In addition, the FTC can reimburse monies to deceived consumers .

The success of the Surf Day can be measured by the number of spurious health claims found. Some www sites and Usenet newsgroups examined were claiming their products or services are 'miraculous'. These advertisements appear to be more cautious, disclosing limitations or warnings as to whether the product or plan is beneficial in treating or preventing a

health problem. However, in two days Surf Day participants uncovered over 400 dubious www sites as well as a number of Usenet newsgroups. And this is only "the tips of the iceberg", said Doyt Conn MD.

The FTC insists that the internet should not become a medium that propagates material quickly and anonymously. Neither should deceptive advertising and unscrupulous marketers destroy the credibility and viability of this vehicle:

"Our efforts also help legitimate marketers using this medium, we want consumers to trust promotional information on the web"

said Jodie Bernstein. Konrad Von Finckenstein and Jodie Bernstein agreed on the importance of the 'surf' day in protecting the most vulnerable members of society.

In addition to the North American Health Claim Surf Day, the Federal Trade Commission also organised a pyramid 'surf' day and in June 1997 launched "Compano Alerta" aimed at health fraud to the Spanish-speaking community.

Note

This article is based on information from the U.S. Federal Trade Commission internet web site: <<http://www.ftc.gov>>. Accessed 30 December 1997

ARTICLES

Normal Science, Paranormal Science and Relativism

By Dr. Dave Unsworth

Dr. Dave Unsworth is project manager and a part-time lecturer at Manchester Metropolitan University. He is also a member of ASKE.

Introduction

In this article I will consider the question of whether certain anti-scientific arguments undermine the ability of normal science (NS) to criticise the claims of paranormal science (PS). I will consider whether relativist arguments within the philosophies of natural and social science undermine the use of NS methods in the investigation of paranormal phenomena. I shall conclude that relativist anti-scientific arguments cannot be used to bolster the claims of PS. PS must still be judged by the criteria associated with NS if it wishes to be accepted as a legitimate mechanism for the investigation of the world.

Normal Science versus Paranormal Science

NS is an activity organised in such a way that the truth of its propositions are tested against the behaviour of the world. It achieves this by framing hypotheses in

ways which can be tested, by designing and conducting experiments, by organising and encouraging critical debate of its claims and by its ability to abandon concepts which do not survive the above processes. Its propositions are always contingent and subject to change when observation and theory indicate that they do not describe the world to an agreed level of accuracy. The objective of NS is to develop a contingent body of theory which describes natural generative mechanisms and predicts outcomes from natural processes.

PS has been attempting for many years to establish the reality of paranormal phenomena. Judged by the criteria associated with NS it has not been successful. This failure has not, in the main, deterred the supporters of PS from pursuing their goals. In order to explain this lack of success various explanations have been put forward. These include the claim that paranormally gifted subjects cannot produce paranormal

phenomena on a regular basis, that experimental controls cause a diminution of paranormal abilities and that the presence of people who do not accept the reality of the paranormal inhibit positive results. Whilst work within PS continues, NS practitioners are still without experimental phenomena which can be acknowledged as a hitherto undiscovered feature of the world.

Given the inability of PS to produce results acceptable to NS there has been a tendency to look to certain developments within the philosophies of natural and social science for reasons as to why this failure may not, of itself, be important. For example, consider the implications of the following propositions:

"There is no such thing as objective truth. We make our own truth. There is no such thing as objective reality. We make our own reality....Science itself is irrational and mystical. It is just another faith or belief system or myth, with no more justification than any other." (Schick and Vaughn 1995)

Such relativist positions are currently being debated within the philosophies of natural and social science. If this relativist proposition is true, then NS does not seem able to criticise the claims of PS or any other belief system. If not only knowledge of the world, but even the world itself, is wholly dependent upon what an individual or group accepts as knowledge and the world, then PS loses nothing by not being able to apply the methods of NS. It can claim, within its own belief system, to be a legitimate mechanism for describing the world. Whether NS criticises, supports or ignores PS becomes an irrelevance. And vice versa.

This relativist argument contains important observations about scientific practice. It draws attention to the fact that science is carried out by individuals and hence has an irremovable subjective component. When individuals group together in order to explore the world, then the interests of the group - and those who support the group - will invariably influence the choice and the direction of their research. Science takes place within a wider culture which operates according to unspoken and shared assumptions about what is legitimate and what is forbidden in the search for knowledge. Science within that culture will take on these assumptions. We expect that the propositions put forward by science to be certain, but a continued request for proof of the proof of the proof...

sends us into a regression which appears to undermine our belief that we can know anything.

Given the above, it seems naïve to insist that only NS and its notions of 'method', 'rationality' and 'explanation' can produce knowledge of the world.

Relativism in Natural Science

Debate about the rationality of the methodology of science was rekindled by Kuhn in *The Structure of Scientific Revolutions*. This classic text both revived old concerns about the relation between language and reality and provided a strong historical and philosophical argument for claiming that NS was just another way of looking at the world which could not claim to be more or less effective or true than any other ideology.

The traditional view of science is as an activity which attempts to explain and predict phenomena. It is taken as axiomatic that a 'phenomenon' is ontologically independent of the scientist and the theories which attempt to explain its behaviour and its development. But the nature of the gap between the reality and the language used to describe reality is as mysterious as it has always been. What, if anything, connects a proposition 'p' to the phenomenon, p, which it purports to explain? In order to talk meaningfully about this relation we need to construct a meta-theory: a theory which takes as its arguments both the theory and reality. It was Kuhn's achievement to cast doubt upon the claim that only one meta-theory (i.e. a philosophy of science which emphasises the use of experimentation and critical debate to disentangle the subjective assessment of the individual from an ontologically independent reality which is the subject of the investigation) was adequate to describe the relation between 'p' and p.

Kuhn's investigation into the history and nature of science addresses the fundamental issue of the relations between scientific theory, reality and the method which supposedly moves us from observation and development of the theory to knowledge about reality. Kuhn views science as 'paradigm based'. A paradigm is a model of scientific practice which is accepted by the majority of scientists as providing the criteria by which problems are characterised as legitimate, investigations are conducted, experiments designed, solutions formulated and disputes resolved. Working within a given paradigm results in

'normal science'. NS works to resolve those problems defined as scientifically meaningful by the prevailing paradigm.

Kuhn's analysis of the history of science suggests that NS throws up anomalies which cannot be accommodated within the prevailing paradigm. These anomalies are either (1) ignored, i.e. deemed non-scientific, (2) treated as additional problems within normal science or (3) work to undermine the faith of the scientists in the adequacy of the paradigm. If these anomalies increase then the paradigm itself may be rejected. A scientific revolution occurs. There is a paradigm shift.

This interpretation of the history of science is supported by Kuhn's arguments. However, this interpretation does not, of itself, provide support for PS critiques of NS. This support results from Kuhn's claim that paradigms are 'incommensurable', i.e. the paradigms possess no common measure or standard by which they can be compared. According to Kuhn, the criteria for evaluating and accepting a given paradigm are internal to the paradigm. The choice between paradigms cannot be made by appealing to neutral criteria, e.g. that the paradigm better "fits the facts", or has "greater explanatory power". Such criteria would only make sense within the paradigm since it is the paradigm which defines what "fitting the facts" or "having explanatory power" meant in each case. Scientific practitioners do not proceed from one paradigm to another by gradually developing and improving a particular method or theory contained within the former paradigm. Practitioners simply reject one paradigm and embrace another (incommensurable) paradigm. This shift is a conversion experience for the individuals concerned. It is a choice made on the basis of faith not reason since 'reason' only has meaning within the context of a particular paradigm.

It is this notion of scientific paradigms as non-rational intuitive leaps of faith which has such an attraction for advocates of PS and other non-NS ideologies. The inability of PS to design and conduct experiments which demonstrate the reality of paranormal phenomena becomes an irrelevance. Such a failure would only be relevant within the paradigm of NS. The paradigm of PS may define the notions of 'experiment' and 'proof' differently than the paradigm of NS. And since paradigms are incommensurable, neither set of definitions are any better or worse than the other in

respect of their ability to explain the world. Indeed, they are, according to the radical relativist, dealing with two different worlds.

Relativism in Social Science

These considerations are not unique to the natural sciences. Wittgenstein's notion of a 'language game' was developed by Peter Winch to construct a model of understanding within social science which seemed to rule out the possibility of both a scientific understanding of human behaviour and cross-cultural understanding. Winch's interpretation of language games as self-contained entities implied that each language game, and the community which gave rise to it, had its own definition of what was to count as real and, in the case of human behaviour, what is to count as a particular action. Relativism within social science follows naturally from this position. If I am not a part of a specific community which conducts its affairs, including its accounts of the meaning of its own behaviour and its world, via a language game that I cannot understand, it follows that I cannot understand what that behaviour means, nor what its reality consists of. My membership of my community only allows me to interpret my community's behaviour and understand reality only in so far as it is defined by my community's language game.

Criticism

Do the above arguments compel us to adopt a relativist interpretation of NS which in turn prevents criticism of PS and other belief systems?

The observation that science has an irreducible subjective component is, of course, true. Science is practised by people and people have feelings. However, the fact that an activity has a subjective component does not necessarily imply that the activity cannot be objective. Recognising their subjectivity people can and do attempt to be objective. As a group activity NS is specifically organised to subject claims to critical debate designed, in part, to discover and correct the subjectivity necessarily imported by single individuals. Subjectivity sometimes leads to mistakes. It also sometimes provides insight. Neither implication means that it is impossible to be correct and objective.

There is a crucial distinction to be made between the claim that theory is mind-dependent and the claim that what the theory refers to is mind-dependent. The former claim is both true and trivial. It merely asserts that a theory needs to be capable of being articulated if it is to be a theory at all and that only beings who have minds are capable of being articulate. However, it is a mistake to allow this trivial observation to introduce a significant subjective element into the ontological statements we use the theory to make. The statement of a theory is mind-dependent, but what the theory states need not be. A theory is necessarily articulated, but what it states is not dependent for its truth or otherwise upon that articulation. To ignore this is to conflate ontology and epistemology and make the universe exist only within our thoughts.

Can PS gain support from the inability of NS to supply justification for a claim, justification for the justification of the claim, and so on? Does the acknowledgement that scientific propositions are contingent entail that they cannot state relations of natural necessity between phenomena which are ontologically independent of the practitioners of NS? All that is implied by this argument is that propositions are conditional. We can be certain of our propositions as long as we understand this to mean that we have, at present, no reason to believe the propositions to be mistaken. "Certainty" in this context does not mean "logically certain". Our certainty derives from the support afforded the proposition by a whole network of beliefs, propositions and observations. The fact that we could be wrong does not imply that we are wrong.

Does the relativist argument imply that our arguments are convincing only because they employ "reason" which is, itself, suspect or illusory? Perhaps "reason" within NS is incomprehensible within, or inapplicable to, PS and vice versa. If this is the case we should ask whether this argument employs reason or not. If so, then it assumes what it is purporting to deny. If not, then we cannot understand what it is denying since we would be unable to recognise it as an argument.

The relativism advocated by Winch upon the basis of Wittgenstein's notions of "language games" and "forms of life" has had a similar impact upon the philosophy of social science as that generated by Kuhn within the philosophy of natural science. The core issue here is whether the grammar of human action as a

distinct language game can be translated into that of other language games, notably that of science. A radical extension of this claim is that cross-cultural understanding is impossible since such understanding operates according to the rules of its own language game. If we substitute "paradigms" for "language games" / "forms of life" we can see parallels between the two arguments. Arguments for the possibility of the translatability of language games across cultures provide grounds for denying that paradigms are incommensurable.

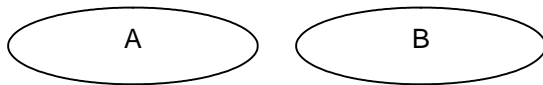
As finite human beings who cannot view history from an absolute vantage point outside of both time and a specific culture it is impossible to critically evaluate the knowledge expressed within a particular language game by reference to a set of absolute criteria. However, it does not follow from this that there cannot be any common reference point between language games which will enable the understanding and evaluation of competing claims.

We could argue that there is a common concern with knowledge within different language games or paradigms. Knowledge is only possible if we can make true statements. The proposition "p" is true if and only if p. From this we can derive the further proposition that true statements have ontological import. If "proposition 'p' is true" is true, then p is the case. If "There is a dog in the room" is true, then there is a dog in the room. In affirming the proposition to be true we are implicitly claiming that there is a correspondence between an expressive unit in a symbolic system (language) and something extra-linguistic (a state of affairs). Any particular correspondence depends upon a general correspondence between language and reality which gives the particular correspondence its sense. The truth of "p" is conditional upon the existence of a world which is independent of both "p" and the language game or paradigm in which "p" is articulated. Therefore, if different language games are concerned with knowledge, then there is a common assumption that there is a world which is independent of their language game. If this is not the case, then it is impossible to make true propositions about the world and knowledge would be impossible within the language game.

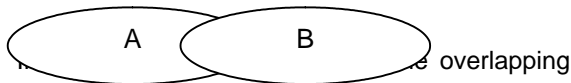
Therefore, even if we accept that language games are discreet we can see that there is still a common point of reference necessary for the intelligibility

of true propositions within the language game. This common point of reference is a world which is ontologically independent of knowledge about the world. Therefore, we can appeal to the world in order to assess competing claims from within discreet language games.

However, we can question whether language games are, in fact, discreet. A complete cultural system is composed of many different activities and practices. The question is whether different language games, e.g. religion and science, are hermetically isolated as discreet self-contained units. However, such language games can be seen as in a continuous state of dialogue with each other. These diverse ways of viewing, interpreting and understanding the world are not hermetically sealed. There is a circulation between experience, theory, representation and understanding which is informed by, and responsive to, the differences between language games. The relationship between language games A and B is not like this:



but like this:



There is an overlapping area that it is possible for NS to criticise PS and vice versa.

Conclusions

Therefore, I would argue that PS cannot compensate for its inability to provide convincing experimental results and subsequent unwillingness to allow critical scrutiny by appealing to a relativist theory which would label NS as an ephemeral and essentially

arational communal activity. The element of truth within relativism is that we cannot see the world or ourselves from a vantage point outside of a specific culture and time. From this it follows that we ought not to claim absolute validity for our propositions nor absolute certainty for our knowledge. But it does not follow that there cannot be theories which are more productive - because more accurate - than some other theories. In the realm of the physical and human sciences NS currently provides a method which appears to produce better descriptions of the world and ourselves than PS.

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The Science Wars in India

by Meera Nanda

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What do left intellectuals do when they know that they are too marginalized to change the world? They get busy interpreting the world, of course. And interpreting how we interpret the world, and how the non-Western "Others" interpret it, and how we interpret others' interpretations . . . and ad infinitum. The interpretive turn allows the left to create in discourse what it is unable to realize in the rough and tumble of real politics: a world where all ideologies have been deconstructed, revealed, and readied for overthrow; a world where all can live by their own lights. The inverse relationship between an explosion of high theory and a decline in political efficacy appears to be as true today as it was when Perry Anderson first observed it nearly two decades ago in his *Considerations of Western Marxism*.

What follows here is an appeal by an "Other," in whose name many contemporary left theorists justify their interpretive turn, to think about how their epistemological egalitarianism affects the urgent task of transforming oppressive social structures and cultural values in non-Western societies. I will argue that the recent rise in political and cultural visibility of the religious right (the Bharatiya Janata party, or BJP, and its affiliates) in my native India should give pause to all those academics in the West and in the third world who describe the rationality of "Western" science itself as a source of imperialism and racism.

Hindu nationalists have heeded the call for "decolonizing" science, and responded with aggressive propaganda for "Hindu ways of knowing," which they present as the locally embedded alternative to the alien and colonizing Western science. The two examples of the right's "Hinduization" of science and politics that I will discuss -- the introduction of Vedic mathematics in public schools and the spread of "Vastu shastra" (ancient Indian material science) -- do indeed meet the criteria of decolonized science advocated by left theorists: both are opposed to "Eurocentric Northern" ways of knowing; both are "situated knowledges" of non-Western people. The question I want to pose in the light of the BJP's victory is whether such knowledge is a step forward for women, minorities, and the desperately poor in non-Western

societies. Does the project of de-Westernizing science deserve the support of my fellow progressive intellectuals?

As a one-time biologist, science writer, and a partisan of science-for-the-people movements in India and in the United States, I have watched with increasing unease the transnational alliance that has emerged around the idea that the rationality of modern science encodes Western and imperialistic social-cultural values, and is therefore inimical to the interests of non-Western peoples. The alliance brings together some of the most avant-garde scholars in U.S. universities with the neopopulist, cultural-nationalist, "postcolonial" intellectuals from the third world, most notably India.

Indeed, the cluster of ideas that postmodernist intellectuals deploy to deconstruct the supposedly Eurocentric assumptions of modern science appears with high frequency in the discourse of Hindu fundamentalist parties. The Hindu right has proclaimed the twenty-first century a "Hindu century" on the theoretical grounds made respectable by left critics of science. These reverse Orientalists who glorify whatever the Western powers devalued are walking through the door that the critics of Orientalism opened for them. The tools that deconstruct also construct.

Constructivist theories of science have cleared a discursive and political space that the nationalistic right is only too eager to move into. Indeed, the right could not have wished for a more fashionable neighborhood to pitch its own tent in. Making the content and rationality of science an epiphenomenon of the wider cultural and social structures is no doubt useful for exposing the play of power in supposedly objective accounts of the world. But when science is joined to culture at the hip in the constructivist fashion, it also opens the door to the so-called "ethno-sciences" -- "Hindu science," "Islamic science," "third world women's science" -- wherein scientific rationality is subordinated to the "forms of life" of different communities. When the existing social values are allowed to decide the validity of knowledge, knowledge loses whatever power it has to critique these often oppressive values. It is this deference to the existing

"forms of life" that makes the project of constructing different ethno-sciences for different peoples so hospitable to all kinds of conservative social forces.

Thus, when the secular and mostly left-inclined critics claim -- in the language and tone that Alan Sokal managed to feign so convincingly in his *Social Text* hoax of last year -- that scientific facts cannot be judged as objectively true or false, but only from within the "regime of truth" established by social power, the religious right reads in it a justification for its demand that the validity of Hindu science be judged only on its "own terms." When the academic critics argue that scientific rationality must be subordinated to cultural instrumentalities, the religious right finds in it an affirmation of its own cultural chauvinism. One cannot avoid a shock of recognition when one reads, for instance, the BJP's recent *Humanistic Approach to Economic Development*, which insists that the cultural ethos of the Hindu *Rashtra* (nation) must become "a light onto itself," and have the final authority over what aspects of "foreign" science and technology are admitted into schools and other institutions. Hasn't one encountered similar appeals for integration of values and politics in knowledge-seeking activities in more academic, self-described "progressive" critiques of science? If the critics see science as a dystopian, arrogant and "God's-eye view of the world," supposedly transcending the material lives and beliefs of people, the BJP is only too happy to offer a supposedly humbler and more situated "Mother India's view of the world." If, as the critics charge, the very logic of modern science is a cultural expression of a Western "will to power," then the Hindu nationalists justifiably consider it their patriotic duty to resist modern science, and to replace it with ways of knowing informed by the imagined Hindu values of holism, communitarianism, and androgyny. Interestingly, the ruthlessness with which the critics interrogate "Western" science is matched in intensity only by their charity and solicitousness toward non-Western, pre-scientific ways of knowing.

I do not for a moment believe, and neither should I be read as claiming, that the cultural critics of science knowingly speak for the Hindu right. In fact, both from personal association and from their written works, I know these critics to be motivated by deeply egalitarian, radically democratic, and staunchly antiracist sentiments. I know that they have no sympathy whatsoever for the

anti-Muslim and anti-Christian platform of the Hindu right. But their personal politics and good intentions are not the issue here. What is an issue is the unintended impact of their theories on the lives of distant strangers. It is time the left critics of science ask: why is it that the religious right in India (and to a far more dangerous extent in Islamic countries) has been able to appropriate the theoretical language and conclusions of their intellectual labors? Isn't this appropriation reason enough to rethink some of their basic assumptions regarding science as social "all the way down"?

