Commensal

The Newsletter of the Philosophical Discussion Group

Number 103 **October 2000**

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17th September 2000 **Theo Todman**

EDITORIAL

We now seem to have resumed normal service, and hopefully it will continue uninterrupted from now on ! Indeed, I've decided to get ahead of the game and issue Commensal 103 before the deadline (this is because I'll be out of commission for a couple of weeks from 26th September - I hope this doesn't upset the plans of anyone hoping to make a contribution to *Commensal 103* just before the deadline; as you'll see, we're full ! That said, I'm about to start a part time BA in Philosophy at Birkbeck College, London University, in addition to the day job, so life might be a little fraught for the next four years. We'll see how things go.

PDG Gathering 2001

As announced last time, Roger Farnworth & I need to get going organising next year's *Gathering* (note the change of name - this is deemed less forbidding than the more august term *Conference*). It will be on the subject of *Consciousness* and will be held at Braziers Park over the weekend of Friday May 4th - Sunday May 6th 2001, so please reserve these dates in your diaries. Hopefully in December's *Commensal* I'll be able to announce the draft programme of events - so if you want to speak - and I hope you will - please let me or Roger (on 01208 821 544) know as soon as possible.

I hope all goes well in early October with Jane Benn's Conference on Education. I also hope we'll in due course receive a summary from Jane or some other attendee. I expect still to be recovering from the uncomfortable after-effects of an operation, so won't attend. A slightly amended programme of events follows :-

THE 100th MENSA INFORMAL RESIDENTIAL DISCUSSION CONFERENCE
Braziers Adult College, Braziers Park, Ipsden, Wallingford OX10 6AN

THE AIMS OF EDUCATION
Chairman: Jane Benn

6th - 8th October 2000

Friday	**6th October 2000**
18:30	*Supper*
19:30	**Introductory Session** - including initial thoughts on what we individually believe to be the main aims of education; delegates are invited to bring their own one-sentence definition.
20:30	**Alan Edmonds** - Notes on attitudes to education in the UK, including some questions about teaching methods and some European comparisons.
22:00	*Refreshments*
Saturday	**7th October 2000**
08:30	*Breakfast*

09:30	**Alan Hassell -** What the well-educated adult should know?
11:00	*Coffee*
11:30	**Leslie Haddow** The various aims of education and the compromises necessary between them.
13:00	*Lunch*
Afternoon	*Free*
16:00	*Tea*
16:30	**John Maxwell -** Student-centred education.
18:00	**Sheila Haddow -** Motivating the individual.
18:30	*Supper*
19:45	**Interlude -** Delegates are invited to entertain and educate us with a favourite piece of poetry, literature or music (cl0 minutes maximum); musical delegates are invited to make use of the good piano available, or bring their own instrument. And those who believe that a glass or two of wine would add to the enjoyment are invited to bring an appropriate bottle.
22:00	*Tea and coffee*
Sunday	**8th October 2000**
08:30	*Breakfast*
09:30	**Jenny Turner -** The relative merits of the Internet, CD-Roms, and books in education.
11:00	*Coffee*
11:30	**Pam Ford -** Proposals to bring more intellectual content into Mensa activities.
12:00	**Final Discussion and Plans for Future Conferences**
13:00	*Lunch* Conference ends, but delegates wishing to stay on for informal discussions and tea are welcome to do so.
NOTE	There will be ample opportunity for general discussion after each presentation. Speakers have been asked to restrict their contributions to a maximum of 45 minutes, and most have indicated that they will in fact be speaking for a considerably shorter time.

PDGList

This is the internet discussion group of PDG and invited guests. The list seems very active at the moment, with 45 members. If you don't want to be inundated with emails you can sign up as a "daily digest" member or a "web only member"; the latter option allows you to browse past emails on the web without them clogging up your inbox.

To join PDGList you need first of all to log on to http://www.egroups.com and sign up to eGroups. Then you need to apply to join PDGList itself. You can do this by initially doing a search on “pdglist” and then following instructions. Alternatively, and quicker (though you will thereby miss out on all the wonders of eGroups !), you can go directly to http://www.egroups.com/group/pdglist – again, you will need to join eGroups first (it will prompt you) – and then click on the “subscribe” link or button. Either

way, I then need to accept your application. Once accepted, whenever anyone posts anything to the list, you will automatically receive an emailed copy of the posting (subject to the alternatives above). To post something yourself, just email to pdglist@egroups.com and everyone on the list will receive a copy.

Why not give it a go ?

Incidentally, for those who've signed up for PDGList, MS Word 97 versions of all the back-issues of Commensal since I've been PDG Secretary are available in the "Files" area at the PDGList website (http://www.egroups.com/group/pdglist).

PHILOSOPHY FOR ALL – PFA[1]

Kant's Cave : On every first Wednesday of the month, from 7pm (lecture at 7.30 pm) PHILOSOPHY FOR ALL meets at "**Kant's Cave**" for a lecture, debate and social evening. Kant's Cave meetings are now held at the **cellar bar** of The Penderel's Oak, 283-288 High Holborn, London (3 minutes' walk from Holborn tube station). Door-charge: £1 (free for PFA members)

UPCOMING KANT'S CAVE LECTURES

4 Oct 2000	Dr. Barry C. Smith (Birkbeck College, London) : tba
1 Nov 2000	tba
6 Dec 2000	Dr. Veronique Monoz-Darde (University College, London)
3 Jan 2001	tba
7 Feb 2001	Dr. Eric Frankel and Dr. Stephen Szanto (Whipps Hospital London) : Brainwashed Youth - A Neuroscientific and Philosophical Appraisal

The PFA at the Mary Ward Centre : **Philosophy Debates** are to be held approx. monthly on Saturdays 14:00 - 17:00; Dates : 14 October, 2 December, 16 December, 17 February, 3 March, 7 April, 19 May, 2 June, 9 June. There are also **Public Lectures** on some Saturdays 10:00 - 13:00; Dates : 28 October & 7 April. The Mary Ward Centre is at 42 Queen Square, London WC1N 3AQ. There is no fee.

Philosophy of Science Workshops (Filiz Peach) : Conway Hall, 25 Red Lion Square, WC1R; 19:00 - 20:30. Tuesday 10th October, Tuesday 14th November, Tuesday 12th December. Admission free.

Borders Bookshop, Oxford St.; Wednesday 11th October. Ted Honderich debates with another contemporary philosopher (tba) some questions raised by his part-philosophical, part-autobiographical book *Philosopher : a kind of life*.

[1] See C100 (or http://www.pfalondon.freeserve.co.uk) for more details on PFA. It has no relationship with PDG or British Mensa.

ROYAL INSTITUTE OF PHILOSOPHY[2]

Annual Lecture Series, 2000-2001 : Logic, Thought and Language

2000		
13 October	Mark Sainsbury	*What Logic Should We Think With?*
20 October	Gregory McCulloch	*Mental Representation*
27 October	Julia Tanney	*Self-Knowledge, Normativity, and Construction*
3 November	Barry Smith	*Thought and Language*
10 November	Alan Millar	*The Normativity of Intention and Meaning*
17 November	Gabriel Segal	*tba*
24 November	David Wiggins	*tba*
1 December	Crispin Wright	*Relativism and Classical Logic*
8 December	Jennifer Hornsby	*Communication*
2001		
19 January	Christopher Peacocke	*tba*
26 January	M. G. F. Martin	*Language*
2 February	A. W. Moore	*What Are These familiar Words Doing Here?*
9 February	Scott Surgeon	*The Conditionality of Thought*
16 February	Timothy Williamson	*Possible Beings*
23 February	S. G. Williams	*Ambiguity*
2 March	Bob Hale	*Logical Knowledge*
9 March	Charles Travis	*Rethinking Psychologism*
16 March	Paul Boghossian	*Rational Belief*

All Lectures to be given at 14 Gordon Square, London WC1 on Fridays at 5.45 pm. Admission is free.

PDG Web Page

Further to the announcement last time about my web-site, (http://www.kenrick-todman.freeserve.co.uk or preferably http://website.lineone.net/~theotodman/), which has had rather a lot more gubbins crammed onto it over the last month, I've now set up the PDG web page at the similar alternative addresses :-

http://www.kenrick-todman.freeserve.co.uk/pdg.htm
or
http://website.lineone.net/~theotodman/ pdg.htm

The site now contains 9 back issues of *Commensal*, including the 6 most recent ones. The advantage of the HTML versions is that they allow you to hop around between articles (useful for understanding the mixed-bag commentaries on previous issues).

[2] No connection to PDG or Mensa, but I can very highly recommend these lectures.

Hopefully, we'll soon get the links from the Mensa web page, which should help advertise the SIG.

This raises the issue of privacy - we've mentioned this idea for some time, and I pointed out the fact that the site is open to anyone who knows the URL. Currently, not many do but eventually it'll become more widely known. I've probably adopted a rather cavalier approach in just bunging the back issues up there, and it may be that some people don't like the idea of people outside the group reading what they've written (no that this can be prevented - anyone in *Mensa* can ask for a newsletter). However, if you <u>are</u> sensitive about this issue, please let me know. I can either place your articles on the PDGList web-site (where only PDGList members can access them) or I can omit them altogether. I'd prefer this not to be requested frivolously as it involves me in extra work - but either is technically possible without too much bother, so if you are concerned, do let me know. **In the future, I will assume that any article submitted for publication in *Commensal* is OK for placing on the web-site, unless you tell me otherwise.**

You will note that I've made an attempt to return to commenting on the articles submitted, or at least on those early on in this edition of Commensal. Those appearing later deserve comment also, but space ran out. I also want to get this issue off for distribution so I can concentrate on my studies. I hope my remarks aren't too rushed and superficial.

<u>Next Issue of *Commensal*</u>

The next edition of *Commensal* (**C104**) will appear in December. The closing date will be 15th November 2000. The reminder date appears on the bottom of each page.

Might I just make one point - given my commitments at the moment, I will no longer have time to type hand-written contributions. My preference is for contributions to be emailed or sent on floppy disk. Otherwise neatly typed and printed using a good ribbon so that I can scan them in. I realise that some of you may not have this capability, so could I ask for a volunteer to offer their services as a typist for those who cannot do so themselves ?

Best wishes !

<u>Theo</u>

August 2000 **Albert Dean**

COMMENTS & ODDS AND ENDS

Theo's Not Bull (C102/9): The original chicken's egg was the egg of one species of Indian Jungle Fowl that was by human intent fertilised by another species of Indian Jungle Fowl. That was done several thousand years ago and there is nothing we can do about it now, likewise in regard to cross bred cattle similarly cross bred in the past. A new not bull's egg would be as if from one species of bull fertilised by another species of bull. Unless the fertile not bull's egg is entirely man made the rights of all the ancestral bulls in regard to their offspring will be violated. It may be desired to look at countless other animals later. Some take it as their duty to defend the rights of those not able to defend them themselves. An optimal solution would be to genetically engineer such people into an entirely placid separate species, the preservation of which we could then consider. What other solution can there possibly be.

Sanity: The dictionary says the word sane is used to mean in one's senses and free from delusive prejudices and fancies. The wording is quite precise. It requires only that one internally has a reasonable grasp of whatever matters come one's way. The condition being so internal perhaps one could measure one's own sanity, being wary of course that in examining oneself too little or too much one could well be engaging in a delusive prejudice or fancy.