What fuels the antipathy of science critics toward those who wish to defend the traditional virtues of scientific realism, including the idea that although not free from cultural biases, scientific reasoning does incrementally lead to knowledge that corresponds to the actual state of affairs in the world? There was a time, not so long ago, when popularizing science was considered a progressive cause, and science was seen as a weapon against ancestral authority. (The flowering of a vigorous people's science movement in India through the seventies and the eighties, which openly advocated "Western" science for social revolution, motivated me to give up a career in biotechnology and become a science popularizer instead.) How has the left become so alienated from the institutional practices of natural science that it can find no use for them, in their present form, for progressive politics?

Limiting myself only to the recent battles in the "science wars," I believe I have a rough diagnosis of the left's disenchantment with science. The key word of my diagnosis is "empathy." As even a cursory reading of their work will show, the left academics who defend some variant of cultural relativism as "liberatory" believe that claims of universality of modern science prevent Westerners from fully empathizing with the moral and cognitive logics of others. Andrew Ross, for instance, seems to believe that supporting popular beliefs, say, in alternative medicine (his example) is a sign of "democratization from below," while those who demand that the popular beliefs be scientifically tested are elitist. According to Ross, only when we attenuate the claims of empirical rationality -- and recognize "different ways of doing science, ways that downgrade methodology, experiment, and manufacturing in favor of local environments, cultural values, and principles of social

justice" -- can we begin to move toward true diversity of knowledge systems.

Sandra Harding extends the empathy argument to non-Western "Others" when she claims that modern science is an "ethnoscience" of the West, with no more global purchase than any other culturally specific, local knowledge system. Because the West's ethnoscience has been molded on the twin templates of capitalist greed and imperialist expansion, she believes that it is "incapable of producing the kinds of knowledge needed for sustainable human life under democratic conditions," especially in societies with different natural and social orders. The need to empathize with other cultures in a multicultural world, Harding insists, requires that we give up the dream of a "one true science," and begin to live with a "borderland epistemology" -- an epistemology that "values the distinctive understandings of nature that different cultures have resources to generate." Knowers in different cultures can pick and choose sciences and combine them in a "knowledge collage" that serves whatever particular goal might be of interest to them at any given time. Thus, in Harding's "borderlands," the appropriation of modern science by other cultures can only be defended for pragmatic or political reasons, not on epistemological grounds.

For Harding, as for many other advocates of multicultural science, the impulse to empathize with non-Western "Others" requires that knowledge systems not be rank-ordered in terms of better or worse accounts of reality. They are "different" accounts that different social orders produce in order to cope with their culture- and language-bound perceptions of reality. And yet, cultural critics of science continue to deny that they have erased the line between science and nonscience. Such denials are surprising, for it has been shown many times over that any account of knowledge that makes the standards of validity (for example, logic, experiment, and evidence) internal to a culturally conditioned consensus cannot escape epistemological and judgmental relativism. But constructionists simply refuse to play ball with philosophers -- one more symptom, I presume, of the skepticism toward all abstractions that has come to define the post-all academy.

No doubt this empathy with the long-oppressed Others is liberatory for Western outsiders. But I contend that those insiders whose interest in a fuller, freer life has

long been frustrated by the oppressive elements of local, "situated" knowledge -- women, the "lower castes," and working people -- need a richer kind of empathy that includes respect, but also critique; love, but also anger. The oppressed Others do not need patronizing affirmations of their ways of knowing, as much as they need ways to challenge these ways of knowing. They do not need to be told that modern science is no less of a cultural narrative than their local knowledges, for they need the findings of modern science, understood as transcultural truths, in order to expose and challenge local knowledges.

I submit that the moment the Indian left began to talk the language of cultural constructionism, it lost the battle to the Hindu nationalists. Those of us associated with the people's science movements of the 1970s and the 1980s could use modern scientific knowledge to contest the dominant, largely Hindu world views on caste and women, precisely because we could claim that the content of science was not Western in any substantive way, and that it gave us a picture of the natural world that was as true for us in India as it was for anyone living anywhere on this planet. But when a small but highly influential group of Indian intellectuals, borrowing heavily from Western critics of the Enlightenment, began to argue that scientific rationality itself is a colonial construct, the people's science movements were left with no principled defense against accusations that popularization of modern science means internal colonization. Gradually, almost imperceptibly, the old, bold slogans of "science for social revolution" gave way to a parochial, almost obsessive compulsion to search and destroy any contaminating traces of the Western/colonial "episteme." Correspondingly, the cosmopolitan vision of socialism and secularism gave way to communitarian fantasies of Gandhian village republics -- which sound much more egalitarian than they have ever been in reality.

In this context, is it any surprise at all that the Hindu nationalists have been able to position themselves as the true defenders of non-Western ways of knowing? Themselves leading the charge for "decolonizing knowledge," what principled argument could the alliance of left-leaning and neo-Gandhian critics of modern science have offered when the Hindu fundamentalist parties began to replace modern mathematics with so-called "Vedic mathematics" in public schools? One of

BJP's first acts after coming to power in the state of Uttar Pradesh in 1992 was to make the study of Vedic mathematics compulsory for high school students. Explicitly stating an interest in "awakening national pride" among students, the government-approved textbooks replaced standard algebra and calculus with sixteen Sanskrit verses proclaimed by their author, Jagadguru Swami Shri Bharati Krishna Tirathji Maharaj, the high priest of Puri, to be of Vedic origin. Prominent Indian mathematicians and historians who have examined these verses believe that there is nothing Vedic about them, and that the Jagadguru has tried to pass off a set of clever formulas for quick computation as a piece of ancient wisdom. But that has not stopped BJP and other revivalist cultural movements in India from equating Jagadguru with Ramanujan in their hagiographies of Indian knowledge systems.

The problem with introducing supposedly indigenous and ancient knowledge is not that it is indigenous and ancient: there can, of course, be instances of ancient lore that can help us see a contemporary problem in a new light. The real issue is that the supposed Vedic mathematics, as many progressive Indian mathematicians and critics have argued, offers students mere tools for computation in place of the allegedly "Western" algebraic equations of which they are instances. In the name of national pride, students are being deprived of conceptual tools that are crucial in solving the real-world mathematical problems they will encounter as scientists and engineers.

Hinduization is not limited to mathematics alone. History curricula have always been favorite targets of religious nationalists. Under the growing influence of religious nationalists in the state and central governments, the earlier emphases on secularism is being reversed. New history textbooks celebrate all things Hindu (including even the caste system), propagate the myth of India as the original home of the "Aryan race," and deplore all "foreigners," including the Muslims. The history of Indian science and technology is not exempt. It is described as an unfolding of the Hindu genius, although material accomplishments (ancient technologies, for example) are emphasized over the penchant for critical inquiry that exists in some Indian traditions.

I have not come across any critique of Vedic mathematics from any of the intellectuals who have been so vocal in their criticism of "Western" science. The only opposition to the communalization of education has come from scientists, mathematicians, and other intellectuals associated with the people's science movements. It is quite likely that when confronted with the blatant nationalism driving such attempts, those who criticize modern science as a "Western" implant often try to distance themselves from the BJP's zeal for institutionalizing Vedic knowledge. But the fact remains that the BJP is not doing anything that those who see modern science as "inherently Western" have not themselves clamored for in the past. A good example is the well-known *"Penang Declaration on Science and Technology"* signed by prominent proponents of ethno-sciences in 1988. Among many other demands, the declaration calls for a system of education that "appreciates the value of indigenous scientific and technological culture...the teaching of science should never be divorced from the value-system of the indigenous civilization. The students should also develop a critical faculty so that they may judge the cultural and ideological bias of western science and technology." (The declaration is silent on the biases of indigenous civilizations.)

The BJP may be on the wrong side of the egalitarian ideals espoused by science critics, but it is by no means on the wrong side of their constructivist logic. The irony is that the largely academic critics who offer sophisticated theoretical justifications for indigenous sciences have the material resources and the opportunities to escape being grounded in them. Vedic mathematics and other projects for Hinduization of education does not personally affect most of the academic critics of science, for their own children hardly ever attend the state-run schools that cater to the poor or the BJP-run schools that cater to small businesses. Those who are most ardent about locally situated knowledges are the least embedded locally: most of them have one foot in the transnational academic world to which they regularly escape.

Another illustration of the co-option of the left's advocacy for indigenous knowledges by the powers-that-be is the recent craze for Vastu Shastra, the Sanskrit name for the ancient Vedic rules that govern the

construction of sacred buildings on the basis of the "auspiciousness" of space. If the practice of this Hindu science were limited to the nouveau riche in Delhi and Bombay, who build their houses to maximize the "positive energy" that comes with spatial correctness, one could ignore it. But last June we witnessed how cultural ideas can play a role in politics. N. T. Rama Rao, the late chief minister of the southern state of Andhra Pradesh, sought the help of a traditional Vastu Shastris to help him out of some political rough weather, and was told that his troubles would vanish if he entered his office from an east-facing gate. But on the east side of his office there was a slum through which his car could not pass. The chief minister ordered the slum to be demolished.

If the Indian left were as active in the people's science movement as it used to be, it would have led an agitation not only against the demolition of people's homes, but also against the superstition that was used to justify it. In a case like this, modern science and social justice were clearly pulling in the same direction, and the left could easily have made the pure irrationality of Vastu Shastra an opportunity for consciousness raising. A left movement that was not so busy establishing "respect" for non-Western knowledge would never have allowed the power-wielders to hide behind indigenous "experts."

I tried out this case on my social constructionist friends here in the United States. Although they see the injustice of the situation, they do not see why I am so exercised about the irrationality that led to it. We have our

superstitions in the West, they tell me. Did not Nancy Reagan consult astrologers? As for my suggestion that if we want justice, we must challenge the irrationality of ideas that lead to injustice, I am told that there is no need for proving that Vastu Shastra is wrong and modern science correct. I am told that seeing the two culturally bound descriptions of space at par with each other is progressive in itself, for then neither can claim to know the absolute truth, and thus tradition will lose its hold on people's mind. I am told that this desire to prove that traditional knowledge is an incorrect representation of nature is a sign of a scientific mind-set, a hangover from my training in biology that I must overcome if I do not want to re-engineer the society of my birth on technocratic lines. Finally, I am told that I am an incorrigible modernist if I believe that Western science has any democracy-enhancing potential in my part of the world.

After all this, I should hardly be surprised when I hear my position labeled as that of the "antidemocratic right," as it often is within the radical circles of science critics. I plead guilty to believing that modern science is not something to be deconstructed and overcome. It must have an active role in progressive politics. The alternative is staring us all in the face. It is called religious fundamentalism, and it is not pretty.

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Therapeutic Touch: The Technique and the Survey

By Dr. Mervyn Darville

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Introduction

This review contains a discussion of alternative therapy (AT) in general, a description and attempted explanation of Therapeutic Touch (TT) in particular, and comments on the Survey on Therapeutic Touch "Research" (Rosa, 1997). Before I begin, I flag my

scepticism with the following instructive recollection. As young children, friends and I used to build "walkie-talkie radios" out of cardboard boxes, bits of wire and dead batteries. We imagined that these radios really worked and had many hours of fun playing and "communicating" with them. Later, while studying science at school, I

understood why our radios could not have worked. Unfortunately, this seems to me to be the level of scientific understanding of some followers of AT and it is reflected in its presentation in the popular media.

Alternative Therapies

However, resisting the temptation to be uncritically dismissive, it is helpful to keep an open mind about alternative therapies and ask why is there such a demand for them in today's society. This is a complex question, to which I provide some suggestions based on my own observations.

One reason, exemplified by the public reaction observed in response to the death of Diana, Princess of Wales, is that, despite the decline in traditional religion, most people still need to be able to suspend critical judgement and are able to find comfort in just believing.

Science generally, as well as scientific medicine, is difficult to understand, may be counter-intuitive and is often poorly presented to the public. Furthermore, modern medicine tends to be impersonal and, of course, is not infallible. Few medical practitioners are trained in the scientific method (which in fact may make them more likely to embrace AT or complementary medicine) and some may lack compassion. There is little wonder, therefore, that some patients can derive a feeling of well-being from a therapist who is sympathetic, uncritical, confident and caring and who can calm by handling or touch. Clearly, there is benefit to a patient's state of mind from such treatment. There could be little criticism if this approach complemented conventional scientific medicine rather than tried to supplant it, while at the same time invoking spurious scientific credentials.

The scientific process is rigorous but, like mathematics, has a universal language. It is false, therefore, to talk about cultural bias. Indeed, science (it is diminishing and pejorative to refer to it as "Western Science") faced severe cultural and religious obstacles in its long opposition by the western establishment, who were concerned by the challenge it presented to ancient received "truths". This is uncomfortably like the opposition to science mounted by some "alternative" practitioners and "New Agers" today. These people are intelligent and persuasive, able to present their activities in a respectable light by the (mis)use of scientific terminology

and by making unreasonable claims on scientific knowledge through making the wrong connections. They skilfully and selectively sample from real science and often quickly adopt and misinterpret cutting edge scientific findings in esoteric areas. Quantum theory is a current favourite. Nevertheless, the reluctance always to embrace methodically conducted scientific research and the attacks on sceptical scientists suggest that much of their work is sheltered behind a wall of excessive defensiveness.

In modern medicine scientific evidence is required before a new therapy is adopted, whereas TT and other ATs are used in the continuing absence of such evidence. They are thus in no way evidence-based. The work is not supported by repeatable results in blind trials and what cannot be proved relies on faith and credulity. Thus, as presented by many practitioners, TT and other ATs usually require the suspension of critical judgement.

This is a great pity, because the attempts to claim scientific credibility undermine the value of ATs as techniques for promoting positive attitudes to health. Although hard evidence for organic effects cannot be demonstrated, I am not sufficiently cynical to suggest that feelings of well being engendered by ATs cannot contribute to general improvements in health. Furthermore, I am quite prepared to accept that in complementary medicine or alternative therapy in the widest sense of the terms there is bound to be something of value which rigorous science will identify.

In much of the AT literature which I have read the language is science-like but unscientific, coming over more as jargon which has been learned parrot-fashion rather than as terminology which is understood. It is well-leavened with standard new age mystic phraseology. It tends to assert rather than argue and to deny rather than refute. It is also somewhat reminiscent of modern NHS audit terminology with the word "accredit" achieving prominence, its presence alone being enough to bestow validity upon the content. If the expression can be excused, the language comes over much as the worst (maybe managers would say the best) of management bullshit.

TT - The Practice and the Evidence

In reviewing the evidence (or the lack of it) for TT and other "alternative" therapies it is vital to avoid emotional debunking. This does not serve the interests of real science and may help to generate misplaced sympathy amongst the uncommitted.

The central feature of Therapeutic Touch is the claim that living things generate and emit so-called "energy fields", the nature of which is always unspecified. Such nebulous and imprecise usage is clearly an abuse of the scientific term of energy, which can be fully defined. This abuse of the term is common to many ATs and "New Age" ideas. Another commonly used term is "life energy" but again this is used without definition. Life energy as understood by biologists depends on cell metabolism, which is well understood, but no mention is made of this in "alternative" publications.

If we use current scientific knowledge to speculate on the nature of these supposed fields then what could they be? Some candidates would be electromagnetic radiation produced by cellular electrical activity, heat, infra-red radiation, humidity gradients and volatile chemicals. It is surprising that alternative publications rarely if ever discuss either the expected properties of the "fields" they invoke or scientifically sound methods which might detect them. After all, there are many reports in reliable literature of the biological effects of at least the magnetic component of electromagnetic fields. These include, for example, altered rates of cell growth (Liboff *et al*, 1984), membrane changes (Paradisi *et al*, 1993), changes in polypeptide synthesis (Goodman and Henderson, 1988) and tumour promotion (Struchly *et al*, 1992).

It is further claimed that the field differs in health and illness. Should the field exist then this is not an unreasonable statement to make but again, since its nature is unknown, changes in the field have not been detected, measured and reported objectively. TT theory then claims that the "fields" and variations in them can be detected by a practitioner's hands, without touching the body, although no attempt is made to explain the identity of the receptors in the hands. Having detected an abnormal "field", the therapist can modulate and correct this with the hands, thus "healing" the source of the abnormal "field". Yet again, there is no explanation of the mechanism of modulation by which this can occur, or of how this can correct physical problems in the body.

It must be emphasised that the areas in which TT has been claimed to be clinically effective are usually those in which the outcome is assessed subjectively, such as pain relief, stress and relaxation. In areas where more objective evaluation is available, such as malignant and infectious diseases, the evidence is very thin. There is also little appreciation of controls and statistical analysis.

The whole basis of TT thus relies on the existence of fields which have never been scientifically demonstrated, let alone modulated to effect changes in the person generating it. Thus TT is either magic or misunderstanding. It might even be fraud, a seduction of the uninformed, gullible or desperate by the unscrupulous or the self-deluded.

There is a notable failure to publish in scientific journals and, although TT proponents would argue that editorial boards are biased, it is clear from reading papers in peripheral journals that they could not be published because of their lack of quality and scientific rigour, rather than on the subject matter *per se*. When apparently positive results are reported they cannot be repeated and there is a preponderance of anecdotes and case reports. The authors make much of the claim that their work is peer-reviewed. Here, as in real science, we may be a little wary of peer-review. In the former there may be the motives of professional jealousy and in ATs the lack of thoroughgoing critical detachment.

However, just to get our feet back on the ground, it is worth remembering the pompous *Lancet* article published when Gregg first postulated the now proven link between Rubella and congenital abnormality:

"The lay public have always held that congenital malformations have an extrinsic explanation...it will be strange if the influence of a mild illness in the first months of pregnancy, accompanied by a rash, has escaped attention." (Anon, 1944)

The survey

The Survey on Therapeutic Touch "Research" (Rosa, 1997) was written because of the concern of many health care professionals in the US that "quackery" has infiltrated modern medicine. It describes TT and its practice, lists the claims made for it by its practitioners, provides a historical review and surveys the literature. In

some institutions, especially in the USA, it is clearly becoming a brave act to challenge the entrenched AT enthusiasts. The survey has been prepared with the best of motives and in places is very good.

Unfortunately, the overall impression it gives is unsatisfactory, which is more a problem of presentation than of content. The document is not well laid out, leading to lack of clarity, while the sections on the TT literature are haphazardly and confusingly presented. Critiques are not provided for all of the publications listed, while there is over use of the same few critiques in relation to many of the papers shown.

The recommendations made in the survey are vague and woolly. Most damaging is that it fails to present rationally conducted science positively in contrast with AT work. It will take a much more direct, incisive, clear document to shake entrenched "alternative" beliefs.

Conclusions

It is easy to differentiate real science done badly, mistakenly, falsely, or fraudulently from "science" requiring faith. Defective "real" science is usually in areas with existing scientific knowledge, the perpetrators are trained scientists with expertise and experience in the subject and, for a while at least, the work seems plausible. In due course, however, whether the research is in established or new areas, other researchers find that the work is unrepeatable and it gets dropped from the body of scientific knowledge. This critical and rigorous attitude is replaced in pseudoscience by a soft uncritical consensus, by differences of opinion which cannot be based on scientific data and by a tendency for self-

deception. The crucial weakness of TT as with many other ATs is that firm objective evidence for any benefit to the patient is lacking. Until or unless ATs can be shown to have as sound a basis as conventional medicine it is simply dishonest for anyone to claim otherwise.

A problem for sceptical organisations and their publications is that they mainly appeal only to sceptics. It is vital to consider how to get the message across to the general public if we wish to halt and then reverse the tide of pseudo-science. The Channel 4 programme *Equinox: Secrets of the Psychics* recently effectively exposed and demolished a wide range of claims about paranormal phenomena. We should ask now for the same to be done with alternative therapies.

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Testing a Therapeutic Touch Practitioner

by Bob Glickman and DeeAnne Wymer

This article was first published in Phactum (June 1997, 3(2)), the newsletter of the Philadelphia Association for Critical Thinking (PhACT), and is reprinted with kind permission. The test described in the article was conducted in connection with a prize offered by the James Randi Educational Foundation to anyone who can demonstrate a paranormal ability under controlled conditions. Bob Glickman is a registered nurse and Chairman of PhACT. DeeAnne Waymer is a professor of anthropology at Bloomsburg University, Pa, where, amongst other things, she teaches a course on the critical analysis of pseudoscience.

With over 40,000 Therapeutic Touch Practitioners (TTP), you would think more than one would have leapt at the chance to earn \$742,000 (which could be kept or given to charity), prove to the world that a TTP

can feel the alleged human energy field (HEF) and prove to James Randi that paranormal powers are real. You could think this but you would be wrong. Last November's [1986] TT test drew only one participant who was

nontraditional and not a nurse. As of this writing, with the award now up to \$1,100,000, there have been no takers for the test scheduled for June 2, 3, and 4 in Fort Lauderdale, Florida.

As things progress, we should consider ourselves fortunate that there was one person willing to be tested at all. The difficulty in trying to develop a workable test almost prevented November's event from happening at all. Nancy Woods, practitioner and teacher of TT, is a massage therapist by trade and lives in California. She charges \$75 for a TT treatment, takes Visa and Mastercard, and the service is free if it does not work. She was so interested in the test that she offered to fly to the test site at her own expense. Woods had in mind her own version of a test. She wanted to gather several people with aches and pains (migraine headaches are her specialty, she claims) and she would treat them. Then we would see how many felt better. She had little interest in the fact that there was no double-blinding in this type of test. It was explained several times that the focus of the test was to see if TTPs are able to feel energy fields.

The test was conducted in the Short Procedure Unit [at Frankford Hospital, Philadelphia] (SPU) which was unoccupied at the time of testing. The SPU is a self-contained nine bed unit. Only one of the nine rooms has a door that can be closed with the other eight having curtains that are drawn for privacy. Present for the test were several PhACT members and other nurses and health care workers interested in TT. We were quite fortunate to have Bela Scheiber, the President of the Rocky Mountain Skeptics be in town and be present for the proceedings. Of course, acting as moderator and overseer was James Randi.

The test design was based on a fiberglass construction, the "TT 109," that has two sleeves that allow either one or both arms or legs to be inserted into it. This test unit would be secured to a standard hospital bedside table. This table would then be anchored to the foot of a stretcher bed. The footboard was removed so that a person could lie on the bed and easily place their arms or legs into the unit's sleeves. The test unit would be hidden under a sheet and the subject behind a curtain. Our initial test protocol was designed that, on the basis of a coin toss, either the left or right arm would be inserted in the unit. The TTP would assess the energy fields through the sleeves and declare which sleeve was occupied. In

addition, a video recorder, positioned within the hospital bed area, was utilized to record the test.

Ms. Woods' abilities differ from that of the average TTP. The test was modified from its original design to accommodate her abilities. She states that, to her, a normal arm or leg does not have a field or sensation she can detect and is indistinguishable from no limb at all. She said that an injured or painful limb, however, to her could feel like a cold, hot or "pulling" sensation. It was arranged for a few people with painful conditions to be available for the test. One was Maureen Ketrick, a 57 year old female with a painful left foot and ankle for the past four years. She has been diagnosed as having tarsal tunnel syndrome, plantar fasciitis and exostosis of the heel and has been treated with cortisone injections by her podiatrist with no lasting relief.

Another potential patient was "Pam" (PM), a 42 year old female and self-described "gypsy" who believes in paranormal phenomena. This was her first introduction to TT. Pam hit her right hand against an air conditioner three years ago and has been treated by an M.D. with minimal relief. She wears a brace on her right wrist when she works. She also has occasional pain in her left wrist.

The third potential patient was Glickman's 13 year old daughter Brianne who has had chronic headaches because of a TMJ-type chewing disorder. She had been receiving trigger point injections with moderate relief of her headache pain. She had a moderate headache the night of the test. She was really just a back-up because the testing parameters would need serious modifications if we needed to accommodate testing different heads.

Upon Woods' arrival, she was informed her of each person's condition and allowed to assess them. The first to be assessed was Ketrick. Woods noted a cold sensation over the left foot and ankle, the affected side. Woods then noticed coldness around the right foot, the normal foot. As the assessment continued, Woods stated that there was a difference in the field already and the cold sensation is almost gone. Ketrick made an important observation at this point, "But my foot still hurts!"

Ms. Woods turned her attention to Brianne Glickman mentioning that she loved to work with migraines. After a few minutes of "working" with her, Woods asked Brianne if she felt anything or if she felt any improvement. Although Brianne responded, "No," she

later stated that she felt an obligation to respond "Yes," because if the insistent way Ms. Woods asked her. Ms. Woods also stated that at the end of this session, Brianne's field would change as she assessed it.

It soon appeared that there might not be any testing at all because of the constant changes and inadvertent healing caused by Woods assessments. This is another way that Woods' talents differ from the average TTP. In TT there is a component called "intentionality" where the TTP intentionally transmits energy to balance and treat their patient. Woods seems to have little control over this aspect.

Multiple attempts were made to find some kind of mutually acceptable test. A final attempt was made with both Ketrick and Pam taking turns with their limbs in the TT 109 unit. Randi asked Woods whether or not she could feel a difference. Her response was that she could not feel a difference between the two subjects. After some more discussion, Woods stated, "I can feel a difference if someone is not injured...and someone is..." At this point, Scheiber volunteered that he was perfectly healthy and had no problems with his arms. In Woods' assessment of his arms, she noted coolness in his right arm which she "worked on" and for some reason she felt drawn to his left elbow.

After some more discussion, Woods agreed that she would be able to successfully determine the difference between Pam and Scheiber. This led to an open test where Woods could see which subject was in place. The subject was determined by a coin flip and Woods was able to identify the field or sensations 10 out of 10 times. See Table 1.

The next step was a preliminary closed test. In the "closed" test, a curtain was drawn across the foot of a hospital bed, effectively preventing anyone on the opposite side from identifying the participant. Three individuals awaited within this partitioned area, our two subjects (Pam and Scheiber) and Eric Krieg who conducted the coin toss and recorded the results. Woods was taken into an adjacent room and the door was closed. At a signal, the coin was tossed, determining whether Pam or Scheiber would lie on their stomachs on the hospital bed and insert their arms into the TT 109. At

the call of "ready," Woods was brought into the testing area, allowed to approach the testing device, and proceeded to determine whether Pam or Scheiber had their arms in the casing. Woods would assess the TT 109 with her hands hovering a few inches above the unit. She would then describe her sensations and her conclusion about the individual's identity which were recorded (see Table 2).

At the close of the test, Woods and the other participants waited in a nearby lounge for the results. The tabulations revealed that Woods was correct in her identification of the subject 11 times out of 20. This, of course, was well within the domain of chance.

It was quite apparent from watching Woods perform her assessment that her choice of "sidedness" (which limb or body area emitted the sensations she claimed to feel) might be based upon her own motor predilection. One could suspect that Woods is most likely right-handed. The descriptions noted in the open test that she "preferred" to locate ailments/sensations on the patient's left side - her right side. Wymer noted that Woods focused on the left side (her right hand) much more frequently and made larger and more frequent "hovering" motions with her right hand than with her left. Wymer suspected that this bias is unconscious on Woods' part and merely reflects her own handedness. This may be an interesting avenue for critical analysis of TT- if someone can correlate a greater percentage of "sensations" claimed by TTPs on one side or the other for their patients/participants and discovers that this tends to correlate to their own handedness, we could suggest that there is an unconscious bias on part of TT based on their own motor skills (hence, another factor implicating that what a TTP senses is based on their own suggestibility).

At this point in time, this event may represent the last time a TTP is willing to step up and try to prove that their is a basis for the concept of someone being able to feel a human energy field.

Table 1

Open Test

Trial 1:	Participant:	Subject's Comments:
1	PM	Feels coolness on (participant's) left (L); nothing on right (R)
2	BS	Doesn't feel a whole lot ("Not a whole lot"); less than PM
3	PM	She's changed... warm on L...less on R... totally different"
4	BS	She is drawn to his L elbow and not much else
5	BS	Seems to take longer...feels L elbow and nothing else
6	BS	Similar to before - L elbow
7	PM	Feels cold on top L...thinks PM is more tense
8	BS	L elbow...nothing else...gets more subtle with each one
9	BS	He's cold (referring to elbow)...nothing else
10	BS	Felt cool on left towards wrist area and nothing on right

Table 2

Closed Test

Trial:	Actual	Response:	Subject's Comments:
1	PM	BS	Feels heat on L...cold on R..."He's different"
2	PM	PM	Feels warm then "it got hot" on L
3	PM	BS	"My first thought is...nobody is here"
4	PM	PM	Feels cold
5	PM	PM	"It's a girl"...feels cold
6	BS	BS	"Very subtle change here...I'm toying...having to struggle...difficult to guess...I'm going to say a guy"
7	PM	PM	"It's a girl"...feeling cold at top L
8	PM	BS	"It's a guy...nothing...he is less whacked"
9	BS	PM	"It's her"...feels cold on lower L
10	PM	BS	"Not much of anything...more of a turkey shoot now because they've changed so much"
11	PM	PM	Focuses on L..."It's a girl" but feels torn... feels something on upper L
12	BS	PM	It's a girl"...she senses something on lower L but can't go up because of curtain
<i>Continued on next page...</i>			
13	PM	PM	Again female...doesn't feel drawn to L side
14	BS	BS	Her hand wants to go up into the curtain (to elbow)
15	PM	PM	Cold on lower L...not drawn to elbow..."this is interesting"
16	BS	PM	No desire to "go up"...cold on lower L
17	BS	BS	Doesn't feel cold...drawn to elbow
18	PM	BS	Touches elbow..."Cold up here"
19	PM	BS	I'm not drawn to the L elbow but I think it's he guy... don't feel much"
20	BS	BS	"I think it's the guy...didn't notice a whole lot"--

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The Moon Was Full and Nothing Happened: A Review of Studies on the Moon and Human Behavior and Human Belief

by I. W. KELLY, JAMES ROTTON, and ROGER CULVER

This article (a revised and updated version of an article that appeared in the Skeptical Inquirer, 10(2), Winter 1985-86) was first published in J. Nickell, B. Karr and T. Genoni (eds.), The Outer Edge: Classic Investigations of the Paranormal, Buffalo: Committee for the Scientific Investigation of Claims of the Paranormal (1996) and is reprinted with kind permission. Ivan Kelly is a professor of psychology at the University of Saskatchewan, Canada. James Rotton is a professor of psychology at Florida International University. Roger Culver is an astronomer at Colorado State University.

It is commonly assumed that a full moon brings out the worst in people. Those who advocate lunar effects on human behavior invariably begin reports by reminding readers that "lunacy" and "lunatic" are derived from *luna*, the Latin word for moon. Although lunacy is an outdated concept, investigators have tried to link the phases of the moon to such behaviors as alcoholism, madness, epilepsy, somnambulism (sleep walking), suicide, crisis calls, birthrates, homicide, arson, and, of course, lycanthropy (werewolfism).

Arnold Lieber (1978), a Miami psychiatrist, used the term *lunar effect* when referring to supposed links between phases of the moon and behavior. Critics prefer the term *Transylvania effect* (Shapiro et al. 1970). As one might guess, those who defend the lunar hypothesis have objected to the latter "because it conjures up visions of werewolves and Draculas" (Garzino, 1982, p. 399). In our view, however, neither term is appropriate, since the word *effect* implies that investigators can establish something more than a correlation in this area. Obviously, without having a "control group" on a planet without a moon (perhaps a random sample of Venusians), it is very difficult to show that lunar phase exerts a causal influence on behavior.

In the first part of this article, we describe results from a meta-analysis of studies that examined relationships between phases of the moon and behavior (Rotton & Kelly, 1985a). We also note several studies and reviews that appeared after we completed our meta-analysis. In the second part, we speculate about why lunar beliefs persist despite the absence of reliable linkages between phases of the moon and behavior.

Research on Lunar Cycles and behavior

Rotton and Kelly (1985a) combined data from 37 published and unpublished studies in a meta-analysis that had examined relationships between the moon's synodic

(4-phase) cycle and abnormal, deviant, and criminal behavior. Meta-analysis is a statistical procedure that combines results from empirical investigations. It allows reviewers to do three things: 1) estimate the overall or combined probability of results from different studies; 2) assess the size of relationships when results are averaged; and 3) identify factors that might help to explain why some studies have obtained apparently reliable results while others have not. This meta-analysis differed in one important respect from those that have been undertaken to resolve controversies in other areas: it included a reanalysis of results from previously published studies.

Of the 23 studies we checked, nearly one-half contained one or more statistical errors. Some of these were serious enough to prompt us to publish interim reports (Kelly & Rotton, 1983; Rotton, Kelly, & Frey, 1983) to correct errors that had crept into the literature. For example, we found that Lieber and Sherin (1972) had employed inappropriate and misleading statistical procedures in their often-cited study of homicides in Dade County, Florida. On the basis of binomial tests of significance, they claimed that a disproportionate number of homicides occurred during the 24-hour period before and after full moons. We found that this claim was based upon 48 tests of significance, which are not reported in their article. The more tests conducted, the more likely one is to find positive results that are actually due to chance. The positive outcomes thus selected look more spectacular when the negative tests are left out.

To make matters worse, their tests were not independent. They were based on overlapping days of the lunar cycle, making the results very difficult to interpret. For example, in one set of analyses they looked "at the three days before and after, three days before, three days after, two days before and after, two days before, two days after, one day before and after, one day

before, one to two days after, and one to three days after full moon" (Rotton et al. 1983, p. 111; Rotton & Kelly 1985c). Applying more appropriate test procedures, it was found that homicides were evenly distributed across phases of the moon.

In another study, Templer, Veleber, and Brooner (1982) claimed that a disproportionate number of traffic accidents occurred during the night hours of the three-day periods of the new moon and the full moon. However, as Kelly and Rotton (1983) noted, a larger number of the full- and new-moon nights cited in the study fell on weekends. This suggested that apparent relationships might stem from the fact that more accidents occur on weekend than on weekdays. This suggestion was later confirmed by reanalysis of their data. Templer, Corgiat, and Brooner (1983) found that relationships vanished when they included controls for holidays, weekends, and months of the year. To their credit, they were willing to revise their original hypothesis: "It is likely that some, perhaps all, of the significant phase-behavior findings in the literature are a function of day of week or holiday or season artifact" (Templer et al. 1983, p. 994).

As these examples illustrate, a meta-analysis is no better than the studies on which it is based. In our meta-analysis, we took several steps to locate relevant articles and papers, including a computer search of the literature. Correcting for errors in original reports, we found that there was no consistent relationship between phases of the moon and acts usually described as lunatic. Taken as a whole, our results confirm the generally negative conclusions reached in prior reviews (Abell, 1981; Cooke & Coles, 1978; Campbell & Beets, 1978; Kelly, 1981). For every study that had found that people behave more strangely than usual when the moon is full, another had found that people's behavior was not affected.

Indeed, phases of the moon accounted for no more than 3/100 of 1 percent of the variability in activities usually termed *lunacy*. Estimating the percentage of unusual episodes that occurred during the quarter (25 percent) of the time when the moon is full, we found that about 25.7 percent of the episodes had occurred during full-moon periods. Of course there may be some who will claim that a difference of 0.7 percent is theoretically interesting. However, we are not impressed by a

difference that would require 74,477 cases to attain significance in a conventional (i.e., chi-square) analysis.

Some might object that we averaged over important differences when we combined data from different studies. To deal with this objection, we considered factors thought to moderate relationships between phases of the moon and behavior: sex of subject, type of lunar cycle (synodic vs. anomalistic or apogee-perigee), geographical features, and type of lunacy (namely, mental hospital admissions, disturbed behavior in psychiatric settings, calls to crisis centers, homicides, and other criminal offences). Several traditional (non-meta-analytic) reviews of studies of lunar relationships and human behavior have been published since our 1985 meta-analysis. Byrnes and Kelly (1992) looked at 12 studies that considered the relationships between lunar phase and crisis calls to police stations, poison centers, and crisis intervention centers. Across the studies they found no evidence of a trend for more calls to be reported around the full moon. The majority of studies yielded no relationship between lunar phase and crisis calls and the positive findings contradicted each other. Three studies not found in the Byrnes and Kelly review supported their negative conclusions in regard to lunar phase. Lab and Hirschel (1988) examined the claim that assaultive and property crimes would increase as the full moon approached and decrease with daily distance from the full moon. The time of each offense was determined for 14,081 property offenses and 5,836 assaultive crimes over a one year period in Charlotte, North Carolina. Analyses were conducted for daily totals and separately for daylight and nighttime. The full moon lunar phase hypothesis was not supported by the data in any of the instances considered. Two more recent crisis call studies also found no consistent relationship with lunar phase. Cohn (1993) considered all calls for police service relating to rape (2,018 calls) and domestic violence (82,057 calls) over a three year period in Minneapolis. Time of day and weekday were useful predictors of these calls but lunar phase and lunar distance were not. Similarly, Bickis, Kelly and Byrnes (1995) found replicable weekly, annual, and semi-weekly cycles over a three year period of crisis calls in Vancouver, but lunar cycles were not related to the number of calls. Two reviews have examined the widespread belief that lunar phase is related to the

number of babies born. Folklore has it that more babies are born around the full moon than other times. Martens, Kelly and Saklofske (1988) considered evidence from 21 studies and a follow-up by Kelly and Martens (1994) examined a further six studies. The studies were conducted in 10 different countries. The majority of studies found no relationship between lunar phase and birthrate. With studies that did find a relationship, it was just as likely that an elevated birthrate would be found at one of the other quarters as the full moon phase. Another extensive review that included European studies on lunar phase and birthrate as early as 1829, similarly concluded that the relationship was not supported (Wunder 1995). Three recent international studies not found in the above reviews also failed to find any association between the full moon and frequency of birth. Benski and Gerin (1991) analyzed birthdays of 4,256 babies born in the maternity ward of the large Grenoble clinic in France and found them equally distributed throughout the synodic (phase) lunar cycle. The relationship between moon phase and number of spontaneous deliveries was examined by Periti and Biagiotti (1994) in Italy. A total of 7842 spontaneous deliveries at the Ostetric and Gynaecologic Clinic of the University of Florence was analyzed for a 5-year period. The median number of births were compared across moon phase by two different divisions - lunar day (29.5 days) and lunar phase (full moon, third quarter, new moon and first quarter). In both cases, no relationship between moon phase and number of spontaneous deliveries was uncovered. Caton (1995) examined 45 million (yes, million) live births over a thirteen year period in the United States and found a very weak peak around the third quarter. The full moon and new moon phase days were associated with an average or slightly below average birthrate.

A belief that is common amongst community health individuals is that rate of suicide is related to the lunar cycle. However, a review of 20 studies examining the relations between completed suicide or attempted suicide and suicide threats with lunar phase found again that most studies obtained no such association and the positive studies were inconsistent (Martens, Kelly & Saklofske, 1992).

If there was something to folklore one might expect a disproportionate number of disasters of various kinds to occur around the full moon. An exploratory

preliminary investigation by Kelly, Saklofske and Culver (1990) of famous railroad, explosion, mine, aircraft, fire disasters and noteworthy assassinations and kidnappings uncovered no relationships with lunar phase. However, spectacular events and disasters are, by definition, uncommon and the sample sizes were in many cases small (for example, 50 in some instances). Studies using larger numbers of cases investigating specific types of disasters have also failed to uncover lunar relationships. Kelly, Laverty and Saklofske (1990) found no evidence for a relationship between 364 worldwide automobile disasters (those involving ten or more deaths) over a twenty-two year period and the synodic lunar cycle, the distance of the moon from the earth, or lunar-solar tidal pull. In a study of 1,457 worldwide maritime disasters, Branham (1995) similarly found no relationship with lunar phase.