Concerning sight, sound, smell, touch and taste, the basic senses, one could perhaps simply ask does one respond to relevant experiences in ways not necessarily identical but nevertheless fairly consistent with how many other people of similar background and circumstance seem to respond. I say many because only by comparison with many can one assume a reasonable amount of statistical averaging, and towards that averaging I should also say the many should be of the general culture one is used to, and include how one understands at least two or three generations of people in that same culture are reported to have reacted to like experiences, also how it is assumed the next two or three generations of that culture are expected to react to them. This is to try and correct for the possibility one might be living within some historical event. These and similar qualifications will also apply in the following.

With emotions one might try asking whether one generally finds what the world treats as tragic, comic and mundane to be respectively miserable, funny or of limited interest.

For the intellect one could possibly ask whether there are any matters about which one holds a strong independent view, and where one can see not any ground at all on which those one compares oneself against seem to hold some contradictory view.

Lastly one should maybe then ask whether others say, and one agrees, that one has some condition or one has experienced some traumatic event, and whether that pretty obviously explain any unusual attitude one seems to have in regard to some particular aspect of life. And, whether, if one was of a different background and circumstance one's views would probably be somewhat similar to those of people in the corresponding group.

Then, if one's answers to all the above cast a broadly positive light, it would seem one is tolerably sane relative to everyone else.

Curiously, granting one compares like with like, these tests look as though they would not need to be all that different to apply them others, even to animals. But, of course, one would need considerable knowledge of a subject's history and situation to minimise the risk of error.

The above is all comparative. For an absolute test it would be necessary to briefly expose oneself to a very wide range of sensations and ideas and check for logically correct responses. Doing that in even a small way for most would be quite impracticable at the moment. Reflecting on several years or decades of experiences as when chatting to relatives or friends, amounting to performing the checks outlined above without realising it, is perhaps about all that might be done.

However, it is likely that in fifty years or so there will be virtual reality absolute sanity testers for adults, children, dogs, cats and any other pet one cared to name. It only requires a few extras on our computers and someone to write the necessary programs. No doubt the sessions will all begin with the subject suspended in darkness and a test to see if they are aware. Is it not ironic the most widespread application of the classic question about whether we are absolutely here will be to show we are absolutely crackers!

The Amount Of Energy In The Great Void: Previously I demonstrated that the great void is an eternally infinite closed system and that the greater universe, taken to include any energy of space and other universes there might be, is only an eternally closed system within that void. I left the question as to whether the greater universe is finite or infinite in size or content, and, whatever the case, whether its condition in such respects is eternal.

The problem may seem one that can not be answered with any certainty at all. However, a definite answer is actually quite easy to establish. We need only remember that what is in and around us is real, including the underlying emptiness in which all is, and bear in mind that any gap anywhere in the greater universe would mean it is finite. Then there are only three situations to consider.

The two extreme situations are trivial and can be dismissed, they are where there is no energy or there is infinite energy, it is obvious the energy where we are is some, so, we are left with only that as the actual situation. With that, the greater universe is then also of finite volume simply because a finite amount of energy can not be stretched out into an infinite emptiness without tearing somewhere. To settle the durational issue we also have it that the energy forming the greater universe is real so could not be less nor more than it is. This gives us the conclusion: Nothing but an eternally finite quantity and finite volume of energy in an eternally infinite emptiness.

With no beginning or end our local universe is probably just some energy in one particular form in an infinitely long succession of forms, and, as there is no ultimate

voidal restraint, more likely than not there are countless other universes out there in whatever forms they presently happen to have. However, one does not say that is so, claims such as that can only rest on probability relative to what seems usual in this universe of ours, where, when we look, we often discover the apparently unique to be no more than an example of what is common.

However, no matter how the energy is arranged there is a little more that can be said. For convenience I shall mix two topics, it should not be difficult to separate them. One theory of creation says God is eternal and formed the local universe. This would only mean God is some long established form of energy with spiritual, intellectual and life properties in the greater universe. We know part of the energy in the greater universe, meaning ourselves, certainly has life and intellectual properties, and it is said it has spiritual properties. Now, whether spiritual properties exist or not, the others certainly do. And we have no reason to believe they are lost if the energy demonstrating them takes a different form, nor to believe they are not within all energy in all its possible forms. So, we can say the perhaps spiritual and certainly intellectual and life properties of energy have no beginning or end.

In a previous item I said that in fact energy is entity, it is more straightforward than supposing there is an entity universe mixed in with an energy universe to account for all that we observe in everyday life. Taking up that earlier line, then what do we now have but an eternally infinite void in which there is an eternally finite quantity of life. The answer to everything therefore becomes that in limitless nothing there is one or more accumulations of entity that always had and will always have the potential to demonstrate life, thought and possibly bliss, and perhaps more.

With all this it is very important to be careful with the word "why". In essence the Shorter OED says "why" is used to ask "for what reason" and gives about twenty five usage examples. Critical reading of the dictionary's statement and those examples will show we ask "why" with the assumption there is a reason to ask for. However, if a truly closed system exists no reason is required for it to do so.

Towards An Easier Mathematics: The essential problem with mathematics is that practically nothing in the universe carries a little sign saying what symbol represents it and hardly any of the symbols used ever carry little signs saying where they are to be put and what is to be done with them. This truly deplorable situation could be entirely relieved by the release of vast swarms of suitably equipped micro-robots.

The Personal Website: I there. For I not.

Albert Dean

Albert : with respect to **bulls**; some agreement here, but I think the issue is not with the rights of ancestors over their remote progeny but with the rights of individuals not to be born to certain forms of life. Also, with respect to defending the rights of those

not able to defend them themselves - amusing though your response is, surely the complaint has to have some limiting scope. I take it that rights are given rather than natural, but needs are natural and it may be seen to be right to satisfy as many needs as we can. However, we cannot satisfy all needs as we have limited resources and needs conflict. We also have our own needs, as individuals, to satisfy - these deserve some weight as well. This said, we might like to grant rights to some of the powerless with whom we have an affinity and whose plight we either have shared, could have shared or may yet share. How widely this net is cast depends on means and also the sensitivity of our empathy (or maybe of our anthropomorphising tendencies). At the moment I suspect that bulls are outside the scope.

Concerning **sanity** - wouldn't what you say would make all deviants insane, and make progress, at least other than the gradualist sort, impossible ? You are right, I think, to say that sanity is related to cultural norms. However, I think sanity rests not so much on an individual conforming or not, but on them knowing whether or not they are conforming. I suppose we run the risk of infinite regress here, but we need to judge the reasons a person gives for heretical belief, perception or action. A person is sane if their beliefs are held for defensible reasons - though, again, what is defensible is often culture-driven.

Concerning the **great void** : please explain why "any gap anywhere in the greater universe would mean it is finite". When you refer to "infinite", are you not assuming that the universe is Euclidean ? I am, as usual, troubled by much else in this section. Could you explain your thoughts in such a way that I, at least, can follow your logic ? Ie. when using words that look as though they indicate conclusions to an argument, please show how the argument works. I am too dim to understand what on earth you are on about. Please explain. Can anyone else out there expound Albert's thoughts for us ? I hate printing stuff that neither I, nor anyone else as far as I can tell, can make head or tail of. But I don't want simply to ignore it.

Concerning **mathematics** : our senses of humour fail to agree, once again. We all agree that mathematical modelling is a fine art. Mathematical models are useful if they work, else not very - except to show quantitatively or structurally what's wrong with the model. Your little signs don't seem to refer to quantity or structure so I wonder whether they have anything much to do with mathematics. However, there is some slight resemblance between your thoughts and those of Martin Kusch later in this edition of *Commensal*.

Theo

9th September 2000 **Ann Kucera**

WE ARE MANY

It has be said that any intellectual woman, deprived of educational opportunities, will turn her attention to religion. This may be because the Bible stands handy next to the

telephone book in her limited home, and her philosophical bent, common to most of the highly intelligent, finds no other body of information available to worry. Thinly populated Central Maine is an educational wasteland, and here men as well as women lack intellectual meat on which to chew.

In this northern extension of the Bible Belt one can attend a new church each week in search of an interesting and invigorating preacher. This kind of buzzing from spiritual flower to spiritual flower seems to feed a mental hunger and energizes the somnolent imagination.

We encountered a wide selection of differing beliefs when we strayed outside the circle of mainline Protestant country churches, as also Catholics, Jews, Mormons, Universalists, Muslims, Jehovah's Witnesses and Seventh Day Adventists, each claiming to have the one true faith, can be found in any sizable town. For the curious explorer it is easy to attend their services as most congregations are eager to welcome you, and members are often willing to come right to your home in order to engage you in refreshing debate. It is also an advantage that their dogma, however startling sometimes, can be found in print, where you can examine it after the departure of the missionaries.

Some much farther-out religious groups, with only a very slender written creed, are also very common in this old fashioned Maine setting. There are the Dowsers, the Noetics, Eckankar, Bahai, the Spiritualists and many more. We sought them out, observing their similarities and differences, cautiously side-stepping the knock-down-drag-out arguments so dear to our analytic hearts but so conducive to being asked to leave in a hurry.

The Noetic people, who were trying to discover a new system to satisfy all, were interesting, but too varied in their approaches to present any kind of united creed for our consideration. Every person present had his own system of belief, though perhaps the fact that they met at the University had exacerbated the problem. One day I stood up and asked everyone in turn about his or her strongest held belief and found the following, no two alike, all crammed into the same room.

Spiritualism	Automatic writing
Tao	Madame Blavatsky
Art	Amerindian lore
Natural childbirth	Self-esteem
Punishment of criminals	Colored auras
Anti-Methodist rage	Christianity
Carl Jung	Dowsing
T. Reich	Flying Saucers

With a few exceptions the attendees appeared to be sober and quite rational. But It did not seem as though these varied dogmatists would ever be able to combine into a new knowledge, and after the number of Taoists increased to three and started taking over, there was considerable attrition, especially when they began electing officers. I suspect that the unwieldy mixture was due to there not being enough supporters of a

single belief to form a congregation, and that they had originally clumped into this heady group out of loneliness, following their trek to Maine in flight from materialistic urban blight, for few of the participants proved to be of local origin.

The Spiritualists, on the other hand were chiefly long residents of Maine. We attended a number of sessions at a Spiritualist campground that had been established in Etna more than a hundred years earlier. Probably because there was no dogmatic body of literature in use to remind them, the concepts of spiritualism had changed over all those years. Though there were still mediums to pass on messages from the dead, I heard grumbles from some conservative participants that it was no longer obligatory to produce physical manifestations in order to prove one's contact with the souls that had passed over. The appearance of visible ghosts made of ectoplasm was out of fashion; all that was required in these degenerate days was the feeling that ghosts were there.

The ghosts of former campground attendees were said to be present, sometimes through spiritual contact with the trees; there was a visible elf reported living in one apple tree. Spirit Guides were still called up by mediums and messages delivered from the dead, but they had added laying on of hands to their armamentarium along with cures by music or aromas.

They performed regular services in their own church, singing popular hymns whose words had been adjusted a little and generalized, as had been the Universalist hymns. Selected psalms were also read. God was addressed as Infinite Intelligence or as Spirit. Some of the members professed to be also Christians and the chief medium was a Catholic who admired Carl Jung. These Spiritualists were also harboring a not yet unfrocked Catholic priest who had slipped into ecumenical Voodoo.