A number of individual studies have examined the relationship between a variety of other human behaviors and lunar cycles with similar negative results. For example, Russell and Dua (1983) examined relationships between phases of the moon and aggressive episodes during Western Hockey League games. They based their conclusions upon aggressive infractions recorded during the 1978-79 hockey season. After looking at several types of aggression, they concluded that "the present investigation offers no support for a lunar-aggression hypothesis" (p.43). Russell and de Graaf (1986) replicated the earlier study on hockey infractions on a new season (1983-84) of the Western Hockey League. As in the earlier study, they found no evidence of a relationship between hockey aggression and moon phase. Likewise, Atlas (1984) uncovered no relationship between lunar phases and violent episodes in Florida prisons. Wilde (1996) examined lunar phase and student misbehaviors in middle school children and found, contrary to folklore, a small reduction in misbehaviors at the third quarter but similar numbers at the other three lunar phases.

Sanduleak (1985) examined relationships between lunar cycle and homicides in Cleveland, Ohio. His study is noteworthy, because Lieber and Serin (1972) previously claimed that they had uncovered a reliable relationship between lunar cycles and homicides in this city. They based their conclusion on data between 1958 and 1970, whereas Sanduleak covered the period from

1971 through 1981 in his follow-up study. Sanduleak's results are aptly summarized by the title of his article: "*The Moon Is Acquitted of Murder in Cleveland.*"

No relationship between psychiatric admissions and lunar phase was found by Gorvin and Roberts (1994). And, contrary to folklore, Sands and Miller (1991) found the full moon was associated with a very slight decrease in absenteeism. Laverty, Kelly, Flynn and Rotton (1992) analyzed the daily total number of traffic accidents and accident severity for a six year period in Saskatchewan, Canada, and did not uncover any relationship with any of the lunar cycles. Larsen and Kasimatis (1990) examined daily fluctuations in mood, using spectral analysis, and there was no evidence of a 28- to 30-day (lunar) peak in mood (Larsen et al. 1990, Figure 1, p. 167). Cohen-Mansfield, Marx and Werner (1989) obtained no relationship between agitated behavior in nursing home residents and the lunar cycle even when tests were conducted on three different categorizations of the synodic lunar cycle. Coates, Jehle, and Cottingham (1989) found no association between moon phase and the incidence of major trauma (assault, gunshot wounds and stabbings). The Coates et al. findings are consistent with those of Stair (1978) who found no lunar relationship with the number of visits to a general medical emergency room. Macdonald, Perkins and Pickering (1994) examined 6,013 out-of-hours calls to physicians over a two year period. When the researchers controlled for year, month, weekend and bank holidays, no lunar phase (phase-day ± 3 days for new moon, first quarter, last quarter, and full moon) was associated with increased numbers of calls. And Vance (1996) found no relationship between lunar phase and frequency of behavioral outbursts with mentally challenged adults in a rural setting.

On the other hand, Davenhill and Johnson (1979) claimed to have detected a relationship between various personality traits, as measured by the Eysenck Personality Inventory (EPI) and Cattell's 16 Personality (PF) and changes in the lunar cycle. However, Startup and Russell (1985) criticized their research, pointing out that the Davenhill and Johnson study employed only a very small sample (12 males and 12 females) and only covered a short period of time (two lunar cycles). Using 881 subjects over a two-year period and a more powerful statistical technique, Startup and Russell could replicate

none of the findings obtained in the earlier study on the Eysenck Personality Questionnaire (EPQ, a revised form of the EPI) and only one with the 16 PF. However, the minuscule size of the relationship precludes any practical use, and the authors caution that it would be unwise to attach theoretical significance to this singular finding until it can be replicated by others.

Belief in Lunar Effects

Rotton and Kelly (1985b) found that one-half (49.7%) of the students at a Florida university agreed that some people behave strangely when the moon is full. Similar levels of belief have been recorded for students at a Canadian university (Russell & Dua, 1983), in Singapore (Otis & Kou, 1984) and for health professionals in the United States (Vance, 1995). Crowe and Miura (1995) surveyed 330 University of Hawaii students and 40 faculty and found about the same percentage in both groups (60%) endorsed the idea that some good evidence exists that the moon affects behavior. For more specific claims, the percentages endorsing the claims were smaller in both groups. About 27% of students and faculty believed that it was at least "possibly true" that more births happen around the full moon. However, more students (34%) than faculty (18%) were willing to consider menstrual cycles were related to moon phase. What accounts for belief in lunar effects? Although researchers have only begun to pursue this question, we suspect that belief in lunar effects can be traced to four factors. One of these can be termed "media effects." A second is folklore and tradition. Another is misconceptions about physical factors. The fourth, and in some ways most interesting, is a set of cognitive biases that lead individuals to look to the moon when they witness unusual and apparently senseless types of behavior.

Media effects

The moon looms large over popular culture. The association of the moon with mental instability is constantly propounded by the media. This is a very popular motif in Hollywood movie scenes in such films as Albee's *Who is Afraid of Virginia Wolf* (1966). The movie begins with a camera shot of a full moon that seems to be gliding through dark clouds. Thus the audience is prepared for the struggle for dominance and the untimely cruelty that is to be established between husband and

wife. Prior to violent acts in the movie version of Golding's *Lord of the Flies* (1991) and Stephen King's *Misery* (1990) the movie camera zooms in on the full moon. In the movie *Lazer Moor* (1992), a homicidal maniac kills during every full moon in a large city. The police hero in the movie *The Hidden* (1987), after a particularly vicious murder, states, "What is this, a full moon?" Several shopping centers in Canada periodically advertise their "Moonlight Madness" sale. A hair salon called Elegant Ensemble in North America advocates following the phases of the moon in styling hair. A very popular country and western music album was called "Full Moon Fever" and a best selling computer video game is entitled "Under a Killing Moon." And of course there's the song "Full Moon Rising" in the movie *A Werewolf in London*. With the constant media repetition of an association between the full moon and human behavior it is not surprising that such beliefs are widespread in the general public. These salient media invented associations between the full moon and extreme behaviors can lead people to overestimate the likelihood of such behaviors occurring at other full moons (Health et al., 1994).

Newspapers, television programs, and radio shows favor individuals who claim that a full moon influences behavior. Arnold Lieber, one of those favoring the lunar hypothesis, has appeared on several talk shows, including the nationally syndicated "In Search of..." In 1984 his research was highlighted on ABC's "20/20." This supposedly objective report began with its host, Hugh Downs, suggesting that lunar effects provided evidence for astrology: "The moon's effects are legendary and, according to some, the most obvious example of astrology - that ancient belief that has in the past twenty years become big business."

Newspapers, of course, are in the business of telling people what happened. "The moon was full, and nothing happened" may be accurate, but it is not a very interesting headline. In research on curiosity and information-seeking, it is something of a truism that "good news is no news" (Rotton, Heslin & Blake, 1983, p.49). When reporters call us on the phone, they would probably be happier if we assure them by saying, "The streets are full of loonies when the moon is full." Unfortunately, when one scientist doesn't give them a quotation that can be turned into an interesting headline, they can always find an "expert" who will provide the quotation they need. In

the international television program "Forces Beyond" (1994), one segment dealt with lunar effects on human behavior. An advocate of such effects in the documentary was described as a "lunar cycle expert." In fact, this "expert" was an accountant, who had never published any research studies on the topic. This individual edited a lunar newsletter informing readers about the best lunar phase times to be romantic, sexy, and energetic.

For a reporter interested in writing a story, it is not hard to find somebody who will talk about an uncle, say, who acted peculiarly when the moon was full. (Who doesn't have a peculiar uncle?) Those who defend the lunar hypothesis are not above resorting to case histories and personal anecdotes. For example, after failing to uncover a statistical relationship between the moon's apogee-perigee (far-near) cycle and behavior, Lieber and Sherin (1972) indicated that a "perusal of official narratives on individual incidents of homicides indicates that homicides occurring during these periods are often of a particularly bizarre or ruthless nature" (p. 105). As Meyers (1983) has observed, "anecdotes are often more persuasive than factual data" (p.120). To dramatize the supposed effects of the full moon, for example, "20/20" showed pictures of Miami police being called out to keep a young man from killing himself. The announcer's voiceover:

Even before the moon has risen and the sun still commands the sky, it starts: A confused young man has a cocked pistol to his head. The special response team is in place. If the subject points the gun at anyone else, he will be shot There are scenes like this somewhere every day, but in Dade County, Florida, at least, the special response team call-outs to incidents like this peaked at the time of the full moon-month after month¹.

A major problem with the use of such personal experience anecdotes is that, by themselves, they are not very reliable indicators of actually existing relationships. There was much anecdotal "evidence" for the alleged efficacy of the much touted cures for cancer such as krebiozen or laetrile, which later research showed to be unfounded. Our ancestors would have been able to similarly "prove" on the basis of personal experience and anecdotes that those who become ill on the eighth day of the new moon are likely to die, that one can get rid of warts by rubbing them at the correct lunar phase, and that

one can cure a child of whooping cough by taking it outside to look at the new moon (Radford & Radford, 1948; Opie & Tatem, 1989). The history of medicine and psychology are littered with the debris of beliefs that were once widely held by both professionals and the general public on the basis of "personal experience" but discredited by later in-depth research and new knowledge (Dolan, 1993; Gordon, 1993).

A second problem with collecting stories and anecdotes as evidence in favor of a specific hypothesis is that an incomplete picture is presented since failures and inconsistencies are ignored, dismissed, or explained away. Books by lunar advocates contain many carefully chosen examples of spectacular events occurring at the full moon, but one would have little trouble writing an article full of identical types of events happening during any other lunar phase. For example, Britain's worst soccer disaster (94 dead, 170 injured), the worst aviation disaster in history (Canary Islands, March 27, 1977, 582 deaths), the 15+ billion dollar California earthquake of 1994, the massacre of 14 young women engineering students in Montreal by a disturbed, anti-feminist gunman, the Chicago-gangster-arranged St. Valentine's day massacre in 1929, and the President Kennedy assassination, for starters, all occurred around the *first quarter*. This start could easily be expanded to produce an article chock full of terrible events that were associated with the "infamous first quarter."

Folklore and Tradition

Tradition and folklore contain a large number of fallacious beliefs. For example, many widespread and popular beliefs such as "Don't swim for an hour after eating," "You should rub snow on frostbite," "Reading in the dark will ruin your eyes," "You can catch cold from being chilled" and "The more you cut your hair, the faster it grows" are not true (Kohn, 1990). Similarly, the popular belief that sugar makes children hyperactive is without foundation (Wolraich, Wilson, & White, 1995). Appealing to the fact that beliefs about the full moon are widespread and found in folklore is therefore hardly a good ground for acceptance of lunar relationships with human behavior.

Misconceptions

Given the moon's obvious effects upon ocean tides, it is not surprising that scholars as well as students have jumped to the conclusion that it might also affect people's behavior. "If the moon can do that to oceans," our students say, "imagine what it can do to us!" In a similar vein, Lieber (1978) advocates a biological tide hypothesis. He contends:

Because the [human] body [like the earth] is composed of 80 percent water and 20 percent 'land' or solids, it is reasonable to assume that gravity exerts a direct effect on water mass of the body, just as it does on the water mass of the planet (p. 115).

The following discussion on the biological tide hypothesis is cursory. More sophisticated discussion of this issue can be found in Culver, Rotton and Kelly (1988) and Quincey (1994).

Lieber's analogy fails because it is too weak to

$$\left(\frac{55 \text{ kg}}{7.35 \times 10^{22} \text{ kg}} \right) \cdot \left(\frac{3.78 \times 10^8 \text{ m}}{0.15 \text{ m}} \right)^3 = 1.2 \times 10^7$$

warrant the inference he wants to draw. As Campbell (1982) points out:

Only the *surface* of the earth has this 80:20 ratio ... yet gravity involves a traction between three-dimensional structures (and their total masses, not just surface composition). Hence, the argument based on a similar water-solid ratio between earth and the human body is 'untenable' (p. 421)

In addition, the moon causes tides only in unbounded bodies of water like the world's oceans (Abell, 1981; Campbell 1982; Culver, Kelly & Rotton, 1986). Bounded bodies of water, such as land-locked lakes, unless they are very large (like the Great Lakes), are negligibly influenced. Clearly the water contained in the human body falls into the "bounded waters" category.

Even if we surmount these problems - for example, by assuming an idealized human who is uniformly covered by a layer of unbounded perspiration - gravitational mechanics still offers no support for the ideas of biological tides. The expression for the tidal force F_{TIDE} to which an object of radius R will be subjected can be readily derived from the principles of classical mechanics: $F_{TIDE} = 2GRM/d^3$ where G is the universal

gravitation constant, M is the mass of the tide-raising object, and d is the distance between the center of mass of two objects involved. A comparison of the tide-raising capabilities F_1 and F_2 of two separate objects on a given person can then be written as

$$\frac{F_1}{F_2} = \left(\frac{M_1}{M_2} \right) \cdot \left(\frac{d_2}{d_1} \right)^3$$

where M_1 and M_2 are respective masses and d_1 and d_2 the respective distances of the tide-raising objects. As an example, suppose we wish to compare the tidal forces of a mother, the attending doctor, and the building on a newborn child with that of the moon. If the hospital is located on the side of the earth's surface nearest the moon, then the moon's center of mass will be about 378,000 km distant. Assuming the mother's distance from the child while she holds it is 15 cm or so, then a 55 kg mother will exert

or 12 million times as much tidal force on her child as the moon. Calculations for the doctor and the fractional mass of the building contained within a radius equal to the child-building center of mass distance will yield similar results. In fact, it can be easily shown that we would have far more tidal concerns from a downtown area with lots of large-mass buildings and crowded streets than from the sun or the moon.

The biological-tide hypothesis fails on a number of other counts. In our review (Rotton & Kelly, 1985a) we found six studies that have looked at the distance of the moon from the earth and various types of behavior. Only one obtained significant results, and these were contrary to the biological-tide theory: more undesirable behavior occurred when the moon was *farthest* from the earth. In addition, Lieber argued that we would expect lunar-related behaviors to be more pronounced at the Equator than at more distant latitudes and to have an amplitude variation in keeping with the times of lunar perigee and apogee. We found no evidence for this contention in our review. Also, Sanduleak (1985) did not obtain significant results when he examined relationships between homicidal assaults and a tidal index that was proportional to the magnitude of the combined lunar and solar tide action. Russell and de Graaf (1986) found no relationship between distance of the moon from the earth and

aggression in hockey games. Other studies finding no association between human behavior and lunar distance are Cohn (1993), and Kelly, Laverty and Saklofske (1990). Macdonald et al. (1994) did find a small reduction in out-of-hours calls to physicians when the moon was furthest from the earth but, contrary to folklore, obtained only an average number of calls when the moon was closest to the earth.

Although Lieber and Sherin (1972) originally attributed supposed correlations between phases of the moon and behavior to water imbalances, Lieber (1978), Katzeff (1981), and others have proposed competing hypotheses. Garzino (1982), for example, has speculated about ion effects:

Because the moon modulates the earth's magnetic field, the entering ions follow a lunar cycle. During the full-moon phase, positive ions come down to earth *in great abundance*. But positive charged ions are now suspected by some scientists to create depression and irritability by increasing levels of serotonin in the nervous system. Serotonin is a mood-modifying chemical, a "downer." [p. 408, italics added. See also, Abel, 1976; Katzeff, 1981; Ossenkopp & Ossenkopp, 1973.]

Interestingly, Gilbert (1980) measured ion levels in a school for mentally retarded children. He found no evidence for the ion hypothesis. Indeed, in his study, he observed more disturbed behavior when the moon was new than when it was full.

Unfortunately, there is no good evidence that the central premise is true - namely that positive ions are more prevalent when the moon is full (Rotton, 1987). The other competing explanations for alleged lunar effects suffer similar faults (Culver, Rotton & Kelly, 1988).

One interesting observation that some may believe is relevant to human behavior is the finding that the moon has a measurable relationship to daily global temperature (Szpir, 1996). Unfortunately, this doesn't seem to be relevant to our concerns. The effect is very weak, "the phase of the moon accounts for a global variation of about 0.02 to 0.03 degrees Celsius ... [and] such a small anomaly accounts for much less than one percent of the monthly variation in temperature" (Szpir, 1996, p. 119). Also, contrary to folklore, the warmest days are around the first quarter and coolest during the new moon. It also depends where you live. The research

"found that high latitudes (poleward of 70°) and subtropical latitudes (around 30° North and South) were positively correlated with the global pattern, whereas the middle latitudes (about 50° North and South) are negatively correlated. Temperatures at the equator had no relation to the synodic cycle of global temperatures (Szpir, 1996, p. 120).

It is of more than passing interest that we have not been able to locate studies that have examined correlations between lunar cycles and hormone levels and other physiological functions. The absence of research on physiological processes is, in many ways, surprising. Some of those who favor the lunar hypothesis are physicians, such as Lieber, who speculate about physiological processes. Why have they not obtained blood or urine samples to determine if there is, in fact, a lunar relationship with hormone levels? As Asimov (1985) has observed, such evidence would be much more convincing than statistical analyses of homicide and crime rates:

...If these rhythms affect such things as our response to drugs or our tendency to violence or depression, then the rhythms must affect our internal workings. There must be a fourteen-day rise and fall in hormone production; or such a rise and fall in the activity of our immune system, or our cerebral drug receptors, or various aspects of our neurochemistry (p. 8)

For several years now, investigators have been monitoring individuals' biochemical levels in hospitals and physiological laboratories in research aimed at answering other questions (e.g. Reinberg & Smolensky, 1983). In most cases, they use spectral analysis to detect day-to-day and hour-to-hour changes in biological assays and electro-dermal activities². Given the large number of scientists involved in this research, it is hard to believe that a 14-day or 29-day cycle could go undetected. Those who favor the lunar hypothesis often cite Brown's work on the activity patterns of oysters (Brown, 1954; for criticism of Brown's work see Quincey, 1993) and hamsters (Brown & Park, 1967; for a failure to replicate this research, see Klinowska, 1972). Some of these authors have published books on biological rhythms (e.g. Garzino, 1982). Strangely enough, they do not report anything resembling a 29-day cycle in human activity levels. Given the large number of studies done (in both

the United States and West Germany) on the effects of social isolation (e.g. Luce, 1971; Minors & Waterhouse, 1981), it is surprising that we could find only one study related to lunar phase and physiological processes, and this was in regard to nutrient intake. De Castro and Pearcey (1995) investigated the lunar variations in the meal and alcohol patterns of 694 adults over a nine year period. The authors report a small increase in meal size at full moon along with (contrary to folklore) slight decreases in alcohol consumption at the full moon. While the results of the study appear interesting, an examination of the analysis reveals numerous methodological and statistical puzzles that caution one against acceptance of the authors' conclusions³.

Cognitive Biases

A number of cognitive biases contribute to belief in lunar effects. One is selective perception: Individuals are more likely to notice events that support their beliefs than those that do not. Further, individuals are more likely to look for a cause when they notice unusual behavior. Because the moon is conspicuous and its absence is not, it will be an object commonly invoked to explain odd events and behavior. When something odd happens, what other object is so impressively in view as a full moon? However, in research done at Florida International University, it was found that students do no better than chance when they are asked to guess the moon's phase. As Sanduleak (1985) observed, it does not seem likely that "even the most ardent proponent of a lunar effect could specify the phase of the moon...I have tested audiences and found that only a very small percentage could" (p. 6).

Social psychologists have found that most of us look to others when we have to make decisions (i.e. what they call "social reality"), and we often act like "cognitive misers" - that is, we look for simple solutions and base our decisions upon the first piece of information we receive (Fisk & Taylor, 1991; Hansen, 1980). Thus, we have to wonder how many individuals check to see if the moon is full when an unusual event occurs and somebody says "Must be a full moon tonight." An interesting instance of this occurred in game four (Oct 20, 1993) of the American baseball World Series. This was acknowledged by all to have been the wildest, most

unpredictable World Series game ever played. The television sports announcer proclaimed "It must be a full moon!" In fact, the game occurred just before the first quarter! One wonders how many listeners took the announcer's statement at face value and made the spurious connection between the pandemonium in the game and the full moon.