They all talked a lot about Energy, an indefinable substance, similar to both magnetism and electricity, swirling constantly around the world. An adept could seize hold of it and ride with it and receive many kinds of power from it. One could see that they did not limit themselves to worship but fancied themselves as magicians who could control the elements by means of personal power, acquired from God by means of meditation. They held hands and meditated in order to attract it; they called it channeling.

The Dowsers too, proved to be interested in attracting the same sort of energy by group meditation. This most enthusiastic gathering had been active for over twenty years, with monthly meetings in a private home. It was also connected to a national organization, as were the Spiritualists and Noetics. This was not a group of "incomers"; there had been associations of Dowsers in Maine since the start of the nineteenth century. The practitioners used clairvoyance or a rod or pendulum, and it was noticeable that nowadays they dowsed for everything but water; the only lady concerned with water preferred to locate it on a map of the property by dangling a pendulum over it, getting 'yes' or 'no' as an answer, according to the way it swung. The pendulum would also answer questions on almost any topic.

The Dowsers had a huge variety of energy applications. Some extracted or harnessed

the Energy from rocks, water, light or sound, either by thinking about it or by using favorite rocks, fountains, prisms or drumming to attract it. Unusual diets were recommended. Some made pilgrimages to South America to sit at the feet of shamans and share their drugs and unearthly thoughts; some traveled to England or other distant places to collect strength from important stones. Nearly all felt their sensitivity heightened in the presence of these "tools". We never heard the word "magic" mentioned despite the emphasis on personal powers rather than on the concept of God. The emphasis on power rising from cooperating but unthinking substances seemed to teeter on the borderline between magic and pantheism.

Proponents of complex systems of life management also appeared at the Dowsers meetings, supported by diagrams of the human body and its spiritual aspects. They had discovered mystery in various geometrical patterns, in Numerology and Astrology. A side trip to Eckankar, a group trying to mount a celestial ladder to Godhood from an office over a store, offered further diagrams setting out the correct route upward. There was more than a touch of Hinduism or Buddhism in all these mixes. Besides Yoga and several oriental healing systems there were Tai-chi and other exercises accompanied by flutes or drum beats. In none of these belief systems was much allowance made for the charity so important to Christian churches. Members were willing to use their spiritual powers to help other members drive away invading evil influences, but most offered little practical assistance.

Each meeting produced a speaker with some interesting or amusing new discovery to offer, followed by delicious refreshments. I thought of these monthly meetings as a sort of esoteric salon. The members were not poor and there were included a certain number of scam artists who wandered in, trying to make themselves look interesting and available. Several people offered healing either by touch or concentration and there were some witches in flowing garments. I will never forget the werewolf who had filed his front teeth down to make his canines appear larger. There were not too many emotional eccentrics; most appeared rational. Lapsed Catholics were common and there were splendid opportunities for argument as a number of attendees were heavy readers. There was much talk of meditation but I always found it poorly defined.

We were lured by one young lady to yet another curious group held in a Catholic high school, which was a puzzle in itself. We had a bible-sized book called a Course in Miracles. It purported to be the words of Jesus Christ channeled to a lady psychologist in New York. It was written in archaic language, with many non sequeturs, and its purpose appeared to be the removal of guilt by encouraging the sinner to forgive himself. He must love (undefined), and if he does that he can do anything else he wants to. One of the members had lately deserted his wife and children and was tearfully grateful to the Course for sparing him from the bad feelings normally connected to his action.

The most interesting thing about the Course was its training method. One had to stare cross-eyed at a chair or some other common object until it no longer made sense. There were many exercises, all calculated to destroy the mind's contact with reality, and when I protested, I was told not to approach the Course intellectually but to just

give in to it. We were advised by a theological historian, who seemed to be travelling the same exploratory path we were, that the Course was one of the mind-altering religions, along with Christian Science and the Unity Church. According to him they had all been based on the teachings of Marcus Quimby who had influenced Mary Baker Eddy to found Christian Science by curing her of an illness.

We were not looking to have our minds altered, so we resigned from the Course, urged on by hints from the membership. But not until I had asked a quantity of questions in my efforts to identify what we were talking about. The members, like all those in the varied mystical groups, were prone to mention prayer, a word used rather loosely. I asked them. not what they prayed for or to whom they prayed, but rather in what direction they sent their prayers. Was it up toward the sky or was it directed elsewhere? One and all said they directed their prayer somewhere into their chests, where lay their chacres (locatable on a diagram) and where God was said to be found. They did not like to think of God as a personality outside themselves, but rather as a kind of omnipresent glue connecting mankind to both the physical and immaterial worlds.

Until then I had never dreamed that our new friends were redefining God as a kind of personal power located within themselves. Had I read a little theology at the time or taken advice, I would have recognized in this giddy reversal of God's position the ubiquitous Transcendence-immanence controversy so dear to the hearts of the chattering classes. That is: whether God is out there directing operations or is He a power scattered and included throughout the universe. I was a little uncomfortable to find so many rational-appearing people worshipping themselves as well as sticks and stones, for I still clung to my childhood impression that God was a bearded old gentleman in a night-shirt.

When a Jehovah's Witness, who visited my house regularly, learned that we were frequenting a number of heretical New Age dens she was sure I would be swept away and lose my chance at her form of Heaven. She finally confessed her belief that Christ had no greater divinity than I had, because we were both "Children of God" and I recognized that she was also speaking of personal power rather than the monotheism on which I was raised. She appeared to be truly frightened for my future, but I assured her that I was not easily uprooted, even by her.

Her concern was something I had already considered. Like young experimental drug users who are out for a lark or searching for intellectual variety, but instead discover themselves caught in a well-baited trap, I might find that my cheerful dabbling in the occult would lead to a downward slide from my own organized settled religious beliefs into madness, or at best, into Inanity. So before these visitations into the lion's den I would prepare to maintain my integrity and was careful not to engage in any deviation from it, however charming the speaker, or dazzling the demonstration. I also made a point of never engaging in any rituals, for which I was glad, after observing the tricky brain washing methods of the Course in Miracles, which at this writing has attracted over five million devotees world-wide. When my various mystics sat in a circle being instructed in meditation by a leader, I mused on something else. When the more energetic members set out to dance on the lawn during the summer solstice I

remained in my seat, and thought about being very young again and in enthusiastic search for exotic intellectual pleasures, here masquerading under the disguise of terribly important spirituality.

Although it might have been amusing to draw out these zealots by pretending to be at one with them, I preferred not to engage in deceit but reminded them from time to time of my Christian position, usually encountering some pitying protest. It was evident that most of them had spent years of internal argument in arriving at their formed opinions and would not be lightly shaken, especially not those who had made a career of it, or attracted a following to themselves.

I have the impression, from the occasional momentary expressions of uneasiness that I sometimes saw flitting across a face, that some of these dabblers in the occult are perfectly aware of their frenetically imaginative states and would be only too happy to return to the milder beliefs of their Childhood. But they have become entrapped in the self imposed logic of their complex games. A perusal of Jan Huizinga's *Homo Ludens* (Man Playing) might have revealed to them the temporary and frivolous nature of their activities and saved them from painting themselves into corners, of the sort that can only be escaped by completely repudiating a whole system of belief, with the resultant public embarrassment at one's paint-splotched plight.

These excursions have proved to be both satisfying to my analytic urges and to a desire for company in this nearly empty stretch of countryside I suspect that most of the people I encounter are motivated by similar wants. For they are exuberantly friendly and welcoming, and on days where there are few attendees they all jump chattering in to dissipate the gloom and get the party going. Certainly I have never encountered more talkative people.

Ann Kucera

Ann : This is a most fascinating piece. I have always felt slightly embarrassed at holding religious beliefs because of what I had perceived as a general rationalism within society and a feeling that, if one claims to have some nostrum that is the ultimate cure for all ills - the complete answer to the "what's it all about then" question - then one ought to have it all worked out much better than I ever did. I often argue with sceptics (of the "all religion is tosh" school), who say that they have a hard time getting through to people in a society where religion is rife, with the point that society is becoming increasingly secular. From your experience, the opposite seems to be the case.

As for small religious groups, - I was, for some years, a member of The Berean Forward Movement, an ultra-dispensationalist Christian group (the name comes from the Bereans in Acts 17:11 who "searched the (Old Testament) Scriptures daily to see whether what Paul (the Apostle) said were so". This group concentrated very much on Bible study in order to derive sound doctrine from it; doctrine, of course, that the sloppy exegesis of the mainstream churches had missed. It involved "seeing the

mystery" as the expression went. A "mystery" (from the Greek mysterion) being a sacred secret revealed by God. This mystery (revealed to the Apostle Paul and expounded by him in such books as Ephesians) was that God had temporarily interrupted his plan of salvation centred on Israel (the Jews, not "the Church") and was dealing with gentiles independently of the Jews until the latter would be restored to favour at the end times after passing through "the great tribulation". We didn't think of ourselves as altogether distinct from the rest of evangelical Christianity - who were "weaker brethren", even though part of the elect - but as "an election within an election", or so went the party line. The group attracted a number of highly intelligent individuals who "weren't getting anything out of their local churches", but also, as it was a social group with families, a number of members who didn't really understand the doctrines very well, or at least couldn't derive them. While the movement was founded (in the early 1900s) by a couple of fairly charismatic individuals, they didn't pretend to private revelation but only to have seen something in the Scriptures that was already there. In fact, the movement was dead against "raving Penties" (meaning Pentecostalists). Being a small group (albeit with tiny branches world-wide - this added to the exclusive aura) we were always very welcoming of newcomers - though I think we'd have quickly spotted the roving sociologist.

Incidentally, was your title a reference to Legion in Mark 5:9 ?

Theo

21st August 2000 **Anthony Owens**

DETERMINISM

I suppose I could reply to Roger Farnworth by saying that I see no point in replying to anyone who calls me a Nazi, but then with abortion, and human cloning for cannibalised spare parts, spotting Nazis is getting quite difficult these days. I could even accuse him of not having read my response in the light of his claim that there has been no '*argument to support free will*'.

Instead, I hope he will permit me to re-phrase my questions. Let us imagine a hypothetical situation involving a human and an android. The details of the structure and capabilities of the android are unknown to the human. They each have the exclusive need of a piece of equipment in order to survive. The materials to make it are to hand but are only sufficient for one and there is no prospect of obtaining any more.

If the human makes it for the android would this demonstrate genuine compassion, or foolishness? If the android makes it for the human would this be an example of its compassion, or its programming? If the human's actions are determined, is there a difference between the human and the android? If there is, what is it, and how would you account for it? If there isn't, please return to my previous questions.

You might say that the android was made deliberately by a civilisation; and the human accidentally by evolution; but I see no essential distinction between your 'determined' human and the android.

Anthony Owens

Anthony : I don't want to interfere in the discussions between you and Roger. However, I'd like to raise a question about why you should think determinism or free will has anything to do with why we should do anything for another being. Maybe I misunderstand you, but what is the relevance of whether or not the recipient of the action (rather than the agent) has free will ? Why is it not the case that our actions should be governed by the object of our action's ability to suffer or enjoy the results of our action. Closely confined prisoners at our mercy do not have free will to this extent. Does it not thereby matter whether we do them ill or good ? If the android is so constructed that the quality of life it is capable of is superior to that of (at least some) human beings, then it might not be foolishness to act altruistically towards it, any more than it would be for an individual to sacrifice himself for another human being of superior qualities. The reasons why an android were to perform any specific action would depend on how it is programmed - or how it is programmed to learn. As far as we know, humans are born pre-programmed with generic capacities to enable them to live in communities - eg. to learn languages or to learn moral codes, though the precise forms of language or ethical system are dependent on the environment we grow up in. If an android is similarly programmed (as we might say evolution has programmed us) is there reason to believe there is an essential moral difference ? The clear distinction is, of course, that of quality. Will it ever be possible to write the programs to a sufficient degree of richness for the android to function to the same capacity as a human ? And finally, will it ever be possible for the android actually to be aware - actually to have the experiences that mean that we are not foolish to consider its interests ?

I gather that your article above is supposed to be a reductio ad absurdum. For the reasons just given, I doubt that this is the case.

Theo

22nd August 2000 **Anthony Owens**

COMING UP ROSES

Roger Farnworth (C102) challenges readers to explain '*if there is a difference between the smell of a rose and awareness of the smell of a rose*'. He then adds *(Awareness is not knowledge that I am sniffing, nor is it comparing the scent to other scents ...*). Surely, it is self-evident that awareness of sniffing is not the same as what is being sniffed; and if everything smelled of roses, and no comparison was possible, I could

not know I was sniffing a rose. Roger thus sets us '*free from the impossible task of explaining consciousness in terms of awareness of the world*' by making it impossible.

This is a prelude to his conclusion '*that evolution has ensured that the colonized* (by the causes of sensation) *brain hardware has become ever larger and more complex..., that the environment has fashioned the mind, that consciousness was constructed by light and sound*'. This is certainly fashionable thinking, rather like the idea that building motorways causes traffic. Nothing to do with increasing population or increasing affluence; just build a motorway and it will spawn motor cars like mud was once thought to spawn life.

Fortunately, Roger adds '*I cannot believe this*'. No, nor can I Roger, though I think a clue to resolve this and other problems is in there somewhere. How about '*evolution*', which can be simplified to just 'change'. Why do things change? Science has had a bash at this question but gets stuck sometime around the Big Bang. Want to have a go at it?

Anthony Owens

Anthony : I think you're unfair to the motorway theorists. They don't say that motorways breed traffic, just that opportunity invites colonisation. Along Malthusian lines, as dearth constrains population growth, so plenty encourages it, until the increased number of mouths consumes all the excess. So, fewer motorways discourage driving (as slow modems discourage web surfing) whereas if we increase the possibilities for driving speedily, more people will take these opportunities up. Of course, infinite bandwidth doesn't imply infinite consumption, but removal of a reached constraint will always result in increased activity. It is a two way thing - both opportunity in the population (affluence) and the opportunity to expend that affluence (room to move). So, I suspect with the brain - more cortex means more is done with it.

Theo

8th September 2000 **Anthony Owens**

THE MEANING AND PURPOSE OF LIFE

I have been reading and re-reading *Commensals* .... whilst my re-reading was proceeding I again came across your challenge on the above title and decided to take it up. You will note that I too adhere strictly to the word count, though I think I get fractionally nearer than you did.

> As an unashamed and vigorous defender of belief in God, I believe that mankind's purpose is to serve God.

I believe that God at least set in motion a train of events which can in general be termed evolution. These events can be relied upon to explore all possibilities and the result to date is a species called mankind which can recognise those opposites which we know as good and evil. The act of recognition, and application, both of which are unavoidable, be that through revelation or tradition, secures the separation of primeval opposites which could, in theory only, result in total annihilation.

I believe that the ground of reality is consciousness, which is not mere awareness, but awareness of awareness. We are eternal consciousnesses, and as such a mirror of the eternal and infinite consciousness of God. The world is an illusory existence but regardless of its distractions we apply the perfect solution of the perfect being: God. Our part in the real existence when we die is up to us. Now!

Anthony Owens

Anthony : Thanks for the above offering. On reflection, while the 50 or 100 word-limit is fine for an evening in which a dozen or so of these world-positions have to be got through, the limit has a tendency to make a solitary offering look rather trite. While it is nice to know this information, it comes over as unreasoned prejudice unless followed up with some justification. This was attempted (though not recorded) at Braziers. Incidentally, Leslie Haddow had the missing papers and has printed them all in *The Round*.

Theo

November 1999 - July 2000 **Bob Cooper**

THE RANQUE EFFECT

KEY TO THE MYSTERIES OF THE UNIVERSE ?

In 'Is the sun hot?' (November 1999's Mensa Magazine) Richard Milton[3] presents a brief account of the Ranque tube and the work of Boscali. He suggests this offers a better explanation of how stars are formed. It offers better explanation for wider events than this.

[3] The text of this article appears below

The phenomena could have bearing an how planets are formed, but could it influence the climates of formed planets? Could it explain the markings of gas giants like Jupiter?

What of novae and supernovae? Why do neutron stars or Black Holes remain after this manifestation? Why didn't these stars blow themselves to oblivion? Why did they take so long before they blew up? Why was something left behind?

Do the dense cores of these stars act like damping rods in a nuclear furnace, until, so super-cooled by the Ranque effect, they develop superconductivity? When this happens will it not be as if the damping rods had suddenly been withdrawn. Would not the reactions in the shell be uncontrolled and explode on a scale related to the size of the star?

The same force of explosion observable from the outside would also be directed inwards at the core. Because of this inward acting force less mass would be required to produce a black hole.

One might wonder if super-cooling of cores precludes the existence of Wormholes and White-holes. But moving on....

Could Ranque have a bearing on the creation and end of the Universe? Does it give a clue as to what happened to the missing antimatter?

I imagined a 'body' consisting, not of matter and anti-matter, or even of quarks, but of some pre-quark material. This would become a hodge podge of assorted quarks, and then a mix of matter and anti-matter, but not a nice, even mix but random masses of each material. When opposites came in contact they would not be totally destroyed. The energy created by the first contact would keep them apart.

Sooner or later, chance will allow the core and the shell to become prominently matter or antimatter. In the case of our universe the core came to contain more antimatter than matter. Once this happened more and more antimatter would be accepted into the core whilst matter would be held at bay by the energy of contact.

With the appearance of matter and antimatter must come a form of space and time; a space and time not as we experience it but something compressed and alien. To our senses events would be instantaneous.

Existence in this new universe is mainly only potential. For instance, beyond the compressed time and space is a potential event horizon of this 'primeval atom'. It cannot have existence because it is outside of time and space. Unless it exists the developing 'primeval atom' cannot become a Black Hole. This is important. If the primeval atom were to become a Black Hole why should it behave then any differently from any other Black Hole? Why should it go 'Bang'?

If this primeval body is not already doing so, it now begins to spin and the Ranque effect makes itself felt. The antimatter core begins to cool and matter shell begins to heat up.

The core would also produce a second potential event horizon inside the first, but still beyond the compressed time and space, so as yet the core cannot become a Black Hole.

Matter and antimatter is still destroyed producing enormous quantities of energy, but some matter continues to reach the 'safety' of the shell and some anti-matter that of the core. The core is becoming super-cooled by the Ranque effect and will acquire superconductivity. When this happens the shell will explode. At this time the body would be spinning at such an enormous rate that it would be disc shaped. Most of the explosive force would be expended along the plane of the spin. This would result in a flattened universe.

This Big Bang would compress the core still more which would bring its potential event horizon 'closer' . The shell would begin its expansion, and time and space would become more like the time and space that we experience.

As the bulk of the expanding shell passed the potential event horizon of the anti-matter core, this horizon would become a reality and the core which has been left behind would become a Black Hole, sealing in for the lifetime of the Universe the balance of anti-matter.

Time and space, meanwhile, drives on towards the original potential event horizon it can never reach. At the instance of the explosion this horizon began to move away as the average density of the Universe fell. As the Universe continues to expand and become less dense it will keep an doing so forever - unless some other phenomenon were to manifest itself. This explains the recently observed distant galaxies accelerating away from us: Gravitational effects on them are lessening and there is no real event horizon.

What phenomena could end the Universe? When the average density of the Universe becomes too 'thin' to support space and time, will the clock stop?

The anti-matter Black Hole, because it is at the centre of the Universe, and because of its very size and its super-cooled core, will be the most vulnerable body. Immediately outside of itself the space and time which played a part in maintaining its event horizon's existence will either have disappeared or become too weak to support the event horizon's position. It will move towards the core. As it reaches the surface of the core all space, time and matter within its boundary will have disappeared into the core. The core will shrink and the event horizon will follow suit until it pops out of existence. Half the mass of the Universe and its contribution to gravity and the Universe's density will have ceased to be.

The effect on the rest of the Universe will be catastrophic. (If there are any observers around to whom 'catastrophe' has meaning.) Time and space will disintegrate into

isolated islands around galaxies and former galaxies. There can now be no relationship between these galaxies and never will be again. They become black holes with their own event horizons. Like the antimatter care at the centre of the Universe these event horizons will shrink, driving all time, space and matter into super-cooled cores. Each will 'pop' out of existence and with the last 'pop' the last of the Universe will be gone.

Perhaps each 'pop' might leave behind an anomaly, a Super Potential for a new Universe. Why not? We don't know what brought our Universe into existence.

Bob Cooper

Postscript : **Richard Milton's article from Mensa Magazine (November 1999)**

Is the sun hot? The question is, on the face of it, almost insane. No-one could possibly doubt that the sun is the only source of external heat on earth. And, certainly, the part that we see, the sun's photosphere, is some 5,800 degrees Kelvin. The solar corona, which extends into space, may be as hot as one million degrees Kelvin.

But what exactly is underneath this hot atmosphere? The explanation universally accepted without question is that it must be an even hotter mass of hydrogen gas, fusing into helium and other elements at temperatures of 15 million degrees Kelvin in a continuous thermonuclear explosion - a giant H bomb.

This universal view is based on the mathematical work of Arthur Eddington in the 1930s and Hans Bethe's theoretical confirmation in the 1950s (for which he won a 1967 Nobel prize). Above all, we have the awesome experimental confirmation of the nature of nuclear fusion by the test detonations of H bombs in the Pacific.

However, physicists have always been aware of nagging problems with the conventional view of how stars form and how they burn. And now, Italian physicist Renzo Boscoli, has published details of a theory that is staggering: the theory that far from being hot underneath its atmosphere, the sun may, at its core, be a ball of ice in which not hot, but cold fusion reactions are taking place.

The conventional view of how stars form is that a cloud of interstellar hydrogen collapses under gravity until, under enormous pressure, the atoms of hydrogen become so hot they fuse to form helium. Once ignited, the core of the newly formed star burns continuously, transmuting hydrogen to helium, helium to carbon and so on, until the fuel is exhausted and the star's life is over.

There are some problems with this view. For instance, when gases are compressed, as under gravity, they also heat up, and this makes them expand. As temperature increases, the outward force, due to expansion, will become greater than the force of

gravity compressing the gas and the gas will simply dissipate in space again. How then could the condensing hydrogen cloud ever ignite spontaneously?

There are many other puzzling features of the sun: how can a surface at 'only' 5,800 degrees Kelvin give rise to a corona of one million degrees Kelvin? Why does the surface rotate faster at the equator than at higher latitudes?

Why does the planet Mercury have a strangely perturbed motion? In two ground-breaking papers published in *Infinite Energy* magazine, Renzo Boscoli offers some astounding answers to these puzzles. Boscoli points out a phenomenon discovered in the 1930s but - like many such anomalies - virtually ignored since. French physicist Georges Ranque discovered that if you make a body of gas rotate, as in a turbine, the hottest (most energetic) molecules are somehow separated to the outside of the mass, while the gas at the centre gets colder, It is relatively easily experimentally to make a 'Ranque tube' where the difference in temperature between air in the middle and air at the outside is more than 100 degrees C, simply by causing the air to rotate.