Selective recall is another bias that contributes to belief in lunar effects. We often recall positive instances and forget negative ones (Nisbett & Ross, 1980). Individuals may recall all the full-moon nights when something untoward happened while forgetting the uneventful full-moon nights and the many more non-full-moon nights when they witnessed unusual behavior. Who noticed that Britain's worst mass murder by a lone gunman (16 Scottish elementary school children on March 13, 1996) occurred at the third quarter? If it had occurred around the full moon it would have been cited by believers as another instance of lunar mayhem. Selective recall can be influenced by stereotypes. As an example of this, McFarlane and Williams (1994) conducted a longitudinal prospective study in which men and women kept detailed diaries of their daily mood fluctuations. Interestingly, very few individuals experienced cyclicity centered around the full moon (more did around the first quarter) but when the participants were asked to remember their cycles, one-third believed (contrary to their own daily diaries) their negative moods were more often associated with the full moon!

Selective attention and recall contribute to illusory correlations (Rotton, 1985a). Individuals find it hard to believe that events are random and unrelated, especially when they vary over time. For some, "Everything is related to everything else" is not just an ecological slogan; it is, instead, a principle that guides their thinking and leads them to interpret randomly distributed events as confirming their beliefs. As Meyers (1983, p. 129) has observed: "When we believe a correlation exists between two things, we are more likely to notice and recall confirming than disconfirming instances."

Illusory correlation is a special instance of a more general and confirmatory bias (Mahoney & DeMonbreun, 1978; Snyder & Swann, 1978; Watson & Johnson-Laird, 1972). Most of us seek data that support our beliefs, preconceptions, and hypotheses. It is commonly

assumed that scientists are mainly interested in obtaining data that will support their theories and hypotheses. Unfortunately, as philosophers (e.g. Hempel, 1966; Salmon, 1984) have suggested, thinking rarely advances when one adopts a confirmatory strategy. We learn a great deal more when our hypotheses are shown to be responsive to contrary evidence and criticism.

Yet another bias is selective exposure, which leads believers to watch TV shows and read books that confirm their beliefs. Although research on the selective exposure hypothesis has produced mixed results, Otis (1979) found belief in one paranormal phenomenon (UFOs) predicts movie preferences. In her study, individuals standing in line to see *Close Encounters of the Third Kind* were more willing to endorse pro-UFO items than were individuals waiting to see other movies (specifically, *The Gauntlet* and *Saturday Night Fever*). There is evidence that beliefs in lunar effects comprise part of a constellation of belief in paranormal phenomena. Rotton and Kelly (1985b) found that students who scored lower on tests of logical ability, and those who believed in reincarnation, ESP, and astrology were more likely to endorse beliefs in lunar effects.

Any of these biases may act as a self-fulfilling prophecy, leading to actions that confirm people's beliefs (Russell & de Graaf, 1986). For example, if police officers believe that a full moon causes criminal behavior, they might become more vigilant and make more arrests on full-moon than other nights (Frey, Rotton & Barry, 1979). In this regard, it is interesting to note that Rotton, Kelly and Elotegui (1986) found that police officers were more likely to endorse items indicative of belief in lunar effects than a haphazard sample of pedestrians (the proverbial "man and woman on the street").

Conclusion

This article outlines the results of a meta-analysis of 37 studies and several more recent reviews and studies that examined lunar variables and mental behavior. This article supports the view that there is no causal relationship between lunar phenomena and human behavior. We also speculate on why belief in such relationships is prevalent in our society. A lack of understanding of physics, undue reliance on folk-lore as a

reliable source of beliefs, psychological biases, and slanted media reporting are suggested as some possible reasons.

It is important to note that there are two hurdles to overcome before any findings on lunar variables and human behavior are deserving of public attention. The first hurdle is that *reliable* (i.e., replicable) findings need to be reported by independent investigators. If, as folklore would have us believe, relationships between lunar phases and human behavior are strong and obvious, why do studies have such difficulty in uncovering them? And why are positive relationships that are uncovered so inconsistent (Flynn, 1991)? The second hurdle is that the relationship should not be a trivial one. A weak relationship between lunar cycles and human behavior would be of *theoretical* interest but would have little or no predictive value for the practical lives of people. The lunar hypothesis fails on both counts.

Notes

1. These quotes were transcribed from a cassette recording of the November 8, 1984, broadcast.
2. Any complex curve can be described in terms of a number of pure sinewaves that differ in amplitude, frequency (cycles per unit time), and initial phase or starting time. Spectral analysis is simply a mathematical procedure that allows an investigator to describe a wave in terms of pure waves. As Rotton (1985b) has noted, it is ideally suited for uncovering "hidden periodicities" in behavior.
3. First, it is not clear how they could combine the reports for a 7-day period for each of the 694 subjects to cover a complete lunar cycle and yet fail to consider the possibility of confounding with seasonal and weekend effects. For example, alcohol intake might increase relative to meal size in hot weather, or decrease if dining in a unlicensed restaurant, both of which might be spuriously related to lunar periodicities via seasonal or weekend effects, so we need to know to what extent such possibilities have been evaluated or controlled, but the authors say nothing. (Thanks to Geoffrey Dean for this point.)

Second, the statistical analyses seem confused. The authors appear to have pooled cases, in an unexplained manner, to form F ratios. Best we can figure out, they took each subject's 7 observations and assigned them to whichever of the moon's 8 periods they fell in. But there are only 694 independent cases, which means that the error variances of the F ratios contain both between-subject and within-subject variances to a varying but unspecified degree. As close as we can tell, the F ratios are based on 260 cases; that is, the number one gets when one divides 1813 by 7, from the $r(7,1813)$. Note: The degrees of freedom in a between-within ANOVA equals $(q-1)(N-1)$, where $q=8$ periods and $N=260$, i.e., $7 \times 59 = 1813$.

Third, as the authors note on page 443, "the effects are fairly small." We would term them "very small." Here are the values of η^2 (effect size or ES) that we get. For $F(7,1813)=2.01$, $ES=.0077$ (meal size). For fat content, $F(3,1573)=2.64$, $ES=.00508$. For alcohol (a negative r), $F(3,1573)=3.16$, $ES=.00599$. In other words, all of the effect sizes correspond to less than one percent of the variance. Note: The formulas used can be found on page 18 of the 4th edition of the Publication Manual of the APA (APA, 1994).

Fourth, the authors do not report results from individual comparisons. It is possible for an overall F to attain significance and not any of the follow-up paired comparisons among means. (Statistical significance might be achieved if one used a liberal t-test. But what if one controlled for experimentwise error by doing a Tukey and even a Newman-Keuls?)

Finally, as the authors note, "there is no clear explanation as to why..." No fooling! What we have are "facts" in search of a theory, an example of dustbowl empiricism of Fortean fact-finding at its worse.

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Skepticism and Film-Makers

By Mark Lipczynski

Mark Lipczynski is the Secretary of Wessex Films, the film unit of the University of Southampton

As a film maker I am always searching for ideas and material to make new films. Over the past year I have been actively trying to merge my love of films with another of my major interests: skepticism.

It has long been my opinion that the best way to get skepticism and the art of critical thinking across to a mass audience is through the media of film and television. So far the current output of television programmes is not encouraging. The big money is still to be made promoting the paranormal. Skepticism is nowhere near as marketable.

Over the last few years the number of programmes lending support to claims of the paranormal has increased, largely due to the success of *The X-Files*. Television shows such as *The Paranormal World of Paul McKenna*, *Beyond Belief* and *Strange But True* have all been aired to audiences well in the millions. These programmes disgracefully cloak themselves with claims to serious scientific investigation whilst paying little heed to true scientific principles. At the start of one of his shows Paul McKenna defined the paranormal as anything science could not explain. If that is the case, Paul, there was absolutely nothing paranormal in any of your shows. A little critical thinking would easily have revealed this. There was little in evidence.

Programmes that apply a little skepticism to the proceedings are few. The recent Equinox programme, *Secrets of the Psychics*, was long overdue, but aired as it was on Channel Four it could never hope to attract the same number of viewers as any of the other programmes with prime time ITV slots.

One show which broke the mould was *James Randi: Psychic Investigator*, which was aired on ITV in the early 1990s. This programme effectively made me a skeptic at a relatively young age. To see so-called psychics routinely fail to demonstrate any psychic ability week after week had a big effect on me but not, it would appear, on many others. Belief in the paranormal continues unabated.

And there is the problem. Books, films and television concerning the paranormal sell. People want to believe that there is more to life than the laws of physics. UFOs, alien abductions, corn crop circles, faith healing, ESP, tarot, astrology and Israeli-born psychic spoon benders are far more wonderful and easier to accept than the view of the world offered by science. As James Randi's programme demonstrated, people don't like to see the paranormal fail; it's too depressing.

How can skeptical film making avoid this trap? How can we make skepticism accessible and captivating? How do we go about showing people that science and evolution are far more wonderful and awe-inspiring than watching some bloke bend a spoon? This is a paradox which I hope to overcome. Carl Sagan had some ideas as to how this might be achieved in his last book *The Demon Haunted World*. I would be interested to know if any members of ASKE have any suggestions.

There is great potential in strong links between skeptics and film-makers. I find that skepticism and critical thinking are exciting disciplines and I would like to share this enthusiasm with a wider audience.

BELIEFS AND FICTIONS

By Doug Bramwell

Doug Bramwell is a mechanical engineer turned technical journalist. He is a member of ASKE.

Robin Le Poidevin. *Arguing for Atheism; an Introduction to the Philosophy of Religion*. 1996. Routledge. Hardback: ISBN 0-415-09337-6 (£37.50) Softback: ISBN 0-415-09338-4 (£11.99)

Contents: Must the universe have a cause? Is God necessary? Could the universe have an explanation? Are we the outcome of chance or design? Does the universe have a purpose? Are God and ethics inseparable or incompatible? Is there a problem of evil? Is

God a fiction? Is 'Does God exist' a real question? Should the atheist fear death? Also: chapter summaries; suggested reading; bibliography; glossary; index.

Full marks to Le Poidevin for a volume whose clarity and conciseness make it a pleasure to read. The discussion includes, and clarifies, contemporary variants of the traditional arguments for and against the existence of God, and goes on to outline an approach to a 'religion without God'. This interlocking complex of ideas is made eminently comprehensible to the non-specialist.

The author restates, and discusses, several versions of the cosmological argument for the existence of God as a first cause of the universe. He concludes that, because of its relationship to time, such a first cause is so different from the ordinary notion of a cause, that the universe cannot be said to be caused in any ordinary sense of the word.

Le Poidevin also deals with traditional and current versions of the ontological argument, in which analysis of the word 'God' is said to show that God's existence is logically necessary. A traditional version, first expounded by St Anselm, is generally regarded as being invalid. However, a current version, known as the modal ontological argument, makes use of the ideas of possibility and necessity, and has given rise to much controversy. The involvement of modal logic in these and other contemporary philosophical arguments has led, for reasons of argumentative clarity, to the concept of possible worlds, but the author's considerable comments lead him to conclude that the concept is an unsatisfactory one for the theist.

Traditional teleological arguments for God's existence, based on a supposed design or purpose in the universe have, since Darwin, been increasingly considered to be both superfluous and invalid. On the other hand, recent teleological arguments have claimed to see purpose, not in the end results of natural laws, in the traditional way, but in the laws themselves. Some scientists, for example, noting that the occurrence of life in the universe has depended on some supposedly improbable values for fundamental physical constants, have concluded that the intervention, if not of a traditional God, then of some creative intelligence, is required. However, such arguments take the concept of probability outside its normal context, and it can be argued that it is

not intelligible to talk of the inherent probability of natural laws in the universe as a whole.

Accepting that we are not the outcome of design, some nevertheless still seek an explanation, of some sort, for observed values of the fundamental constants and, for them, the weak anthropic principal is on offer. This is said to explain critical features of the universe by pointing out that if they were absent, we would not be here to observe them. Le Poidevin argues that the weak anthropic principal is not trivial, because the relationship which it seeks is causal and not logical; the point is currently controversial.

An alternative explanation, the strong anthropic principle, states that the universe must have the properties which allow the development of observers within it. Although not always made clear by its advocates, the 'must' is intended in the strong sense that implies that the universe has a purpose, and this seems, to many, to be merely a restatement of the argument from design. Possible escape routes are provided by science; firstly, some versions of the inflationary big-bang theory allow for the existence of multiple universes with differing physical constants and, secondly, an as-yet-to-be-discovered theory-of-everything may provide an ultimate explanation.

The author discusses a moral version of the strong anthropic principal, in which the universe has to be such as to permit the emergence of moral agents. After discussing the selfish gene hypothesis, he concludes that this version leads, once more, in the direction of theism and, it would seem, the argument from design.

In considering that most difficult of all the theist's problems - that of the presence of evil in a world supposedly created by a God both omnipotent and benevolent - Le Poidevin discusses, at length, the traditional theistic defences which centre on human freedom and determinism. Many theists admit, that these defences are inadequate and, in the case of the suffering caused by natural disasters, they are not even relevant. An alternative theistic stance is that the justification of evil is just not accessible to us - surely an admission of defeat.

Unable to resolve the difficulties that confront them, some theists argue that we may usefully continue to deploy religious language even if we do not take it to be descriptive of reality - in other words, even if we accept

that God does not exist. Le Poidevin argues that religion without God - religious observances, even if make-believe - can benefit the individual and the community.

Many readers will be unable to support the author's advocacy of such pseudo-religious practices, or believe that, in the long term, they could lead to a healthy stability in a society of unbelievers. Similar arguments might be put forward in support of behaviour relating to aliens, spiritual healers, channellers, gurus and fortune tellers, even if they are known to be fictional or fraudulent. Looking back over the history of organised religion, few atheists or doubters could feel confidence in the benefits of religious practice - whether directed toward an object of fiction, or of supposed fact.

This raises the point whether it is feasible, as many skeptics advocate, to exclude religious beliefs from their enquiries. In relation to matters of practical investigation, this is possible - although any contemporary claims of religious miracles must surely be examined? As skeptics, we advocate a rational, scientific basis for behaviour and where, along the path from theist deities to New Age prophets, do we choose to abandon our rationalism. But enough!

Le Poidevin ends his book with a chapter asking whether atheists should fear death. He does not believe that we exist in some disembodied form after death, but challenges our ordinary concept of time as 'flowing'. He puts forward the idea that past, present and future are equally real, in time, just as here and there are equally

real in space. As a consequence, death need no longer be seen as the passage into oblivion but, like birth, one of the temporal limits to our lives.

The author does not, unfortunately, tell us whether there is a sense in which, outside these temporal limits, we experience our lives. If so, we need to discuss the nature of that experience; if not, we are back to oblivion. Nor does De Poidevin add any structural detail to his concept of time, structure which might explain the apparent passage of time during 'life'. Likewise, the special theory of relativity is not considered; its relevance is most obvious in Minkowski's interpretation in terms of four-dimensional space-time. Especially relevant for the time structure problem seems to be the proven relativity of simultaneity for different observers.

This review, by its selectivity, compression and comment, no doubt distorts Le Poidevin's arguments - particularly the balance of his overall approach to the atheist/theist complex of problems. That balance can be restored by reading the book. Also, the last few paragraphs of the review have pointed out some areas needing more attention. The advocacy of belief in 'fictions', for example, needs a more detailed defence, and the author's concept of time requires a great deal of filling out. Subjects for further books? Let us hope so.

SCEPTICISM AND RELIGION

By Michael Heap

Michael Heap is a clinical psychologist and a lecturer in the Department of Psychology at the University of Sheffield. He is a member of the Steering Committee of ASKE

Should scepticism concern itself with religion? There are no good reasons why sceptics should not question those claims that are founded on religious beliefs and that may be tested by objective means. The literal interpretation of Genesis, historical accounts given

by the scriptures, moving statues and weeping icons, the Turin Shroud, faith healing, and communication with the dead are all candidates for sceptical enquiry. It is also sometimes appropriate to be sceptical about the motives of proselytisers and those whose claim to power is

legitimised by religion. And some sceptics are interested in logical arguments for the existence or otherwise of God.

I am a long-standing atheist because I have no reason to believe in a god. The religion that I know best is the one to which, until the age of 18 years I was almost daily exposed by mandatory instruction and worship, namely Christianity. I suspect that I understand Christianity better than some who profess to be true believers. I would not reject the Christian god simply because evil and suffering afflict both the faithful and the unfaithful, the innocent and the guilty, in equal and often appalling measure. Neither do I see a contradiction between devotion to that particular religious faith and adherence to the tenets of scepticism advocated by ASKE. Indeed, were I a committed Christian I would still hold to my sceptical positions, and I believe that the way scepticism addresses many current issues should appeal greatly to those of the Christian faith. There is a strong moral dimension to scepticism, namely that, in simple terms, people should not be told nor tell others things which are untrue or may well be so. No religious faith should require its devotees to accept what in any other context would be deception and dishonesty and it is unnecessary that the Christian faith, for one, demand such from its adherents.

Sceptics should acknowledge a basic human right, namely that people should be allowed the greatest freedom to arrive at their own understanding of their world and their lives. So long as we acknowledge that same right for others, then whatever understandings we each arrive at may be less important than our being allowed to do so without our being persecuted, derided, or otherwise treated disrespectfully.

Science and scepticism are concerned with how we interpret and understand the material world, the world available to our senses. They are concerned with establishing certain truths about that world, but there are other truths which we seek, towards which science can, at

the most, take us only part of the way, as with questions concerning morality, personal freedom and responsibility, and the meaning of our lives. Religious instruction offers the possibility of answers to such questions by reference to a moral authority separate from mankind but intimately involved with it (e.g. a divine creator). (I am avoiding here any discussion of secular approaches to these particular issues; I have, of course, like countless others, pursued my own.)

I confess to a lack of any great knowledge or command of my subject matter here, but I am reminded at this point of when, in our lessons at school, we would check the correctness of our solutions to, say, mathematical problems by reference to “the answers at the back of the book”, which were invariably taken as the final truth. I suppose one could make some equivalence to this and God. My understanding is that in science there are no corresponding “answers at the back of the book” to which we can ultimately refer.

In addition to the foregoing questions, religion offers explanations (i.e. the ‘how’ as well as the ‘why’) of the coming-into-existence of life and, indeed, the universe itself and here science and religion are seemingly incompatible. Again, I do not see this as a matter of *having* to choose between one and the other (though I choose only the one, namely science). My solution to this apparent incompatibility is as follows. Suppose that you are dreaming and in your dream you seek to establish all possible truths about your dream. When you awake, the truths you have discovered about your dream reality will no longer necessarily apply to the reality into which you have awoken. My own understanding of Christianity and, I presume, other religions is that they are telling us that there is a different reality into which we will eventually awaken from the world of our present existence, and the truths that we establish about the latter do not necessarily apply to the former. Hence there is no reason why the modern orthodox cosmologist should not also be devoutly religious.

THE POPE, EVOLUTION AND THE SOUL

By Mario Bunge

This article was first published in Free Inquiry (Winter 1996/97, 17(1)) and is reprinted with kind permission. A theoretical physicist by training, Mario Bunge is now the Frothingham Professor of Logic and Metaphysics at McGill University, Montreal. He is the author of more than four hundred articles and thirty-seven books on physics, metaphysics, semantics, epistemology, philosophy of science, ethics etc. His latest books are Finding Philosophy in Social Science (Yale University Press, 1996), Fundamentals of Biophilosophy (with Martin Mahner; Springer 1997) and Philosophy of Science (Transaction, 1998, 2 volumes). He is a Fellow of the Committee for the Investigation of Claims of the Paranormal (CSICOP) and recently served on the Editorial Advisory Board for the Encyclopedia of the Paranormal published in 1996 by Prometheus Books under the editorship of Gordon Stein.

John Paul II has recently admitted that biological evolution is for real. This is no news: Pius XII had admitted it in 1953. But he had warned that evolution, far from happening spontaneously (naturally), is guided from above. (How did he find out ?)

If evolution had been steered at a distance by God, then natural selection-one of the two main evolutionary mechanisms-would not be natural. it would be supernatural, hence mysterious and, therefore, a matter for theologians, not biologists. Clearly, the evolutionary biology authorised by the Vatican is not the one biologists work on.

The latest contribution of the present pope to the age-old religion-science debate consists in reiterating the dogma that the human soul is immaterial and eternal, so that it is free from the shackles of matter and the accidents of evolution. This millenary dogma poses a number of problems that theologians have not even tackled.

1. How is it possible for the human brain to have evolved without its specific functions having evolved as well? Do not the functions of an evolving thing change along with the thing itself? And has not biopsychology found that mental functions such as perception, attention, emotion, imagination, conjecturing, and decision-making are brain functions? If so, is it not obvious that mental functions are evolved with their organ , namely the brain? And is it not for this reason that evolutionary psychology is being cultivated?

2. if the mental processes are not neurophysiological processes, why is the human brain the most complex and vulnerable of all organs? If it did not discharge the most exquisite imaginable functions, why could we not manage with a far smaller and nearly empty skull, useful only for wearing a hat or butting a soccer ball?

3. If only the human mind is divine, how do the other primates, as well as many other higher vertebrates, manage to perceive, learn, and communicate, sometimes even with us?

4. If the human mind is divine, whom did the Holy Ghost endow with it, and at what stage in evolution? Was it the hominids three million years ago, or only *Homo sapiens*, that presumably emerged just 100,000 years ago? And before the miracle happened, were our remote ancestors soulless? If not, were they more soulless than the Crusaders, the Inquisitors, and the Christians who fought so fervently for the various fascist causes since 1925, and who continue to kill each other in Northern Ireland?

5. If the soul is alien to evolution, how can we explain that some of our mental activities are vastly superior to those of our remote ancestors? Could it not be because mental evolution has accompanied biological evolution?

These are not the only problems with mind-body dualism preached by theologians and philosophers who willfully ignore modern psychology. The most serious problem with that dogma is that it hinders the scientific investigation of mental processes, as well as of the medical treatment of mental disorders.

In fact, the pope has tacitly warned neurobiologists and psychologists that they should confine their study of the brain to its non-mental functions, as well as to abstain from studying apes, monkeys and other more or less remote relatives of ours in order to find out how the mind works. But these investigations are, precisely, those that have resulted in some of the most sensational findings over the past half a century.

For instance, thanks to the various imaging techniques, it is now possible to unveil the brain mechanisms of speech, reading and writing- surely some of the most outstanding mental activities.(Could divine grace be a substitute for positron emission tomography scanning and magnetic resonance imaging?)

Another example: the scarcity of serotonin, a key neurotransmitter, causes depression. This disabling disorder can now be treated with the famous drug Prozac which controls the concentration of serotonin by the brain, and thus restores its normal level. (Could prayer be an equally effective as well as a far less expensive technique?)

Moreover, it has been known for decades that iodine deficiency can cause not only goitre but also idiocy; that protein deficiency slows down learning; that a lesion in the parietal lobe may cause aphasia of some kind or other; that some forms of hyperactivity can be treated with drugs, and others by the surgical removal of a slice of the thyroid gland. (Can exorcism beat these feats?)

It has also been ascertained that the neocortex is the organ of intelligence, and the limbic system the organ of emotion; that the perceptions of color, shape, and movement are functions of so many distinct "areas" of the cortex; that knowing "what" is localized at a different place than knowing "where"; and so on and so forth. The curious reader can consult any modern textbook in physiological psychology- or psychobiology, or biopsychology, or neuropsychology. (Has theology helped in any way to make these discoveries?)

These and many other findings concerning the mind-body problem have lengthened enormously the list that the medical profession has been compiling for nearly three millennia. In fact, the ancient Egyptian and Greek physicians knew that certain brain lesions affect the mental functions. They also knew that certain drugs and beverages affect mood, others perception, and still others attention, memory, intelligence, or what have you. So much so, that today's mental health professional is tempted to prescribe a specific pill for nearly every mental disorder.

If the soul (or its secular version, the mind) were immaterial, it could not be affected, much less destroyed, with drinks or pills, surgery or beating. And if mental disorders were mere dysfunctions of a ghostly entity, they

could not be corrected with drugs or the lancet. We could perform spiritual exercises even while running or swimming vigorously. And lack of oxygen, as at great heights, would not diminish our mental faculties to the point of causing hallucinations, such as visions of flying saucers or apparitions of the Virgin Mary.

It is by treating the human brain as the organ of the human mind that psychological mechanisms, normal and pathological, are being unveiled. That is, the materialists approach taken by biopsychologists-as well as by physicists, chemists, and biologists-is the one that has been driving the quick advances of psychology and psychiatry over the past fifty years. (Incidentally, materialism in the broad sense does not deny the mental, in particular consciousness; it just holds that everything mental is neurophysiological, though not conversely.)

By contrast, the spiritualist (or idealist) approach, typical of religion, psychoanalysis, and idealist philosophy, obstructs the advancement of knowledge, and, therefore, that of the treatment of mental disorders. It is like trying to study movement without bodies, wind without air, digestion without the gut, heartbeat without the heart, and smiles without facial muscles. It is magic, not science.

Given the enormous price of ignorance and human suffering exacted by dogmatism, the pope's statement on evolution is a tragicomic rather than an amusing episode in the millenary warfare between science and religion. For those who suffer from depression, schizophrenia, epilepsy, aphasia, dyslexia, or any other mental disorder, it will not come as a consolation to learn that they should expect no help from research because God (or rather His Vicar) has uncoupled the soul from the brain.

Novelties do not come from mindless repetition of moth-eaten dogmas, but from free (though disciplined) search for truth. And all religions have opposed and will continue to oppose this search in the name of eternal revealed truths.

It is depressing that one should have to repeat such truisms, which were commonplace on the age of the Enlightenment, on the eve of the third millennium. Is it because we are not progressing as much as they say or rather is it precisely because we are running so fast that the guardians of dogma attempt to erect barriers to the advancement of the most glamorous science, the one

that is uncovering the brain mechanisms of the mind and thus laying finally to rest the dogma of the immaterial and immortal soul? As Don Quixote once said: "They bark, Sancho; a signal that we are advancing."

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THE CASE AGAINST IMMORTALITY

by Keith Augustine

This article was first published in Skeptic (1997, 5(2)), the journal of the Skeptics Society of Altadena, California, and is reprinted with kind permission. Keith Augustine is a senior philosophy major at the University of Maryland, College Park, where he serves as Secretary of the Atheist Students Association. He is also Secretary of Campus Freethought Alliance and a member of the Internet Infidels, the maintainers of the Secular web <<http://www.infidels.org/>>.

Is there life after death? Given the personal realization that we are all mortal, this is arguably one of the most important questions anyone can ask; and it has presumably been asked for as long as humans have asked questions. Immortality - the belief that there is life after death - is a complex issue, dependent on several other philosophical questions, beginning with a basic definition. Corliss Lamont defines immortality as (1990, 22):

"the literal survival of the individual human personality or consciousness for an indefinite period after (physical) death, with its memory and awareness of self-identity essentially intact."

An essential distinction must be drawn between survival of bodily death and immortality. Survival only implies the continued existence of personality after the physical death of the body without specifying whether that existence is eternal or eventually leads to annihilation (Edwards, 1992,2). In this essay I will not be addressing arguments that attempt to prove the indestructibility and hence immortality of the soul (e.g., Plato), or potential problems with the notion of eternal existence. Nor will I discuss ethical arguments that attempt to establish immortality as a necessary consequence of the benevolence of an omnipotent God. Instead, I will examine the logical possibility of and evidence for or against survival of bodily death, since that is what most people care about. Arguments for survival establish nothing in favour of immortality; arguments against

survival, however, are arguments against immortality. In other words, immortality presupposes the possibility of survival. This also means that any evidence derived from parapsychology serves only as evidence for survival.

There are two fundamental answers to the question of immortality: (1). The survival hypothesis asserts that the human personality completely and permanently ceases to exist after the death of the body. (2) The extinction hypothesis contends that the human personality completely and *permanently* ceases to exist after the death of the body. This distinction may seem redundant and obvious, but the necessity of this precise definition will become clear when we analyze survival theories which invoke *temporary* extinction. I will also assume that the burden of proof falls on the survival hypothesis because in our daily lives we know of the existence of personality only in association with the living physical organism; that is, conclusive evidence for the continued existence of personality after the death of the physical body does not exist for any of the views I will analyze. (If such evidence did exist there would be no debate.)

Another important distinction is that between personal and impersonal forms of survival. Personal survival contends that people survive bodily death as distinct individuals. An example of impersonal survival is the Buddhist belief in nirvana as a kind of Absolute Mind that individual lives merge or are absorbed into when enlightenment is fully realized (Edwards, 2-3). I will focus exclusively on personal survival.

Three "vehicles" for survival of the personality after the death of the body will be considered: the disembodied mind, the astral body and resurrection. These vehicles can be involved either alone or in combination. A *disembodied mind* is an immaterial, nonspatial substance which constitutes a person's mental states - a "soul." The *astral body* is a form of exotic matter, for in its most fundamental sense it refers to a spatial entity which has physical characteristics such as shape, size and spatial position. These criteria must be met in order to distinguish the the astral body from the disembodied mind. The astral body is consequently detectable in principle, but extremely difficult to detect in practice - otherwise it would be noticed leaving the body at death or perhaps during out-of-body experiences. The astral body can also be specifically envisioned as mirroring the physical body's features.

Resurrection of the body is an overt miracle from god in the Judeo-Christian and Islamic tradition that presupposes the truth of traditional monotheism. Thus, as Kai Nielsen (1989, 2) points out, "if the grounds for believing in God are scant the grounds for believing in bodily resurrection are doubly scant." This argument is relevant because arguments against the existence of God are decisive arguments against resurrection. To isolate resurrection as a vehicle for survival, I will assume a version of resurrection which posits the extinction of personality at death and its re-creation with the resurrection of the body. Resurrection can be conceived of in two forms: the literal resurrection of the decayed corpse, or the creation of a new body or "replica." It should be noted that there can be no empirical evidence in support of resurrection if it is taken to be future event on Earth or an event that takes place in another world.

Immortality is related to the mind-body problem and the problem of personal identity. The mind-body problem is concerned with how mind and body are related to each other. Many theories have been proposed to solve the mind-body problem. Modern materialism contends that mental states are reducible to physical brain states. If materialism is true, then, survival in the form of disembodied minds or astral bodies is impossible. Epiphenomenalism, which contends that the mind is a separate yet dependent by-product of the brain, has the same implications for survival. Resurrection, however, is consistent with either of these theories of mind. A dualism

that contends that mind is a separate, independent entity from the brain is a necessary presupposition for the possibility of disembodied minds or astral bodies (Edwards, 292). Resurrection is consistent with dualism if it is coupled with the notion of a soul which constitutes personality and thus does not extinguish with the body at death but continues to exist and is later rejoined to a resurrected body (Flew, 1984, 108). Personal identity is concerned with what makes a person the same person over time. Personal identity problems arise in the context of specific arguments about the logical possibility of immortality.

The philosophical case against immortality

The issue of immortality has primarily been discussed by philosophers, so we begin here before looking at the scientific evidence. Logical arguments, if valid, are decisive; thus, not even an appeal to faith could vindicate a belief that is incoherent because no one would understand what it is that he claims to believe. The conceptual problems that plague the notions of disembodied minds, astral bodies and resurrection serve to support the extinction hypothesis. Here's why.

The belief in survival in the form of disembodied minds contends that people possess an immaterial, nonspatial substance which constitutes personality. One objection to this view, that human beings are essentially corporeal, is stated by Corliss Lamont (46):

"If we carefully examine their accounts, we find that....they actually provide this spirit with a body...[T]heir descriptions give to it activities, functions, and environments usually pertaining to earthly existence and natural bodies. The immortal personality...enjoys and suffers a great many experiences that would be impossible without the cooperation of...the body.

Gardner Murphy makes this point when he asks us "to try...to imagine what his personal existence would be like if he were deprived of every device for making contact with his environment" (Edwards, 47). Antony Flew gives an excellent example of our corporeal nature:

"Consider...how you would teach the meaning of any person word to a child. This is done...by some sort of direct or indirect pointing at members of that very special

class of living physical objects to which we one and all belong." (Flew, 111).

John Hospers punctuates this point when he notes: "Your body seems to be involved in every activity we try to describe even though we have tried to imagine existing without it" (Hospers, 1922, 280).

So even if you conceded the possibility of disembodied existence, you would still have to justify the identification of the disembodied spirit with the previously "flesh and blood" person. C.D. Broad points out that this is impossible (1992, 278):

"If I cannot clearly conceive what it would be like to be an unembodied person, I find it almost incredible that the experiences of such a person...could be sufficiently continuous with those had in his lifetime by any deceased human being as to constitute together the experiences of one and the same person."

Many philosophers have argued that bodily continuity is more essential to personal identity than memory because memory claims can be real or false; memory in itself is not enough to make you the same person over time - bodily continuity is *required* (Edwards, 48-49).

Another problem for disembodied minds is the problem of individuation, that is, how do we distinguish mind A from mind B? The answer is spatial location of their bodies. It is impossible to conceive how two minds could be distinguished otherwise if we add the further condition that these minds be identical in thought content, which is logically possible.

By contrast, astral body theories attempt to "portray an immortality in terms of a visual image of the body that is entirely dissociated from the tactile image, to preserve the form of the earthly body without its solidity" (Lamont, 48). This is, in fact, the kind of immortality most people envision. This view tends to reinforce the argument that humans are essentially corporeal since it defines astral bodies by their relation to physical bodies, as Lamont noted (49):

"Does not this view...avoid the dilemma we have been describing? It does, but only to confirm quite clearly our central argument. For as soon as our death-conquering spirit becomes itself a material thing, it then and there

receives a body...Thus the essential unity of the body-personality is again demonstrated."

The critical problem, says Flew, is: "obviously to find some positive characterization for an astral body" (117). That is, if we are to begin to take the notion of astral bodies seriously, we are going to need some positive criteria for what is to be an astral body rather than a contrast between it and disembodied minds or normal physical bodies.

One absurdity of astral body theories is that astral bodies would require an entire astral plane, which conventionally functions exactly like the physical world. Would we need astral clothes? Astral shoes? Another problem is synchronization. The astral body is supposed to be an exact duplicate of the physical body. Thus, for every physical action there is a corresponding astral action. As Paul Edwards points out, "all events in a person's life [involve] physical contact...[but] the astral body cannot touch or be touched by another body" (22), Edwards puts the final nail in the coffin for a version of astral body theories when he observes (22):

"If the astral body is an exact duplicate of the regular body it must die along with the regular body... If the secular body died as result of a brain tumor or as the result of being shot through the heart, the astral brain and astral heart must have been similarly injured."

There are no conceptual difficulties, however, with a modified theory of astral bodies. It is not necessary for astral bodies to mirror physical bodies exactly; the minimum required characterization for astral bodies is that they have some physical characteristics such as shape, size and spatial position. A minimum characterization, however, hardly provides a plausible account. A specific positive characterization is required for a credible theory. Of what exotic matter is the astral body constituted? Why does the astral body remain undetected? How does the astral body function?

Finally we come to resurrection. Literal resurrection of the decayed corpse faces a single insuperable difficulty: how are the constituent parts of a long-decayed corpse that have been absorbed into other human beings going to be reconstituted along with the other people who share the same matter? cannibalism presents the most graphic example of this problem, but

long-term decay and recycling of matter are equally troublesome.

Alternative forms of resurrection invoke the creation of a new body that is not materially continuous with the old. Flew immediately objects: "Thus to produce even the most indistinguishably object after the first one has been totally destroyed and disappeared is to produce not the same object again, but a replica" (107). Peter Van Inwagen argues that this objection is even valid in regard to literal resurrection. He urges us to imagine a manuscript that was written by St. Augustine, burned by Ariens in 457, and miraculously recreated by God in 458. Van Inwagen contends (243):

The manuscript God creates...is not the manuscript that was destroyed, since the various atoms that compose the tracings of ink on its surface occupy their present positions not as a result of Augustine's but of God's.

He also uses the analogy of a house of blocks built by a child. If the mother accidentally knocks down the house and rebuilds it in the same configuration the blocks originally were in, the resulting house would not be the house of blocks built by the child, but by the mother.

It could be argued that whether or not the replica can be identified with the original person is a matter of definition, and I agree. The "replica objection" argues that someone's being *me* should be a fact that is independent of the existence of any other people. In other words, since the replica would not be me *if* it existed and had not died, there is no room for calling the replica me after the dissolution of my original body. This assumption, however, is invalid. Van Inwagen seems to be playing linguistic games when he argues that reconstituting the person from the same matter would be a replica. The manuscript God creates has the same causal history as St. Augustine's manuscript since they are materially continuous with each other, thus they are the same manuscript. That a replica is materially continuous with the original person indicates identity, but bodily continuity is not necessary for personal identity.

By way of analogy, if I have my car repaired and every single part is gradually replaced, is the resulting car the same car? Indeed it is. If every single part was disassembled and at some later date the car was reassembled completely from different parts, but with the

same exact material and quality and in the same exact configuration as the original, the resulting car would be the same car. It is the same car because the closest continuer of the original (see Nozick, 1991). If the original exists and an exact replica is created, then the original would be the closest continuer and the replica would not be the same car. That the original is destroyed *does* matter. If my body dies and a replica is created, there is room for calling it me; if my body lives and a replica is created, there is no room for calling it me. Thus the replica objection to resurrection is invalid.

Another problem for survival in any form is the age regression problem, stated by W. T. Stace (in Edwards, 60):

When an old man dies, what kind of consciousness is supposed to survive? Is it his consciousness as it was just before death, which may perhaps have become imbecile? Or is it the consciousness of his mature middle age? Or is it the infant mind that he had when he was a baby? The point of these questions is not that we do not know the answers...The point is that all possible answers are equally senseless...[W]ill the old man who dies suddenly revert to his middle years after death? And will the infant who dies suddenly mature?

The conceptual problems for the three common vehicles for survival make survival a highly implausible possibility. Disembodied existence is inconceivable, astral bodies are too ill-defined or undefined to warrant their acceptance, and literal resurrection cannot account for the fact that many people who have shared the same matter cannot all be resurrected of that matter. There are no logical problems for the prospect of a resurrection replica, but, given our past experience, resurrection is an extremely unlikely prospect for the future.

The scientific case against immortality

Modern science demonstrates the dependence of consciousness on the brain, implying that the mind must die with the body. This conclusion is emotionally difficult to accept. Dylan Thomas forcefully expresses the animosity that many of us feel toward the prospect of our inevitable extinction: "Do not go gentle into that good night. Rage, rage against the dying of the light" (Lamont, 211). Bertrand Russell comes to a different conclusion: "I should scorn to shiver with terror at

the thought of annihilation. Happiness is nonetheless true happiness because it must come to an end, not do thought and love lose their value because they are not everlasting" (Edwards, vi)

I must admit that, when confronted by the death of someone close to me, or contemplating my own death, I am not comforted by such words of wisdom. Nevertheless, we cannot base our beliefs on what we *want* to be true; the truth can only be found by weighing the evidence for or against a given idea. In the case of immortality, the extinction hypothesis is supported by *strong* and *introntivertibe* evidence from the hard experimental data of physiological psychology, whereas the survival hypothesis is at best supported by *weak* and *questionable* data from parapsychology.

The rallying cry of many parapsychologists is that they have discovered indisputable evidence for paranormal, or "psi" phenomena which cannot be explained by scientists; such evidence is therefore ignored or denied by scientists on purely dogmatic grounds because psi does not fit their preconceived notions and prejudices. Parapsychologists often speak of a forthcoming scientific revolution comparable to Copernicus' discovery that the sun is the centre of the solar system. Flew argues that the charges of *a priori* dogmatism are unjustified (138 - 139):

It is simply grotesque to complain, in the absence of such decisive falsifying evidence, that these appeals to...the named laws of established physics are exercises in a priori dogmatism. For what "a priori" means is: prior to and independent of experience. But in...these kinds of cases we have an enormous mass of experience supporting our present beliefs and our present incredulities.