This experimental result appears to contradict the laws of thermodynamics and at present remains unexplained. But Boscoli points out that its implications for the formation of stars may be immense.

While a cloud of hydrogen condensing under gravity is an unlikely candidate for a new star because heat would make it expand and dissipate again, a rotating cloud of hydrogen would give rise to a remarkable object - one where the temperature at its exterior would continue to rise while the temperature at its core would continue to fall. At first the hydrogen core would become so cold it would liquefy and finally solidify.

Says Boscoli, "If this mass of gas... would begin to rotate upon itself, it would necessarily assume a progressively flatter ellipsoidal form as its rotational velocity increased. And... the Ranque effect would begin to be exerted, therefore producing a cooling at the centre and a heating of the periphery of the ellipsoid".

He adds, "Due to a constant Ranque effect I see no reason why the centre would not continue to cool towards absolute zero."

Boscoli first conceived his ideas some 30 years ago. He has published them for the first time because the Arecibo radiotelescope has reported finding an enormous hydrogen cloud that is very cold (around minus 200 degrees C) and that is rotating on its own axis.

Boscoli goes onto add that nuclear reactions such as that of the H bomb are impossible at absolute zero. But he believes that 'cold' nuclear fusion reactions may be possible due to the immense gravitational pressures.

The reaction he envisages is that of the gravitational collapse of a proton and electron, producing a neutron.

Boscoli's theory solves the problem of Mercury's strange orbit and the sun's differential rotation. It also explains sunspots as simply holes in the atmosphere. If Boscoli is right, there may after all, be something new under the sun.'

Further details appear on Richard Milton's Web Site at:-
http://www.alternativescience.com and he will be pleased to answer any questions by email at richardmilton@alternativescience.com

November 1999

Bob : Thank you for your thoughts, so long in the gestation. I am not a physicist, so cannot authoritatively comment on either your or Richard Milton's speculations. I tried posting the article on PDGList in the hope of getting a bite, but no-one was willing to play. Maybe someone will respond this time when they see the articles in print. I have to say a couple of things though. Firstly, while these speculations are of some philosophical interest they are mainly concerned with physics, so maybe ought to be printed in PhiSIGma where there is more hope of a response. Secondly, and I'll now follow up on this presently, I'm uncomfortable about this approach, so popular in Mensa, of layering speculation on top of speculation, with little sound understanding of what's going on.

Reading Milton's paper, it sounds as though the Ranque effect is fundamentally a two-dimensional phenomenon - he refers to "the Ranque tube"; ie. it works in a rapidly rotating cylinder of gas. Maybe Boscoli has some explanation, but does the effect work in spherical bodies that rotate slowly ? Alternatively, if the Ranque effect forms when they rotate rapidly, is it still stable when they slow down, and what is the mechanism for their loss of angular momentum to allow this ? I feel the need for some mathematical modelling here - something notably absent from speculations.

You commence with a host of rhetorical questions, but do not indicate whether or not orthodoxy has any answers to them, nor whether your theory has any answers. Orthodox science often has hand-waving answers to questions where the detailed answer is unknown, but I dare say some sort of quantitative sketch of the answer, albeit incomplete, could be supplied. Can you do likewise ?

I'm not impressed by your vision of pre-quark material. For this to be a speculation forth its salt, don't you have to be able to say something about it, and how it's supposed to clump together into matter and anti-matter ? Why do you suppose that such clumps are kept apart by "the energy of contact" ? Do you have some sort of image of a lump of sodium fizzing about in a beaker of water ? I'd have thought a Zeppelin explosion a better model, only with a bit more pop. This makes your segregation of matter & anti-matter into core & shell rather unlikely.

And where does this compressed space and time come from ? What's this supposed to mean ? You lost me with your "primeval atom" idea. How does your primeval body suddenly start spinning ? Bodies do this under gravitational collapse to conserve their

net angular momentum, but is your primeval body collapsing, and where did its angular momentum come from ? You refer to the body spinning at an enormous rate, leading it to become disk-shaped and resulting in a "flattened universe". What is this supposed to mean ? It is tempting to think that you are alluding to space-time being "flat" or nearly so - but this is a four-dimensional concept. The term "flat" is used by analogy with a two-dimensional surface. In four dimensions it does not imply disks or any other two-dimensional flat structure.

What are "potential event horizons" supposed to be ? An event horizon either is or isn't one, and it can only be passed in one direction - inwards - by definition. I liked the idea of hiding the antimatter away at the centre of a black hole, it's just that your mechanism for its production takes a bit of swallowing. Just why our universe consists primarily of matter does need explaining, but I'm not sure your explanation doesn't introduce concepts that require even more explanation.

I could carry on but space and time do not allow it.

Theo

February 2000 **Frank Luger**

THE ENIGMATIC NATURE AND 'MYTH' OF TIME

An Original Research Essay by
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Abstract

The notion of time was introduced as a perplexing, paradoxical problem. Several historical conceptualizations of time were briefly surveyed, from the pre-Socratic philosophers to Alfred North Whitehead. Some physical dilemmas of time were mentioned, such as the metric of uniform time flow, the causal and irreversible notions of time order, as well as absolute and relative distinctions. Certain psychological problems of time were also touched upon, such as measurement, individual time-sense, time experience, the 'present moment' as the unit of subjective time, private time as a continuum, the irreversibility of psychological time, and the notion that time cannot be halted. Several conceptual difficulties of time were noted. Following these enigmas, the 'myth' of time was mentioned as having arisen from surplus meanings and a certain 'deification' of time. Finally, it was suggested, that since *change* (and thus *motion*) is both *necessary* and *sufficient* for the notion of time; perhaps, for the sake of conceptual elegance, time could be 'reduced' to a particular form of change.

Introduction

"Quid est ergo tempus?

Si nemo ex me quaerat, scio;
si quaerenti explicare velim, nescio..."

St-Augustine, *Confessions*,
Book XI, Chapter XIV,xvii.

"What is thus time? If nobody asks me, I know; if I want to explain it to somebody, I do not know...". These were some of St-Augustine's lamentations over fifteen centuries ago. Today, much scientific research and even more philosophical discussion notwithstanding, St-Augustine might not be able to arrive at a better result or a different conclusion. Time is still an enigmatic paradox, and a rather perplexing one at that.

In the most general sense, time is an *abstraction* that denotes both *duration* and *succession*; and connotes the *measurement* of these phenomena. However, if an attempt is made to analyze these notions more precisely, they are found to be riddled with epistemological and metaphysical difficulties. Yet, the concept of time itself seems to survive logical scrutiny, no matter how rigorous. Is this because of its elusive nature? Or its pragmatic usefulness? Or, perhaps, the lack of a more adequate conceptualization?

The purpose of this essay, then, is the discussion of the enigmatic nature of time. Following a brief survey of some of the major historical conceptualizations, both physical and psychological 'times' will be very briefly examined; and mention will be made of its 'deification' or promotion to 'mythical' status in lay vulgarizations. Finally, it will be considered, albeit in a cursory fashion, whether time may be meaningfully reduced to *change*; and some of its conceptual problems effectively solved thereby.

Some Historical Notions of Time

Although the first written record of Man's attempt to *measure* the cyclic recurrence of diurnal and nocturnal periods as well as seasonal changes dates back to the Sumerian civilization around 3,500 B.C.E. (Lloyd, 1966), the first written record of Man's attempt to *understand* such changes is some three thousand years more recent. Specifically, it was during the pre-Socratic era in ancient Greece that the first (recorded) philosophical discussions of time had taken place.

Among the preoccupations of the pre-Socratic philosophers was the discussion of the ontological status of *becoming* or *change*, versus *being* or *permanence*, corresponding to the two most generally observed phenomena, i.e. instability vis-a-vis stability in Nature, respectively (Benjamin, 1966). Heraclitus (cca. 500 B.C.E.) asserted that reality is flux and constant change (hence his famous saying that 'one cannot step into the *same* river twice'; e.g. Kaufman, 1961, Vol. I, -fr.41); while Parmenides (cca. 540 B.C.E.) and Zeno (cca. 460 B.C.E.) argued that only the permanent is real (Kaufman, 1961).

Plato (428-347 B.C.E.) attempted to resolve the controversy by postulating a common Universe for all phenomena, comprising material change and ideal permanence, or

instability within a framework of stability. Aristotle (384-322 B.C.E.) affirmed the reality of *time as motion*; and defined time as the number of motion in respect to 'before' and 'after'. In other words, for Aristotle, *time is a measure of motion* (e.g. Benjamin, 1966; Kaufman, 1961; Russell, 1945; etc.).

The early Christian philosophers, Plotinus (204-269 C.E.), St-Augustine (353-430 C.E.), and St-Thomas Aquinas (1225-1274) discussed time somewhat reminiscently of Plato and Aristotle. However, their preoccupation with theology led them to emphasize the timeless or eternal nature of God; and thus shift focus to 'otherworldly' concerns (Russell, 1945), generally along the lines of the static philosophy of the Middle Ages and the renewed interest in Nature during the Renaissance (Kaufman, 1961).

The British empiricists in general, and John Locke (1632-1704) in particular maintained that *time is quantified change* based on the experience of duration and succession, whether subject to human sense-perception or not (Russell, 1945).

Newton (1642-1727) introduced the notion of absolute time (together with absolute space) as an independent dimension, somewhat akin to a steadily flowing river; and affirmed its reality, regardless of human existence. His intellectual adversary, Leibnitz (1646-1716), maintained that time is ideal and potential, whose essential feature is succession; and as such, paved the way for the later intuitionism of Kant (Benjamin, 1966; Kaufman, 1961).

Immanuel Kant (1724-1804), reacting to the British empiricists, asserted that time is an *a priori* form of intuition (perhaps reminiscent of an innate category of the mind), which compels the perception of a temporal world (Benjamin, 1966; Russell, 1945).

The post-Kantian era saw the re-emergence of philosophical emphasis on *change*, roughly paralleling the emergence of the biological theory of evolution, before, during, and after Darwin. Philosophers, such as the German idealists (Fichte, Schelling, Hegel), positivists (Comte, Spencer), materialists (Feuerbach, Marx, Engels, Vogt, Moleschott, Büchner), as well as their followers and elaborators, adopted a dynamic viewpoint, somewhat reminiscent of Heraclitus and Aristotle. Darwinian evolutionary theory, in particular, seemed to suggest that *change is the essence of reality;* and enormous stretches of time were required, in a uniform sense. Time was conceptualized accordingly, although cosmogonical problems indicated that time could not be denoted as being synonymous with change (Hodgson, 1865, Russell, 1945).

Henri Bergson (1859-1941), the philosopher of 'emergent' evolution, was convinced that time is the key to reality. He distinguished *duration* and *spatialized time*, corresponding to intensive and extensive quantities, respectively (Benjamin, 1966; Russell, 1945). William James (1842-1910) identified the unit of time as a duration block (James, 1962; Russell, 1945).

Samuel Alexander (1859-1938), perhaps one of the thinkers who undertook most comprehensive and painstaking analyses of time (Benjamin, 1966), asserted the

space-time dimensionality of pure events. He maintained that space is temporal, time is spatial; and so, maybe space-time is the categorical basis of all things (Alexander, 1920; Brettschneider, 1964).