There is no basis for the conclusion that parapsychology is going to lead to some kind of scientific revolution. Historical figures like Copernicus and Darwin painstakingly amassed many different types of solid evidence to support their theories; Einstein's predictions from relativity were based on a scientific theory and subsequently verified by experiment. Yet, when we analyze parapsychology, we find no such hints of a forthcoming revolution. A study by the National Research Council in 1988, published as *Enhancing Human Performance*, surveyed many areas of research to determine how to improve individual and group

performance (Frazier 1991, 150) The report's section on "Paranormal Phenomena" concluded: "The committee finds no scientific justification from research conducted over a period of 130 years for the existence of parapsychological phenomena" (Frazier, 151). Finally, parapsychologists offer no positive criteria for what kind of event should be categorized as an instance of paranormal phenomena. As Flew puts it, "all psi terms refer rather to the absence of any means or mechanism, or at any rate the absence of any normal and understood means" (140).

Clearly, while parapsychological evidence *in general* is wanting, we must evaluate parapsychological evidence directly cited to be most consistent with survival. Reports of apparitions can be explained in terms of hoaxes or hallucinations. Photographic evidence for apparitions is dubious because ghosts tend to look remarkably like double exposures. And we should be weary of ghost sightings which typically occur at night, while we are asleep or just falling asleep. Finally, the fact that apparitions "rarely communicated any important information" suggests apparition experience are hallucinatory (Beloff, 1992, 261).

So called out-of-body experiences (OBEs) are also offered as parapsychological evidence for survival. The former parapsychologist Susan Blackmore sums up the results of investigations into OBEs: "There is no real evidence for psi in OBEs, there is no evidence for anything leaving the body, and there is no evidence of effects caused by out-of-body person" (Blackmore, 1991, 132). Experiments designed to detect a double during OBEs have yielded negative results: "The size of any effect detected has decreased with increasing experimental sophistication. Most recent studies have used magnetometers, thermistors, ultraviolet and infra-red detectors and so on...but no reliable detector has yet been found" (Blackmore, 1987, 572).

Parapsychologists "have been used animals and human 'detectors,' but no one has yet succeeded in detecting anything reliably" (Blackmore, 1991a, 38). Another type of experiment was designed to determine if OBE subjects can retrieve information from a remote location. Blackmore concludes (1987, 572):

The experimental evidence is weak. Subjects have been asked to view target letters, numbers or pictures, placed in

distant rooms...[and] other studies have tried to discover whether subjects seem to be looking from specific location during OBEs; however, the results have been inconclusive. Generally these studies provide very mixed results and it is not clear that any paranormal process is involved.

The evidence, says Blackmore, is more consistent with a psychological model of OBEs: "If sensory input is reduced or disrupted, the normal input-based model of the world may start to become unstable and break down. In this case the cognitive system will try to get back to normal by creating a new model of the world from imagination...[from] a bird's-eye view, as though from above" (1987, 573). According to this model, "if the OBE occurs when the normal model of reality is replaced by a bird's-eye view constructed from memory, then people who have OBEs should be better able to use such views in memory and imagery." Blackmore conducted some experiments and found that "OBEs were better at switching viewpoints, were especially good at imagining scenes from a position above their heads, and were more likely to recall dreams in a bird's-eye perspective" (1991, 133).

Other phenomena often cited as evidence for survival are near-death experiences or NDEs. Survival proponents argue that because the core features of NDEs are almost invariably reported by experiencers, NDEs constitute evidence for an objective afterlife reality. However, these core features can be explained by physiological models because the same brain processes occur at the onset of dying (e.g. oxygen-deprivation, endorphin release, and random neural firing) in those who undergo NDEs, thus their subjective experiences should be similar (Blackmore, 1993, 261).

Another argument is that NDEs are real because they *feel* real, but this does not constitute evidence that NDEs reflect an external reality anymore than the fact that hallucinations feel real constitutes evidence that they are real. Some researchers claim that information has been obtained in NDEs by means other than sensory perception, but there is no evidence for this. Madeline Lawrence (1997) designed an information retrieval experiment where an electronic screen placed in the cardiac rehabilitation ward in Hartford Hospital, Connecticut, displayed a sentence that was changed every day that could be seen from the vantage of a

patient or the staff. When someone had a NDE, all they had to do is repeat what the sentence said: then the staff could report what the NDEr said and determine if there was a match. The results produced no evidence that anyone could retrieve information from remote location during an NDE.

The accuracy of descriptions of the environment in NDEs may be based on semiconscious perceptions of the environment prior to the breakdown of perception which are incorporated into hallucinatory imagery during NDEs. There is no corroboration for claims of perception outside of the immediate environment of the patient or accurate perception of NDEs by the blind, thus the paranormal argument does not constitute evidence for survival (Blackmore 1993, 128-133). Finally, the fact that people undergo positive personality transformations after NDEs does not indicate a mystical experience of an afterlife. A study conducted by Kenneth Ring found that personality transformations occurred in people who came medically close to death regardless of whether or not they experienced an NDE, suggesting that the transformation resulted from facing death rather than an NDE (1989, 248-249). Some findings of NDE research are more consistent with physiological and psychological models:

- (1) NDEs occur in only one-third of all cases where there is a near-death crisis (Ring, 194).
- (2) The details of NDEs depend on the individual's personal and cultural background (Ring, 195).
- (3) Physiological and psychological factors affect the content of the NDE. Noises, tunnels, bright lights, and other beings are more common in physiological conditions directly affecting the brain state, such as cardiac arrest and anaesthesia, whereas euphoria, mystical feelings, life review, and positive transformation can occur when people simply believe they are going to die (Blackmore, 1993, 44-45).
- (4) The core features of NDEs have been found in drug-induced and naturally occurring hallucinations (Siegel, 1981, 174). For example, the OBE can be induced by the anesthetic

ketamine (Blackmore, 1993, 170); a tunnel experience is a common form of psychedelic hallucination (Siegel, 1981, 175-176); and all NDE stages have occurred in sequence under the influence of hashish (Blackmore, 1993, 42-3).

(5) Build-up of carbon-dioxide in the brain will induce NDEs (Blackmore, 1993, 53-4).

(6) The panoramic life review closely resembles a form of temporal lobe epilepsy. There are even cases where epileptics have had OBEs or even seen apparitions of dead friends and relatives during their seizures (Blackmore, 1993, 206).

(7) Computer simulations of random neural firing based on eye-brain mapping of the visual cortex have produced the tunnel and light characteristic of NDEs (Blackmore, 1993, 84).

(8) The fact that naloxone-an opiate antagonist that inhibits the effects of endorphins on the brain-terminates near-death experiences provides some confirmation for the endorphin theory of NDEs, as Saavedra-Aguilar and Gomez-Jeria demonstrated (1989, 210-211): "Within a minute [after being injected with naloxone] he awoke in an agitated state, and later reported an NDE-like experience that apparently was interrupted by the naloxone, suggesting that the experience may have been mediated by opiod peptides."

(9) NDEs can be induced by direct electrical stimulation of brain areas surrounding the Sylvian fissure in the right temporal lobe (Morse, 1990, 104)

Other findings are flatly inconsistent with survival. The tunnels described in NDEs vary considerably in precise form. If NDEs reflected an external reality, one would expect consistency in the form of tunnel experiences reported. Furthermore, NDE cases have been reported where the patient has identified the "beings of light" as the medical staff making resuscitation attempts (Blackmore, 1993, 227). Finally, the fact that

"children are more likely to see living friends than those who have died" in NDEs strongly suggests that NDEs are not experiences of an external afterlife reality (Blackmore, 1991b, 36).

Past-life memories are also offered as evidence for survival, and particularly for reincarnation. Parapsychologists accumulate evidence of people providing accurate historical details when they describe "memories" of "past lives" while under hypnosis. This evidence, however, is more consistent with an alternative explanation: cryptomnesia, as described by Melvyn Harris (1986, 19):

To understand cryptomnesia we must think of the subconscious mind as a vast, muddled storehouse of information. This information comes from books, newspapers, and magazines; from lectures, television, and radio; from direct observation and even from overheard scraps of conversation. Under normal circumstances most of this knowledge is not subject to recall, but sometimes these deeply buried memories are spontaneously revived. They may reemerge in a baffling form, since their origins are completely forgotten.

Another form of past-life memories does not involve hypnotic regression. "Memories" of previous lives spontaneously occur during waking life in cases investigated in India by Ian Stevenson. Stevenson collected cases where children generally between two and four years old began talking about their "previous lives" and even their previous death. Usually the memories are gone by age eight. In several cases, the persons the children claims to be in a previous life did in fact exist and many descriptions given were accurate (Edwards, 1992, 11). Stevenson dismissed the possibility of fraud because he saw no motive for it. In one case a boy wanted a third of his "past-life father's" land (12). Stevenson hired the lawyer Champe Tansom to analyze some cases. Ransom concluded (14):

Stevenson's cases then do not amount to even half-way decent evidence. In only 11 of the approximately 1,111 rebirth cases had there been no contact between the two families before an investigation had begun. Of these 11, seven were seriously flawed in some respect. What this means is that in the great majority of cases, the two families had met years before a scientific investigation began, and that the likelihood of independent testimony

was quite small. The rebirth cases are anecdotal evidence of the weakest sort.

Mediums are often cited as evidence for survival; however, most material of this sort is dubious. To quote Peter Geach (1992, 231): "There are cases, as well-authenticated as any, in which the medium convincingly enacted the part of X and told things that 'Only X could have known' when X was in fact alive and normally conscious."

In all these cases, it is important to realize that alternative explanations do not have to be proven. Rather, if certain phenomena are to be considered indicative of survival, survival must be shown to be the only consistent hypothesis capable of explaining the evidence. While the parapsychological evidence for survival is insufficient, the physiological evidence is more than sufficient. Barry Beyerstein points out that the view "that consciousness is inseparable from the functioning of the individual brains remains the cornerstone of physiological psychology². This is due he says, to "the theory's parsimony and research productivity, the range of phenomena accounted for, and the lack of credible counter-evidence" (Beyerstein, 1991, 45).

Beyerstein lists five main types of empirical evidence which support the dependence of consciousness on the brain. *First*, phylogentic evidence refers to the evolutionary relationship between the complexity of the brain and a species' cognitive traits. *Second*, the developmental evidence for mind-brain dependence is that mental abilities emerge with the development of the brain; failure in brain development prevents mental development. *Third*, clinical evidence consists of cases of brain damage that result from accidents, toxins, diseases, and malnutrition that often result in irreversible loss of mental functioning. If the mind could exist independently of the brain, why couldn't the mind compensate for lost faculties when brain cells die after brain damage? *Fourth*, the strongest empirical evidence for mind-brain dependence is derived from the experiments of neuroscience. Mental states are correlated with brain states; electrical or chemical stimulation of the human brain invokes perceptions, memories, desires, and other mental states. *Finally*, the experiential evidence for mind-brain dependence consists

of the effects of several different types of drugs which predictably affect mental states (Beyerstein, 45).

Further experimental evidence for mind-brain dependence is derived from "split-brain" patients who have undergone an operation that severs the corpus callosum to reduce epileptic seizures. The corpus callosum is a broad band of fibres that directly connects the left and right hemispheres of the neocortex. If information is presented to only one hemisphere of a "split-brain" patient, the other hemisphere is unaware of it and is not capable of understanding the reactions of the informed hemisphere. The result of "split-brain" surgery is the formation of two mental systems, each with independent mental attributes. A variety of psychological tests corroborate the existence of two streams of consciousness demonstrably unaware of the contents of the other. Beyerstein asks: "if a 'free-floating' mind exists, why can't maintain unity between the disconnected spheres?" (46). To give a humorous example, "one of the patients complained that sometimes, when he embraced his wife, his left hand pushed here away" (Parfit, 1991, 249).

One of the strongest arguments for mind-brain dependence comes from implants of "brain pacemakers" which electrically stimulate the cerebellum in the brains of psychotics. The following true story illustrates the point: "Another patient, a severely depressed former physicist, was troubled by voices that commanded him to choke his wife. When he got one of Dr. Heath's pacemaker's in 1977, the infernal voices vanished, along with his perennial gloom...But his wires eventually broke, and once again his wife was threatened with strangulation. When the gadgetry was mended, so was the man's psyche" (Hooper and Teresi, 1992, 155).

These are just a few examples from neuroscience of the dependence of consciousness on the brain. we know that altering the brain's chemistry can cause drastic personality changes. Schizophrenia and Alzheimer's disease are dramatic examples of mind-brain dependence. If you are thinking of suicide, don't go to a psychiatrist, go to a pharmacologist: according to Hooper and Teresi, a combination of an antidepressant and tryptophan should banish all thoughts of ending your life.

Survival proponents who think that the brain is an instrument of the soul use arguments like the following (Lamont, 98):

A colored glass...[has] only a transmissive function in respect of the light that shines through [it], since [it does not itself] create the rays. The same may be said of an organ, which transforms already existing air into music. In a similar fashion the human body may act as a transmission apparatus for the supernatural soul.

Corliss Lamont makes it apparent that this rejoinder has no force (100):

A severe injury to the head, for instance, may change an ordinarily cheerful man into a sullen and morose one subject to sudden fits of homicidal mania. If the brain and body are simply the instruments of the soul, we have to say in such a case that this personality is really still brimming over with joy and benevolence, but that unfortunately these sentiments can only express themselves in dark glances, in peevish complaints and in violent attacks.

The illustrations of the "instrument theory", says Lamont, reveal a fatal flaw (102):

If the human body corresponds to a colored glass...then the living personality corresponds to the colored light that is the result of the glass...Now while light in general will continue to exist without the colored glass...the specific red or blue or yellow rays that the glass produces...will certainly not persist if the glass [is] destroyed.

Paul Edwards (1992, 296) argues that the instrument theory is inconsistent with Alzheimer's disease: "An Alzheimer patient's brain is severally damaged and most of his mind has disappeared. After its death his brain is not merely damaged but completely destroyed. It is surely logical to conclude that now his mind is also gone." Edwards provides a clear illustration of the incompatibility of the instrument theory with the facts of Alzheimer's disease. Prior to her affliction with Alzheimer's, "Mrs. D" was a considerate, compassionate person with a normal functioning mind. Yet,

At about the time when she could no longer recognize her daughter, she beat up [a] paralyzed lady on two or three occasions...[The instrument theory] implies that throughout her affliction with Alzheimer's Mrs D's mind was intact. She recognized her daughter but had lost the ability to

express this recognition. She had no wish to beat up an inoffensive paralyzed old woman. On the contrary, 'inside' she was the same considerate person as before the onset of the illness. It is simply that her brain disease prevented her from acting in accordance with her true emotions...[T]hese are the implications of the theory that the brain is only an instrument for communication. Surely these consequences are absurd (299-300)

There is a consensus among the overwhelming majority of neuroscientists that the dependence of consciousness on the brain has been established by scientific research. Furthermore, even with parapsychology we find few parapsychologists who believe that psi is indicative of survival of bodily death. A 1980 Parapsychological Association survey found that only 11% of the professional US and Canadian parapsychologists believed that survival after death had been positively or probably demonstrated (Frazier, 1981, 3). John Beloff (1987, 586) states that "It should be thought...that all parapsychologists are necessarily committed to a dualist interpretation of the mind-body relationship. At the present time especially, many exponents prefer to think of psi as essentially a function of the brain, or of some special brain mechanism or process."

In other words, even parapsychologists accept the dependence of consciousness of the brain! This leaves the survival hypothesis in an awkward position, since paranormal phenomena are the best source of evidence that survival proponents have to offer. Even if one is inclined to believe that paranormal phenomena are best explained in terms of survival, the existence of such phenomena is doubtful because "a century after the founding of the Society for Psychical Research, there is still a total lack of consensus regarding the actuality of any parapsychological phenomena" (Beloff, 1987, 586). According to Christopher Scott (1987, 579):

With the single exception of hypnosis, not even the existence of one of the phenomena originally claimed as supernatural, or later as paranormal, has achieved general acceptance among the scientific community; not one demonstrable, or repeatable, paranormal effect has been discovered; not one characteristic or law has been found which turns up in all those experiments that claim a positive result.

In weighing the evidence on both sides of this issue the scales are clearly tipped in favour of extinction. Given this conclusion, rather than take Unamuno's position and "fight against destiny, even though with hope of victory," we should not allow our emotions to cloud our judgement. As Corliss Lamont says, "we do not ask to be born; amid we do not ask to die. But born we are and die we must. We come into existence and we pass out of existence. And in neither case does high-handed fate await our ratification of its decree" (278).

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CONFERENCE REPORT

The Psychology of Paranormal Belief and Experience

By Dr. Christopher French

Dr. Christopher French is Head of the Department of Psychology at Goldsmiths College, University of London. He has published a number of articles on the paranormal, including the oft-cited Factors Underlying Belief in the Paranormal: Do Sheep and Goats Think Differently? The Psychologist (1992), 5, 295-99. He is a member of ASKE.

A symposium dealing with the above, entitled *Out of this World - Studies of Paranormal Beliefs*, was organized as part of the Fifth European Congress of Psychology held in Dublin from July 6th to July 11th, 1997. The conference overall was something of a disappointment according to many delegates. Attendance at the presentations was often poor with even the presenters frequently failing to turn up! Fortunately, this was not the case with regard to the symposium on paranormal belief and experience (even though it was scheduled into one of the traditional graveyard slots of Friday afternoon when many delegates would normally be setting out for their journey home). There was a very good turn-out and, judging from the lively question-and-answer sessions, the presentations sparked considerable interest.

One particularly positive feature of the symposium was the range of views represented by the presenters from sceptic to believer. The opportunity to exchange views and ideas over a pint of Guinness and to relax in the traditional hospitality of Dublin made the trip well worth it.

A summary of the symposium and abstracts of the presentations are presented below.

Summary of Symposium

The theme of this symposium is the psychology of paranormal belief and experience. Lawrence presents confirmation of the link between childhood trauma, fantasy and paranormal beliefs. Williams' paper explores the connection between paranormal belief and measures of experiential thinking. Roe and Mendel's paper is a critique of the idea that believers in the paranormal are cognitively inferior to non-believers. French and Blackmore investigated the possible link between paranormal belief and the tendency to think stereotypically. Wiseman, Harvey and Smith investigated the effect of a sceptical commentary on viewers' assessments of a TV programme's treatment of a potentially paranormal event.

Abstracts

EXTENDING AND CONFIRMING CHILDHOOD CAUSES OF PARANORMAL BELIEF AND EXPERIENCE

Lawrence, Tony

School of Health and Social Sciences, Coventry University Coventry UK

In this presentation I report the results of new studies confirming and extending Lawrence et al.'s (1995) childhood factors model of paranormal belief and experience. A household survey of 300 people living in Edinburgh produced 131 suitable responses. Participants completed a 256-item questionnaire pertaining to 13 different psychological variables. The following variables are pertinent to this presentation: paranormal belief, paranormal experience, childhood trauma, parental encouragement of fantasy, childhood fantasy. Confirmatory tests of the Lawrence et al. (1995) childhood factors model showed that it still remained an excellent fit to the data in this new sample, and also confirmed its superiority over Irwin's (1992) original model. In addition, Lawrence et al. (1995) predicted that there were two routes from childhood trauma to paranormal experience, one direct and one mediated by childhood fantasy. Separate confirmatory analyses lend moderate support to this view, especially supporting Lawrence's notion that the fantasy route is influenced largely by control-related trauma. The import of these new results is assessed, and their value in explaining other areas of research into paranormal belief is discussed.

*THE WANDERING MIND: THE RELATIONSHIP
BETWEEN AN EXPERIENTIAL COGNITIVE STYLE AND
PARANORMAL BELIEF*

Williams, Carl

Psychology Department, Liverpool Hope University
College Liverpool UK

Robust relationships have been demonstrated between paranormal belief and factors which are associated with imaginative tendencies (e.g., absorption, fantasy proneness, and creativity). These tendencies may be considered as specific examples of experiential thinking. Experiential thinking (which is characterised as rapid, automatic, emotional, holistic and concrete) is discussed with reference to Epstein's (1994) cognitive-experiential self theory, and also Gelernter's (1994) notion of a low- versus high-focus thought continuum; and consideration is given to how these ideas may be useful in understanding the origins of paranormal belief. Verbal accounts provided by individuals who report experience of and belief in the paranormal are presented as suggestive evidence for interpreting paranormal belief as an outcome of experiential modes of cognition.