Relativity Theory and Quantum Mechanics had given rise to much philosophical analysis of time. Einstein's Special Relativity demonstrated the untenability of the absolute-time notion (Barnett, 1957, Einstein, 1961; Hawking, 1988). Quantum Mechanics called attention to the fundamentally discrete units of energy (which probably influenced Wittgenstein, who conceived of time-quanta, cf. Whitehead, 1965), and the relationship between matter and energy (Hawking & Penrose, 1996). Nevertheless, the reality of time was asserted, albeit in a relativistic sense (Reichenbach, 1958, 1966).

Alfred North Whitehead (1861-1947) conceptualized time as the interplay of three fundamental categories; those of supersession, prehension, and incompleteness. No concrete entity can change, it can only be superseded. Supersession is a three-way process; each occasion supersedes other occasions, it is superseded by other occasions, and it is internally a process of supersession, in part potential, and in part actual. Prehension expresses how the World is a system of organisms. An occasion is a concretion- i.e. growing together of diverse elements that is why each occasion is an organism. Prehension is blind physical perceptivity. 'Incompleteness' refers to the fact that if anything were complete, the World would be not only static but timeless as well. Every occasion holds in itself its own future. Time has to be conceptualized as epochal (discrete, categorical), otherwise the phenomenon of infinite regress must be accounted for (Whitehead, 1965, 1967; Lucas, 1973; Schwarz, 1972).

It is worth recalling at this juncture that according to Kant, we cannot form the concept of time from our observations or experiences of events happening successively, etc. (i.e. we cannot derive time from phenomena) since the notions of succession, simultaneity, etc. *presuppose* time. For Kant, time cannot be an *a posteriori* concept.

However, following Einstein's unified concept of spacetime, Schrödinger (1956, p.250) felt that: "...the fact remains that time no longer appears to us as a gigantic, world-dominating *chrónos*, nor as a primitive entity; but as something derived from (the regularity of) phenomena themselves. It is a figment of my thinking..."

Figment or not, the ontological status of time remains unsettled: time is still an enigma, and a rather baffling metaphysical one at that.

Some Physical Problems of Time

Among the traditional concerns of physics, the *measurement* of things or events has, since Galileo, always been of great importance. Thus the physicist would first assume the reality of time, whether explicitly or implicitly, then conceptualizing time as proceeding by uniform 'flow', he would endeavor to measure it. Having observed the uniform alternation of diurnal and nocturnal periods, and knowing that these periods can be explained by the rotation of the Earth with respect to the Sun, the physicist

might hypothesize that a measure of these periods would yield an accurate yardstick of time (Reichenbach, 1966).

To his dismay, the physicist discovers that his measure is not quite uniform, because the Earth rotates on an elliptical rather than circular orbit. To remedy this situation, he then endeavors to measure the Earth's rotation with reference to a distant (fixed) star. The first measure is called *solar*, while the second *sidereal*, time (Reichenbach, 1966). However, he soon discovers that even sidereal time is not exactly uniform, because of the precessional motion of the Earth. Although this motion is very slow, taking about 25,000 years for a complete turn, its observation deprives the physicist of saying that sidereal time is truly uniform, flow (Lloyd, 1966). Also, there always *are* inaccuracies and imprecisions in every measurement.

Not even the most modern cesium clocks (atomic half-time clocks) permit an unequivocal conclusion as to the uniformity of time 'flow'; and although some deviations might be negligibly small, they are there, nevertheless (Lloyd, 1966).

The philosopher, who has been lurking around the corner during these measurements, now pounces upon the problem and points out that what the physicist calls uniform time, whether truly accurately or not, is not directly observable, but must be derived by complex mathematical computations. Therefore, time is a relational concept; and 'uniform time' is merely an abstraction that the physicist has *imposed* upon observed data (Reichenbach, 1958, 1966).

Furthermore, laments the philosopher, the mathematical operations themselves rest upon the so called 'Laws of Nature', which, irrespective of their ontological status, were derived with reference to uniform time. This is a curious situation. To know uniform time the Laws of Nature must be known; and to know the Laws of Nature uniform time must be known. This circular reasoning, although not a fallacy *per se*, leads nowhere (Reichenbach, 1966; Lucas, 1973).

The physicist retorts by saying that he is not concerned with this tautology, since he did not ask whether the uniformity of time was epistemologically true, but he *defined* astronomic time as uniform. In short, argues the physicist, whether there is truly uniform time or not is not his business; he simply calls a certain measured flow of time uniform in order to possess a measurement standard for other 'times', such as non-uniform time, cyclic time, and the like (Reichenbach, 1966; Bieri, 1972).

The metric of time, thus, seems to be merely a definitional matter. Yet a definition is no proof of existence (Hospers, 1967; Russell, 1967). Even the most 'adequate' definitions of a perfect woman or a perfect unicorn, for examples, fail to prove that they exist. Pity (I mean the woman, forget the unicorn).

Another problem of great concern for both the physicist and the philosopher has been the *order of time* (Gent, 1965; Herrmann, 1971; Meerloo, 1970; etc.). What does it mean that event A was earlier than event B? More importantly, how can the order of time be *known*? Measurement alone is insufficient, even if it were absolutely reliably and validly performed.

The physicist affirms that *causal* relations reliably and validly indicate a time order, since a cause must perforce precede an event, and *per definitionem* at that (Goeje, 1949, 1951; Grünbaum, 1963; Schwarz, 1972). Not so, argues the philosopher; because there are simultaneous as well as two-way causal relationships (Grünbaum, 1963; Sellars, 1962; Wallis, 1968). Furthermore, causal relationships are *not immutable*. For example, although event A usually caused event B, now A causes B, C, and D in such a complicated pattern that the time-order is obscured. Finally, if the Universe were timeless, causal serial orders would disappear. Precisely so, expostulates the physicist; this is the *confirmation* that time exists, since it reflects the causal order of the Universe. Immutable or not, obscure or not, *a causal order specifies a time order*. Therefore, a simultaneous relationship, in the sense of the above definition, is not causal; but concomitant, or covarying (Hospers, 1967; Sellars, 1962).

Furthermore, argues the physicist, *irreversible* processes also indicate a time order. If state A has irreversibly become state B, state B must have occurred later than state A, according to the Laws of Thermodynamics, especially the Second Law (Blum, 1968; Cleugh, 1937; Koestler, 1967; Layzer, 1975; Lucas, 1973; Ornstein, 1969; Prigogine, 1967; etc.). However, the philosopher, on his turn, points out that this is again a tautology, since the Laws of Thermodynamics were derived with reference to time order, without which the notion of irreversibility is incomprehensible. The physicist escapes this dilemma by maintaining that *irreversibility defines time order*, thus the observations and experiments from which the Laws of Thermodynamics were derived, were valid (Cleugh, 1937; Grünbaum, 1963; Lucas, 1973).

It would therefore seem to be the case, that the order of time is a matter of definition (Monod, 1971; Reichenbach, 1958, 1966; Schwarz, 1972; Wallis, 1968; etc.); namely, that of causality and irreversibility, as mentioned above.

Finally, in order to be a reliable standard, time would have to be *absolute*, or universal, to which no exception could be made. In other words, if time reliably indicates units of duration and succession, this indication should be valid everywhere and everywhen. However, the phenomenon of *time-dilation* (Shklovskii & Sagan, 1966; Sagan, 1973; etc.), according to which the passage of time is inversely related to the speed of travel, shows that time is not absolute but *relative*, as shown by the Special Relativity Theory of Einstein (Barnett, 1957; Einstein, 1961; Kaufmann III, 1973; Nordmann, 1925; etc.). The Big Bang theory of current cosmology, black holes and singularities, and similar phenomena also argue against absolute time and in favor of its relativity (Hawking, 1988; Hawking & Penrose, 1996; etc.) .

To recapitulate, in the physical sense, time seems to be a relative notion that measures durational and successional aspects of (regular or irregular) physical change, whose uniformity and order are matters of definition (Grünbaum,1963; Lucas, 1973; Reichenbach, 1958; etc.).

However, since the *knowledge* of time is *not a priori*, but the result of definition and indirect observation; *time is real only in the sense that space is real* (Reichenbach,

1966). That is, physics seems to have been unable significantly to contribute to the elucidation of the metaphysical nature (ontic status) of time. All that can be said on the basis of physical knowledge with an acceptable degree of confidence is that *if time exists, then it exists.*Once again, this is a tautology.

Some Psychological Problems of Time

According to Reichenbach (1966, p.144):

> "Time is one of the most conspicuous characteristics of human experience. Our senses present us their perceptions in the order of time; through them we participate in the general flow of time that passes through the Universe, producing event after event and leaving its products behind itself, crystallizations of some fluid entity that was future and now is unalterable past. We are placed in the center of the flow, called the present; but what now is the present slides into the past, while we move along to a new present, forever remaining in the eternal now. We cannot stop the flow, we cannot reverse it and make the past come back; it carries us along relentlessly and does not grant us a delay..."

This eloquent description well summarizes the main features of *psychological* time; time is experienced as a flow (of events), time perception is dependent on sensory events, time is a continuum made up by units called 'present', time can be directly experienced only by such units, a unit can be experienced only once after which it is labeled 'past' and before which it is called 'future', time is irreversible, and it cannot be halted.

The measurement of psychological time is almost impossible without reference to some external standard, be it a clock, an observed physical change, etc. (Priestley, 1964), as shown by sensory deprivation studies (Murch, 1973). Furthermore, even in the presence of external standards, estimates of subjective or private time can be greatly influenced by cognitive, motivational, emotional variables, as well as psychopharmacological agents, such as hallucinogenics, etc. (Bieri, 1972; James, 1962; MacIver, 1962; Meerloo, 1970; Murch, 1973; Orme, 1969; Ornstein, 1969; Shibles; 1969; Stuart, 1925; Wallis, 1968; etc.). Even cultural factors may make a difference (Anastasi, 1958).

The susceptibility of the individual sense of time to external and internal variables renders it notoriously unreliable as demonstrated by controlled experiments and observational studies (Meerloo, 1970; Murch, 1973; Orme, 1969; Wallis, 1968; etc.). In the absence of timekeeping devices, idiosyncratic time estimates can be grossly inaccurate. Even the so-called biological clock may be misleading by as much as several hours, depending on external and / or internal factors (Meerloo, 1970; Wallis, 1968). Psychological time *must* be externally measured with a reliable and valid yardstick, any and all personal experience notwithstanding.

Time as such cannot be experienced (Bieri, 1972; Lucas, 1973; Ornstein, 1969). Only observed environmental change, whether external, internal, or both, can be experienced. Furthermore, conscious awareness is necessary for such experience; since, as Aristotle has already observed (Benjamin, 1966), an individual in deep sleep cannot experience time at all. Thus, it has been suggested (Hodgson, 1865; James, 1962; Lucas, 1973; Shepherd, 1941; Stuart, 1925) that time is an essential concomitant of (human) consciousness. However, this suggestion would be valid only if time and consciousness existed separately and experienced environmental change could be conceptualized as an intervening variable between them. Since neither time, nor consciousness have been demonstrated to exist by themselves; i.e. time existing independently of physical change and consciousness existing independently of its neocortical 'host', this suggestion, as worded above, is clearly fallacious.

If the 'present' is a 'legitimate' unit of psychological time, then it should be observable, or otherwise experienced. However, what is 'present', depends on the level of observation. Present century, year, season, month, week, day, hour, minute, and second seem to indicate that there is such thing as 'present'. Yet none of these can be directly experienced. Furthermore, the smaller the unit of 'present', the less meaningful it is to call it present. Before a second can be designated as present, it has already passed. Neural transmission occurs in milliseconds, and photons travel even much, much faster than action potentials. Strictly speaking, this puts the observer in an odd situation: as his eyes wander about he cannot *know* whether he sees present or past. As James (1962) suggested, no matter how fast the observer repeats: 'present' 'present' 'present' or 'now' 'now' 'now', by the time he utters 'now' he is already in the future. Perhaps the 'present' does not exist at all, but the future immediately melts into the past, through a narrow bottleneck, as it were. Or, if it does exist, maybe it does so on such a miniature scale that it cannot be perceived. There's no evidence to suggest that time may be discrete or quantized, at all.

Psychological time may thus be better conceptualized as a *continuum*, rather than a chain of discrete quanta or 'present' units. However, as Whitehead (1965) has pointed out, if time is a continuum, and such questions as the beginning and end of time can not be answered, then the philosopher is faced with the problem of infinite regress and infinite divisibility. But does it make sense to say that time is timeless, and that time can be infinitely subdivided? Especially if, following the theories of Einstein, time is thought of as relative rather than absolute?

Whether time is conceptualized as continuous or categorical, it is said to be *irreversible* (Cleugh, 1937; Stuart, 1925). However, this is a physicalistic notion, which is not necessarily true in the case of psychological time, as demonstrated by sensory-deprivation experiments (Murch, 1973). Also, depending on subjective factors, temporal relationships may easily be perceived as reversible (Gent, 1965; Lucas, 1973; Orme, 1969). Cultural indifference to time may also give rise to reversible temporal experiences (Anastasi, 1958).

Another feature of psychological time is the notion that objectively, time cannot be halted, or reversed. For example, the momentary desire of Dr. Faustus to hold time

still had promptly relegated him to eternal hellfire, as per his pact with Mephistopheles, the Devil (e.g. Priestley, 1964). However, this notion may be entirely culture-dependent (Anastasi, 1958); and may not reflect more than a resignation in the face of such psychological threats as death for example.

In sum, as Lucretius noted (in *De Rerum Natura*, I, 459-60, 462-3; quoted in Lucas, 1973, p.9): "Tempus item per se non est, sed rebus ab ipsis consequitur sensus... nec per se quenquam tempus sentire fatendum est semotum ab rerum motu placida que quiete..." That is, time by itself does not exist, but the sense of time follows from things themselves... nor should it be said that anyone experiences time by itself when he is removed from the calm and peaceful motion of things...

The 'Myth' of Time

Perhaps the notion of time is neither necessary nor really useful, whether physically, psychologically, or both. Whether this is the case or not seems to entirely depend on the various 'arrows of time' and similar conceptualizations. No single, unequivocal, omnibus notion of time is available. Time has been conceptualized in a great many different ways; as duration, as succession, as flow, as passage, as spacetime, as direction, as continuum, as determinism, as absolute, as relative, as cyclic, as irreversible, as causal, as unidimensional, etc. There is solar time, sidereal time, atomic time, biological time, psychological time, etc.; and even notions of timelessness and eternity. Despite a plethora of possible definitions, there is little general consensus as to just what time is (Grünbaum, 1963; Sellars, 1962).

These difficulties, at least partially, arise because of the 'myth' of time. Originally, time meant nothing more than regular change, as for example in ancient Greek philosophy (e.g. Benjamin, 1966; Lovejoy, 1909; Russell, 1945). However, with the scientific-philosophical progress and the theological-cosmogonical considerations of many centuries, time has gradually acquired so much surplus meaning that the original concept is almost inextricably buried in the heap. The initially harmless mollusc metamorphosed into a giant squid whose tentacles reach everywhere and choke the hapless bystander who but needed a protective suit of simple logic to ward off the tentacles. Just what *is* this 'myth'?

The 'myth' of time consists of a heap of superficial and false beliefs that time exists by itself, and that somehow, it is 'omnipotent'. Time takes care of everything, time judges all, time is wisdom, time brings relief, time is merciless, time is inevitable, time will tell, etc. Yet to be able to do even a fraction of these things, time would have to be a supernatural entity, i.e. god. This all-too-common 'deification' of time by most laymen and even by many intellectuals is, regrettably, even exploited for commercial purposes. To have a good time, hard time, noisy time, etc. and similar ‘oversimplifications’ are busily expounded by the advertising and blatantly profiteering mass media which capitalize on the 'myth' of time. As Shibles (1969, p.40) has noted: "...as if time can do and say things, as if time were an entity... a force which can produce effects... manipulate events..."

If time could be stripped of its surplus meanings; and, especially, of its 'myth', it might continue to serve as a reasonably useful and meaningful measure of durational and successional phenomena. The reality of change is, by now, almost beyond philosophical dispute (Hospers, 1967; Lucas, 1973). In the physical sciences, time and its measurements present relatively little difficulty (Blum, 1968; Hawking, 1988; Hawking and Penrose, 1996; Layzer, 1975; etc.); changing paradigms and physical theorizings notwithstanding. Since time can be fairly adequately conceptualized as the measurement aspect of regular change, or the nonspatial order in which things change; it would seem, without committing the reductive fallacy, that time may be safely reduced to *observable, regular change within corrigible error.* Finally, since change is an aspect of motion in general; it may be said that time is but a particular kind of motion.

Since the concept of *change* is both necessary and sufficient for the notion of time, it may be quite reasonably concluded that its enigmatic nature notwithstanding, *time is nothing but a particular form of change,* rather than any kind of perplexing myth.

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Frank Luger

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[4] Note : almost all the references in Frank's original paper are listed here. Given the readership of *Commensal*, a few German references have been omitted.

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17th September 2000 **John Fender**

FREEDOM, INFORMATION & UTILITARIANISM[5]

I doubt if many readers of this Newsletter would deny that it is desirable to accord individuals a large amount of personal freedom and that they should have the liberty to make choices for themselves over a large number of items which impinge upon their

[5] Delivered at the PDG Conference, Braziers Park, May 2000. John tells me that since he didn't keep any notes of his Braziers talk, the write up is based on memory, and may not be too accurate in parts, but doesn't think this should matter too much. I agree ! [Ed.]

well-being. Western (and many other) societies embody such principles, albeit sometimes imperfectly: people are often accorded freedom in their choices of job, marriage partner, friends, political and religious affiliation, place of abode, leisure activities and so on. Of course this freedom is not entirely unconstrained, and there may be good reasons for some constraints, but certain types of interference with people's choices are widely frowned upon.

Also, many of us probably adopt an approach to many social and ethical problems which might be described without too much inaccuracy as `utilitarian', although this is something we might do only implicitly. Our approach may not be too different from the classical utilitarianism of Mill and Bentham, according to which social policy should maximise the sum of utilities of the population. Perhaps we can describe our approach as `welfarist', something which is broader than, although it includes, utilitarianism. The idea is that what matters in evaluating any policy is its effect on people, and its desirability or otherwise depends on these effects. It is hence consequentialist, but a particular type of consequentialism. We can think of whether a policy benefits or harms individuals, obtain some idea of the extent to which it does this and thus obtain some measure of the impact of the policy, which may be thought to be desirable if, on balance, the benefits to those who gain outweigh the losses to those who suffer. Many debates on policy can be put within such a framework. For example, it might be argued that capital punishment is desirable since it deters murder and by so doing saves more lives than it costs. (Perhaps I should add that I do not accept this argument - I wish merely to illustrate the point that many debates and discussions about ethical issues and policies take place within such a framework. An opponent of capital punishment might argue that in fact it does not deter, so that it costs more lives than it saves, and so is unjustified on welfarist grounds, and so on.)

The question I wish to consider in this article is whether freedom can be given a `welfarist' justification. I shall also outline such a justification, and explore some of the implications of these views. But first of all, why is it necessary or desirable to do this? Might it not be argued that freedom is a basic right which does not need defending? But such a position is unsatisfactory. Often, the question of whether someone's freedom should be infringed is raised and we need criteria to help us think about these cases. Examples abound - laws against certain types of drugs, for the compulsory wearing of seat belts and against assisting suicides. These are issues over which reasonable people disagree and we need criteria to help us make decisions on these things.

It might be thought that there is a basic incompatibility between freedom and utilitarianism - that promoting the `greatest happiness of the greatest number' may involve highly coercive, Brave New World type policies. I believe this position is unjustified and that a reasonable defence of freedom on welfarist grounds can be given. The basic point concerns information - how does the government, or whoever carries out the policies designed to maximise utility, actually know what policies will do this? Information is incomplete. But, over and above this, information is asymmetric - all individuals do not possess the same (limited) information. Some people know things that others do not. Furthermore, some of the things people know (but others do not) are important for their well-being. Consider, for example, someone's choice of where to live or marriage partner. The relevant information is quite complex and not at all easy to

communicate - in fact, it may be `tacit' or intrinsically non-communicable. The solution is to allow people to make their own choices about these things. They have an incentive to make the decision they consider to be in their own best interest. Of course there may need to be constraints if the decisions affect the well-being of others. But here, the price system may offer (to some extent) a solution. My decision to purchase something from a supplier at a price he is quoting does impinge on his welfare, but presumably in a positive direction - otherwise, he would not be willing to carry out the transaction.

So the idea is that allowing people freedom over certain actions is an efficient way of allowing the imperfect and asymmetric information that is spread throughout society to be harnessed to the social good. Restrictions on freedom may be justified when people's actions impinge on others' welfare (this point has of course been recognised by many others, most notably Mill), as mentioned above, although ingenious use of the price system may enlarge the area of unconstrained personal choice. What insights does such a view provide into reasons for restricting freedom? It is easy to give a justification for certain restrictions on freedom, for example the prohibition of shouting `fire' in a crowded cinema (unless, presumably, there is a fire). How about arguments for paternalistic intervention? By this is meant interventions of various types designed to protect people from themselves - policies to force people to do things for their own good. The compulsory wearing of seat belts is a good example. One might argue that sometimes, people always do not make fully rational decisions. And occasionally, the consequences of so doing may be horrific. So, I would argue, we may be justified in forcing people to take actions which they would take if they were fully rational and had the right information.

An example may clarify the point. Suppose someone is standing under a tree which, unbeknownst to him, is about to fall on him. He is clearly lacking information about something which is pretty crucial for his welfare! An obvious solution would be to provide the information - to shout him a warning, which will induce him to take the appropriate remedial action. However, one can imagine circumstances where this is not possible - for example, the person threatened by the tree might be deaf or not understand the language spoken by the warner. In this case, it being impossible to convey the information in time, it may be justified to use coercive action by, for example, pushing the threatened individual out of the path of the tree.

This approach, that information, or rather its absence, lies at the heart of the case for justifying paternalistic intervention or coercion (where it is justified), obviously needs further discussion, analysis and debate. However, I would argue that this is the way to analyse the problem. This article is merely intended to suggest that this approach should be explored further.