BELIEF IN THE PARANORMAL AND THE COGNITIVE DEFICITS HYPOTHESIS

Roe, Chris A. (1) and Mendel, L. (2),

(1) Nene College of Higher Education Northampton, UK
(2) Bolton Institute of Higher Education, Bolton, UK

A number of attempts have been made to characterise believers in the paranormal as being cognitively or perceptually inferior to disbelievers. A concerted effort to map such differences may reflect a general belief that we can account for parapsychological experiences in terms of characteristics of the experiencers and can thus forego having to consider the claims themselves. Irwin (1993) has coined the term 'cognitive deficits hypothesis' to describe this general philosophy. Purported deficits have been related to performance in a number of domains including general educational attainment (Messer & Griggs, 1989), science education (Otis & Alcock, 1982), performance on intelligence tests (Smith, Foster & Stovin, 1995), accuracy in probability judgements (Blackmore & Troscianko, 1985), reasoning skills (Alcock & Otis, 1980), and perceptual ability (Wiseman & Smith, 1994). However, the evidence in each case is far from compelling (Blackmore, 1994; Irwin, 1993) and has recently come under sustained criticism (e.g. Irwin 1991; Roe, 1995). In this paper we will consider the consequences of the fact that much of the affirming research has been conducted by sceptics whereas parapsychologists' attempts to replicate have generally been unsuccessful. This review will include details of two previously unreported studies.

POPULATION STEREOTYPES AND PARANORMAL BELIEF

French, Christopher C. (1) and Blackmore, Susan (2)

(1) Department of Psychology, Goldsmiths' College, University of London London UK (2) School of Psychology, University of the West of England Bristol UK

One situation which is commonly misinterpreted as involving telepathy exploits the tendency of subjects to prefer some responses over others in an ostensibly free-choice situation. For example, an alleged psychic might ask subjects to telepathically pick up a number between 1 and 10 which the psychic claims to be "transmitting." The most popular choice will usually be "7" and the "psychic" can give the appearance of psychic powers by claiming that this was the number which was "transmitted." Results are presented of two studies which attempted to assess whether the tendency to choose a particular response stereotype was correlated with belief in telepathy. An initial pilot study (n=135) produced the expected pattern of stereotypical responding across the sample as a whole and a significant tendency for believers in telepathy to be more likely to choose the stereotypical response than non-believers. A second much larger study, carried out as a live experiment on BBC's "Tomorrow's World" programme, again showed the typical pattern of stereotypical responding (n=56,827). However, in a subsample of subjects for whom it was known whether or not they believed in telepathy (n=2,106), a significant tendency was found for non-believers to be more likely to choose the stereotypical response.

'OUT OF THIS WORLD': BELIEF IN THE PARANORMAL AND ITS REPRESENTATION IN THE MEDIA

Wiseman, Richard, Harvey, Jo, and Smith, Matthew

Perrott-Warrick Research Unit, University of Hertfordshire Hatfield UK

The paranormal has recently been receiving a great deal of attention in the media. Taking advantage of this fact, this study examined the relationship between paranormal belief and

attitudes towards media reports of ostensibly paranormal events. More specifically, we investigated whether a sceptical commentary significantly altered viewers' expressed scepticism regarding ostensibly paranormal events when presented on television. Subjects were shown two short film clips taken from 'Out of this World', a BBC TV programme on the paranormal. The first clip consisted of an uncritical report of an ostensibly paranormal event, whilst the second consisted of a critical commentary that suggested alternative, non-paranormal, interpretations of the event. It was found that subjects who expressed high paranormal belief ('sheep') tended to rate the uncritical report as being more interesting and entertaining than did subjects who expressed low paranormal belief ('goats'). This pattern was reversed for the critical commentary. It was also found that the sceptical commentary significantly increased the expressed scepticism towards the events for both 'sheep' and 'goats'.

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BOOK REVIEW

Science on Trial

By Jamie Ravell

Jamie Ravell is a medical laboratory scientist working in a hospital in Kent. He is a member of ASKE.

Marcia Angell. *Science on Trial: The Clash of Medical Evidence and the Law in the Breast Implant Case*. WW Norton & Co. 1996. ISBN: 0-393-03973-0.

Contents: Preface / The Breast Implant Story / Breast Implants / The FDA Ban on Implants / The Rush to Court / Scientific Evidence / Science in the Courtroom / Greed and Corruption / Americans and Health News / Breast Implants and the Rejection of Science / Where We Stand / Notes

In 1994, the results of the first clinical study to determine whether or not silicone breast implants cause disease were published. Since then, two more major studies and a number of smaller ones have also been published. The conclusion is almost unanimous: scientifically speaking, there is no evidence that silicone breast implants cause disease. The only major exception has come under criticism for failing to base its findings on actual medical records of the people concerned.

The myth that the implants are harmful seems to have arisen from the fact that direct injection of large amounts of liquid silicone into the breast leads to an inflammatory response and unpleasant internal scarring. However, it was the failings of this very practice that led to the development of the modern type of implant in 1962. This type is, so far as we are able to tell, incapable of causing any of the diseases of which it is accused.

Yet, in the US, these implants are banned on health grounds and billions of dollars of compensation have been handed out by the courts and in out-of-court settlements. Indeed, the ban was announced in 1992, two years before any clinical studies had been completed. How could such colossal sums of money be awarded in

damages without there being any hard evidence? The reasons are many, but include scientific illiteracy, financial greed and the nature of the US legal system.

Angell's book outlines in clear, layman's language, the history of the breast implant controversy in the United States. The result is a study of the differences between the nature of evidence in the courts and that in the laboratory. It makes sobering reading, and touches on matters of direct interest to skeptics in a chapter on the modern surrender to mystical thinking and the concurrent growth in the alternative medicine industry.

On the negative side, large parts of the book deal with features of the US legal system that are not relevant in our own. Unlike America, for instance, we in the UK do not (so far as I know) spend 2.3% of our GDP on suing each other. Indeed, silicone breast implants are still available in the UK, which may well limit the appeal of the book to British readers.

None the less, the book is interesting and is well-written with copious references in a separate section at the back. Legal systems aside, many of the points made in this book are equally applicable in any country and certainly extend well beyond the specific question of breast implants. The way the media fans health scares comes in for criticism, as does the ready acceptance of pseudo and anti-scientific thinking among many sections of the community. These are all points well worth making in the modern world.

LETTERS

MOST DEFINITELY WITHOUT PREJUDICE

from Jean Brodie, Bristol

Editor's note: This letter was written to Dr. Michael Heap, a member of the ASKE Steering Committee, in response to an article about ASKE that appeared in the Independent on Sunday newspaper

Dear Dr. Heap,

I remember hearing that your great grandfather told Jules Verne that to go 1000 leagues under the sea was impossible and, as for travelling to the moon, utter madness! Ah! Scepticism, that wonderful combination of ignorance plus prejudice, still alive among the blinkered few who think they have all the answers to God's Universe.

Do you know that funny joke? "What's the difference between God and a doctor?" Answer: "God doesn't think he's a doctor!" and does that not sum it up? Copernicus, Galileo, Da Vinci, Pythagorus (he who spoke of Atlantis) where would we be without their vision, their enquiring natures? We would be stuck in a back-water university proclaiming that because we cannot prove it, it cannot exist. You have to SEE it first!

And I love the way you lump everything together under your blindfold - Flying Saucers (in spite of the recent sighting in the USA of one the size of three football pitches seen by hundreds of people), the Loch Ness monster, Clairvoyancy (a gypsy laid my life bare - uninvited - on a beach in Blackpool once, where I, being an academic and analytical, said nothing, and gave nothing away, from under my dark sunglasses) Crop Circles can you show otherwise? Past life Regression - in spite of documented affirmation that could not have been known at the time and, to crown your list, Alternative Medicine.

The World Health Organisation has documented that 84% of the world's population rely on alternative medicine. Acupuncture has been around 2000 years. Modern medicine about 150. Alternative medicine sees

the sickness as part of the whole, modern medicine compartmentalises it. Just as they take away the healing of the plant's total medicinal substance (a practice condemned by WHO). In my work I have seen a brain-damaged child diagnosed as incurable, an epileptic (with over a 100 clonic spasms per day), and with cerebral palsy, declared educationally sub-normal (she is just one example) come back to life on homeopathic medicine, and become a lively child who speaks fluent French, plays the piano and goes to ballet classes and is free of epilepsy. Now, considering to apply for a Ph.D. in the light of ten year's experience of treating such children, I am invited by a large Charitable Trust to set up a national network of therapists of Homeopathy, Cranial-Sacral Therapy, Reflexology, Aromatherapy, who will work in conjunction with Dolphin Therapy, to treat such children (all of which will be well documented and used for research in 2/3 years time) and then I think (on my past experience) you will be forced to eat your words and made to look very foolish indeed.

And what do I tell my patients? Two surgeons (one an ex-oncologist now a psychologist), several doctors, nurses, health practitioners, lawyers, surveyors, an ambassador, journalists, an atomic scientist (with leukaemia that has responded) autistic children who have responded, children in convulsions ditto. Do I tell them some unknown psychologist says they imagine they have become well because they were given a placebo! My dentist rang this morning after doing a gruelling two hour root-filling on an my tooth yesterday. He expected me to be in severe pain for 48 hours, extremely tender for three weeks, in the tooth area. I have no pain, no discomfort because HYPERICUM 30 (one dose) prevented it from

happening, just as ARNICA 200 (one dose) prevented my young grandson's brain from swelling when he hit a concrete floor with his head from 15 feet up, which resulted in a severely fractured skull and a prognosis he would not survive. Or Mr. Mortensen, the eminent surgeon at the John Radcliffe, Oxford, who has it documented that I did not bleed during surgery which took away a large Adenoma and part of the intestinal wall because I took some of my own medicine to prevent it and speed up my healing process. You really know

nothing. What you do do is take away hope from people by your arrogance. People who might seek help, and be helped, when modern medicine has let them down. Can you live with that?

But, of course, you must be true to the dictates of the first meeting of the BMA in which they stated that what cannot be proved by them cannot exist. If that is so we would still be hunting dinosaurs with clubs. But then YOU still are!

My response to Ms Brodie's letter

by Dr. Michael Heap

Jules Verne

Jules Verne's anticipation of technological accomplishments beyond those permitted by prevailing knowledge and expertise does not represent the focus of sceptical enquiry. On the other hand, had the author announced that he himself had actually voyaged under the sea (or, for that matter, been to the centre of the earth) he would have been making what at that time would have been an extraordinary claim and we would not have taken him at his word but would have demanded clear and convincing evidence. Moreover, his fantasies were not informed by any privileged knowledge unavailable to scientists at that time. Indeed, it is scientists who make possible the technological achievements (at least some of them) anticipated by writers of science fiction, not the latter themselves, and only through the demanding processes of meticulous and systematic observation, strict accountability to objective evidence and the rules of logic and mathematics, and the rigorous testing of all predictions, claims, and theories, nothing being taken on trust. These are the very processes which sceptics advocate for all testable claims and beliefs. Who would travel in a submarine, aircraft, or spaceship on being informed by the crew that "scientists don't accept that this can work but we know that it does"?

Hunting dinosaurs with clubs

Science astounds us most by its high-tech achievements but we are similarly impressed by what it has taught us about our remote past and origins, a notable instance, which holds our fascination, being the dinosaur. My imagination was therefore stimulated by the reference to the possibility of our "still hunting dinosaurs with clubs".

How can we be confident that our thrill and awe with these creatures, which now largely exist as collections of bones, are not founded on illusions, misinformation, deception, wishful thinking, and the like? Only by insisting on the strict application of scientific methodology, namely the collection and sharing of objective evidence; the presentation of clear arguments to justify any interpretations made of the data (e.g. that members of such-and-such a species were herbivores and sociable); and the acceptance of, indeed insistence upon, the open criticism and challenging of these interpretations, and the search for any more plausible ones.

Thus we can accept with confidence the palaeontologists' conclusions that the dinosaur became extinct tens of millions of years prior to the arrival of our primate ancestors. And so, early man never encountered a dinosaur, least of all hit one with a club.

Lumping together unusual claims

Scepticism is not equivalent to disbelief; it judges any claim on the evidence presented. We can "lump together" crop circles, the Loch Ness monster, extra-terrestrial visitors and abductions by such, astrology, much of alternative medicine, and the co-existence of man and dinosaur because (i) they involve astonishing claims, unsupported or contradicted by existing scientific

knowledge; (ii) if the claims were true then they would have extraordinary consequences for us and the way we understand the world; (iii) there is little reliable evidence to support the claims; (iv) more plausible explanations are available which are consistent with existing knowledge; and (v) they are of public interest and concern. Parenthetically I might add that the claims themselves cannot be disproved.

We can “lump together” the aforementioned phenomena for the additional reason that they collectively invite a non-critical and credulous attitude as characterised by our critic.

Scepticism about medicine

Claims for the curative effects of any substance or procedure should always invite a sceptical appraisal. Indeed, having worked with and taught for 27 years medical doctors and allied professionals, I am impressed by how prepared they are to question their work and to entertain the notion that much of what they do, though rationally based, has yet to be demonstrated to be sufficiently efficacious to justify the time and resources spent, or has yet seriously to address the relevant issues concerning the restoration and maintenance of good health.

Such scepticism and self-reflection contrasts with excessive credulity among the purveyors of alternative medicine, not only concerning their own practices but also with regard to what curative medicine can actually achieve. Yet it is they who are making the most spectacular claims, which demand the support of equivalently impressive evidence.

Scepticism in medicine is not simply to do with how effective treatments are in comparison to placebo controls; it should also question the priorities given to the various ways of pursuing the goal of good public health and well-being. Alternative medicine does not do this, although I believe that the present arrangement of a dominant orthodox (largely public) and a minor unorthodox (largely private) sector has much to recommend it.

Homeopathy

Homeopathic preparations are the product of repeated dilutions which leave them indistinguishable

from their diluent, the residual solute being infinitesimal or absent altogether. The claim that such preparations have curative properties is therefore impossible to reconcile with our understanding of the fundamental nature of the physical world. This understanding is not simply dogma but the result of centuries of painstaking investigation and evaluation.

The homeopathic preparation arnica is claimed to reduce bruising and is used in the treatment of post operative bruising and pain. I know of dentists who use it routinely. There have been ten clinical trials examining the effects of arnica in trauma. These have had mixed results. The most recent one (Hart, Mullee, Lewith & Miller, 1997) attempted to impose all necessary conditions for a fair clinical trial (double blind, placebo controlled, and randomised allocation of patients) and found that patients who had undergone total abdominal hysterectomy and were given arnica C30 reported just as much post operative pain, and required the same quantity of analgesics, hypnotics, antibiotics, and antiemetics, as patients given a placebo preparation.

Matters that are of relevance to scepticism extend beyond the immediate framework which I earlier sketched and include considerations of the nature of human beliefs, motives and behaviour. The above account of the investigation of the therapeutic efficacy of arnica provides us with rich material for sceptical debate.

One lesson that controlled clinical trials teach us is how difficult and complex it is to demonstrate that a treatment or procedure is active beyond the net impact of non-specific factors. (We can add to this the determination of any adverse side-effects and the trade-off of benefits and disadvantages.) Indeed we should be impressed by how scientific knowledge itself is not easily gained.

Another point of interest is the extent to which tests of treatment efficacy fall short of the required standards. This is revealed in the introduction to the Hart et al study and illustrates that often poor research is worse than doing no research at all. Moreover, again we find that the effect of an unusual claim diminishes or vanishes altogether the more stringent the evaluation becomes. Nevertheless, were a homeopathic dilution shown to be distinguishable from a known inert control substance under the most exacting of test conditions, this would be of no mean consequence for modern science

(hence the extraordinary attention given to the Benveniste studies). But even so, does the magnitude of the therapeutic effect justify, say, the funds and resources required to guarantee availability of the treatment within the health service? The investigators in the above study concluded that the net benefit of arnica in clinical practice, if it exists at all, is likely to be very small and perhaps not worth its routine use.

“It’s been used for thousands of years.....”

It is interesting to consider what those practitioners committed to a particular medicine do if clinical trials show it to be no more effective than placebo. Should they stop using it? Should they substitute it with a cheaper inert substance? Not necessarily. The constraints which operate in a well-controlled clinical trial are irrelevant and restrictive in normal practice. Here the important aspects of any therapy must be fully represented; the Aesculapian authority of the healer; the therapeutic rapport; the conviction of both healer and patient in the validity of the treatment; the positive expectations of the patient; proper and solemn regard for

the ceremonials of assessment of symptoms, diagnosis of illness, and prescription of treatment; and so on. These important ingredients are absent in the double-blind procedure, when there is random allocation of patients and standardisation of treatment, and so on. They, along with other advantageous factors - the variable nature of many illnesses, the ability of the body to repair itself regardless of treatment, the power imbalance inherent in the therapist-patient relationship which favours the perceived authenticity of the former, the multiple definitions of “improvement”, and so on - may collectively ensure that a therapeutic practice which has little or no validity can survive indefinitely - viz. trepanning, bleeding and purging. Hence the fact that “Acupuncture has been around for 2,000 years” does not allow us to infer anything at all about its effectiveness as a treatment.

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DiETING

From Professor J. S. Garrow, Rickmansworth, Herts. Chairman, HealthWatch

On p26 of your August 1997 issue Dr. Trevor Jordan asks "What is the likely weight loss in one week of someone who fasts totally?"

Total starvation is no longer an accepted treatment for obesity, because a few days fasting does not help to solve the problem, and people on prolonged fasting may unexpectedly die. However between 1964 and 1970 there were 5 studies involving 87 patients, in the UK, USA and Sweden, of severely obese people who were fasted for more than 6 weeks. The mean weight loss in the groups ranged from 210 g to 410 g/day (Garrow 1974 *Energy Balance and obesity in man* Elsevier, Amsterdam: p 255). So the answer to Dr. Jordan is that for fasts over 6 weeks in severely obese patients the likely weight loss in one week is 1.5-2.9 kg.

Over shorter periods, and for not so severely obese people, the answer is less clear. We studied 103 women, weight 100.4 ± 23.5 kg (mean \pm sd) who were on a diet supplying 800 kcal/d for 3 weeks, and the mean weight loss was 4/9kg, giving an average of 1.6 kg/week. However the weight loss in the first week was greater than that lost in the second and third week, because initially glycogen and water are lost, and later some of the weight lost is adipose tissue. The average weekly rate of weight loss after the first week was 1.48 kg, with a range (5th to 9th centile) of 0.76 to 2.44 kg. The greater the initial weight of the patient the higher the rate of weight loss on the diet ($p < 0.001$) (Garrow & Webster 1989 *Lancet* i: 1429-1431). Dr. Jordan is right to be skeptical of a claim that 17 lb (7.7 kg) can be lost in a week on a diet,

unless treatment also involves severe purging, diuresis or the amputation of a limb!

Editor's note: We thank Professor Garrow for his answer to Dr. Jordan's request for information. If any other members of ASKE wish to pose questions to our readers, we shall be more than happy to print their queries.

ASKE

THE ASSOCIATION FOR SKEPTICAL ENQUIRY

Aims and Principles

- 1 ASKE is committed to the application of rational, objective and scientific methods to the investigation and understanding of ideas, claims, and practices, especially those of an extraordinary or paranormal nature.
- 2 ASKE is committed to challenging the uncritical promotion of beliefs and claims which are unsupported or contradicted by existing objective and scientific knowledge.
- 3 ASKE opposes the misinterpretation and misrepresentation of science for purposes which deceive the public.
- 4 ASKE supports the objective evaluation of all forms of medical or psychological techniques offered to the public and opposes the uncritical promotion of techniques which are unsupported or contradicted by existing scientific knowledge.
- 5 ASKE supports all efforts to promote the public awareness of the rational and scientific understanding of extraordinary and paranormal claims.
- 6 ASKE is committed to a rational understanding of the reasons and motives which underlie the promotion and acceptance of irrational and paranormal claims and beliefs.
- 7 ASKE accepts the rights of individuals to choose for themselves their beliefs about the world.