Coercion may be justified if one person's actions impinge negatively on another's well being. However, what is not always realised is that such constraints or coercion can make everyone better off. This is the message of the celebrated prisoners' dilemma, a well-known problem of game theory. Consider the situation where two prisoners stand accused of a certain crime. Each has the choice between confessing and not confessing. If both confess, both get five years in jail. If neither confesses, each receives one year. However, if one confesses and the other does not then the non-confessor receives ten

years whilst the confessor is freed. It can easily be seen that each prisoner's best action is to confess. If the other agent does not confess, then confessing beats not confessing. But equally if the other agent does confess, confessing still beats not confessing. So both end up confessing, and both go to jail for five years. However, both would be better off if they failed to confess and received just one year in jail. The moral of the story is that individual rationality and free choice may not produce a socially desirable outcome; coercion may make everyone better off; in terms of the prisoners' dilemma, if the prisoners could agree that a confessor gets an additional term of slightly more than five years, they both will rationally fail to co-operate, and hence produce the outcome that is best for the prisoners. Many societal problems can be argued to be, in essence, prisoners' dilemmas. Would we expect individuals to offer to contribute to buy a public good (a good that benefits everyone and the benefits of which cannot be excluded from anyone)? If each agent's contribution does not affect the probability that the public good is provided, then it is rational for each agent not to contribute; however, everyone may be better off if everyone contributes than if no one contributes. So there may be a case for compulsory contributions by means of taxation.

The prisoners' dilemma shows the complexity of social decision making - what may be in everyone's own interest may not be in society's interests. However, the lessons of the prisoners' dilemma are not always appreciated. Sometimes it is argued that the prisoners' dilemma would be solved if agents could communicate before making their decision. However, mere communication will not solve the problem; each agent will still have an incentive to confess rather than not confess - agents have no reason to believe that a promise not to confess will be kept. Of course, it would be different if agents could enter into binding agreements not to confess. But prisoners' dilemmas often occur at the societal level, with millions of agents involved, when coming to a binding, voluntary agreement would be prohibitively expensive.

Another erroneous assertion sometimes made about the prisoners' dilemma is that such problems would be solved with altruism. Although the particular prisoners' dilemma illustrated above may be solved if agents were altruistic (e.g., if they cared solely about the well-being of the other prisoner), it is quite easy to construct altruists' dilemmas, where everyone's behaving altruistically makes everyone worse off (in terms of an appropriately defined welfare criterion) than if everyone behaved selfishly. However, one should certainly not draw the conclusion that it would not be desirable if everyone became more altruistic - I think it probably would be. Rather, the message is that the situation is complex, and that there may be circumstances in which more altruism may in fact make things worse.

My conclusion is that a welfarist approach to social issues is of some value, and that it is possible to reconcile our deeply held conviction that freedom is desirable with such an approach. Also, social issues and policy are not straightforward; there is a complex interaction between institutions and the motivations and actions of individuals, and policy makers need to take these interactions carefully into account.

John Fender

17th September 2000 **Theo Todman**

I posted the notice below on PDGlist in February this year, and received some response from a couple of list members - namely those reproduced below from Ernie Davidson and Bob Williams. However, the pieces people were asked to comment on were rather long and complex for an internet discussion group, and may do better when they appear in print. So here goes !

DOES SCIENCE TELL THE TRUTH ?

As PDGList is a bit quiet for once, I thought I'd post a couple of papers that came out of a Seminar that fellow list member Peter Mansell & I attended at King's College Cambridge (our Alma Mater) on Thursday evening (17th February 2000). The seminar was one of a series of "Provost's Seminars", so called because the current Provost on King's (Professor Patrick Bateson) was once invited to take part in a similar affair at Baliol, Oxford and thought they were such a good idea that he instituted them at King's.

The idea is to get together a large group of King's dons, research students, undergraduates & former members of the College (in about equal proportions) to debate some important issue. The format is for two dons to deliver papers pro and con the issue at hand (in our case "Does Science Tell the Truth ?"). Then, over dinner and for an hour thereafter, the seminar breaks into groups of about 10 people - there were 9 of these - to discuss a pre-set question (there were four different ones shared amongst the groups). Thereafter, the "findings" of each group are presented by a "rapporteur" (usually an undergraduate) in a plenary session and the speakers respond to questions either arising from the group sessions or generally. Finally, attendees may repair to the bar to continue discussions. The show started at 17:30 for coffee, dinner was a rather brief 45 minutes, and the formal session finished at 22:15. We carried on talking in the bar until gone 24:00. I have to say it was an immensely enjoyable and stimulating evening and the first of many I intend to attend.

The papers were presented by Professor Peter Lipton (Professor of the History & Philosophy of Science at Cambridge) and Dr. Martin Kusch (Lecturer in Philosophy at Cambridge & Director of Studies in Philosophy at King's), both of whom are Fellows of King's. Dr. Kusch's paper was delivered as a hand-out, which I have scanned in & appears verbatim below. Professor Lipton did not provide hand-outs, so the account below is due to me, I'm afraid, and cannot be relied upon for accuracy or completeness - I've tried not to "round it out" lest I put my own inadequate thoughts into Professor Lipton's mouth. I have to admit that I found Dr. Kusch's talk the more stimulating.

Questions included the one my group received "Wouldn't it be a miracle if a scientific theory that had made many successful predictions turned out to be fundamentally incorrect ?". A second was something like "All past scientific theories have proved

false, so doesn't this make it inappropriate to suggest that current theories are true" ? A third had to do with definitions and categories of "truth", and I've completely forgotten the fourth.

Lots of issues and questions were raised in the discussion, but I've not recorded them - they were, in any case, far less coherent than the lectures and you've enough to be going on with !

17th February 2000 **Professor Peter Lipton**

... as garbled by Theo Todman ...

DOES SCIENCE TELL THE TRUTH ?

The purpose of the Philosophy of Science is to understand science better, not to make better scientists. This has led to most practising scientists having little time for the philosophy of science !

Professor Lipton supported the cause of Scientific Realism, that while the scientific programme is falibilist, and there have been many incorrect theories, yet science converges over time closer & closer to the truth.

What then, is truth ? This is a hard question. Scientific theories portray or model the world. Saying a scientific theory is true implies that it is an accurate model of the world.

Those who believe that science seeks the truth, who adopt the "truth view", would point to such things as the success of scientific predictions & the success of technology in support of their claim. Most, but not all, practising scientists adopt the truth view.

As a counter-example, Professor Lipton made a quotation from Stephen Hawking (not recorded by me, unfortunately!), the upshot of which was that there is no sense in which his theories are true or false; they are just empirically adequate (or not).

Alternatives to realism

- Instrumentalism - a "computer view" – we construct calculation devices which tell the truth about what's observable.
- Semi-realism - we only believe certain aspects of theories to be true.
- Kantian view - scientific theories represent the world, but not a world independent of us. We partially constitute and construct the world we live in.

- Adaptive view - scientific theories act like biological organisms and adapt to the situations they find themselves in.

- Scepticism.

One of the difficulties is that we're trying to determine causes from effects and working out what's there with a limited sensory apparatus.

Problems arise in two groups - how can we speak of truth "out there", and what reasons can we have for believing our hypotheses to be true ?

The eighteenth century Scottish philosopher David Hume believed that we can have no reason for the extrapolations involved in induction. Given any set of points, there are always infinitely many curves that fit them. Why chose simplicity rather than complexity ?

Even if we knew all the data and had a theory compatible with all the data, there will be other theories that equally account for the data. This is the problem of the under-determination of theory by data.

Some scientists, indeed most of those with any interest in the philosophy of science, are Popperians. Popper's theory is very simple - falsification. [There followed a brief and unsympathetic overview of Popper's Conjectures & Refutations thesis]. According to Popper, we can know a theory to be false with just one counter-example. However, there are problems with this idea. Firstly, it is not always easy to show that a theory is false. Secondly, this approach doesn't lead much beyond scepticism. On this theory, we are left with no reason to believe that any theories are correct or make correct predictions.

A final negative point was that we witness the graveyard of false theories - a catalogue of non-existent entities and processes.

Positive points in support of scientific realism

- Predictions - if some of our incredibly successful theories turned out to be wrong, this would require some sort of "cosmic co-incidence".

- Our theories get things right in advance - they don't just explain the existing data but make novel predictions of a different kind to the data that gave rise to them.

- We're not just passive, and on the "effect" side of things : we intervene in nature. An example was given of moving a (computer) mouse and seeing the cursor move on the screen. We may not be sure of the mechanisms involved, but we're pretty sure we're causing the effect.

- We're not just talking about electrons and quarks, but about tables & chairs. If we're committed to common-sense beliefs like tables & chairs, science gives us even better reasons to believe in its constructs.

Peter Lipton

17th February 2000 **Dr. Martin Kusch**

WHY SCIENCE DOES NOT TELL THE TRUTH

[1] Thesis: Science does not tell us the truth about the world. This is because the notion of 'the truth' as something fixed and unchanging is based on a mistaken view of language.

[2] Two preliminary comments: [a] To give a negative answer to the question 'does science tell the truth?' is not to be antiscientific. [b] Counterintuitive ideas are not necessarily wrong.

[3] My negative answer to the title question is based on a theory about language and truth. Here I can only explain it in a simplified form. My central simplification is to model two different views of the relationship between language and the world on two simple game-scenarios. Call these games **Peka** and **Sepo.**

[4] Imagine the following game, called '**Peka**.' In order to play the game one needs a big room filled with various objects, two players (**A** and **B**) and a stamp (along with an ink pad). Player **A** leaves the room. While **A** is out, **B** takes the stamp, walks around the room and stamps various objects in the room. Some of the stamp-patterns will be openly visible, some will be on object surfaces that are blocked or covered. All of the stamp-patterns will be identical in shape and colour. After a fixed time, **A** comes back in. His task is to identify all 'pekas.' A 'peka' is an object that has a stamp-pattern.

[5] Now imagine a different game, called **'Sepo**.' It needs the same objects-filled room. But it involves three players **(A, B, C**). No stamp or ink pad are required. While **A** is out of the room, **B** and **C** agree amongst themselves to call three objects 'sepo.' They must choose three objects that they regard as similar. Call these objects, '**object 1**,' '**object 2**,' and '**object 3**' and their collection the '**sepo-array**.' Then **A** is allowed to return to the room. **A** is told which three objects are called 'sepo.' Subsequently, **A** must go around the room, suggest further 'sepos,' and justify his selection to the other players. That is to say, he must find further objects that in his opinion are arguably similar to one or more of the three objects originally picked by **B** and **C**. Whether **A**'s choice is correct or not depends on the judgements (i.e. votes) of **A, B,** and **C**. When **A**'s suggestion concerning a new sepo is accepted by majority rule **(A, B,** and **C** vote), the new object is entered as **object 4** into the sepo-array. At the same time, **object 1** is dropped from the array. The game then continues relative to

the new, changed sepo-array. After a given number of rounds, **B** (and later **C**) continues in **A**'s role, but no new array is chosen.

[6] Some general observations:

[6.1] Observations concerning '**Peka**.'
[a] Pekas are identified on the basis of the perception of a property. [b] For any given object in the room, it either is stamped or not. And it makes sense to talk about the set of all objects that fall under the concept 'peka.' 'Peka' has, as philosophers say, a 'fixed extension.'
[c] In identifying pekas, **A** is making judgements of identity.
[d] Since 'peka' has a fixed extension, it makes sense to speak of player **A** as making progress. He gets ever closer to identifying all of the pekas.

[6.2] Observations concerning '**Sepo**.'
[a] Sepos are determined on the basis of perception **and** negotiation. **A** could not correctly identify sepos on his own.
[b] It would be incorrect to say that for any given object in the room, it either is, or is not, a sepo. That is, it would be incorrect to say that for any given object in the room it either is, or is not, similar to the initially chosen three objects. And thus 'sepo' does not have a fixed extension. Why?
[b.1] At any given time, no more than three objects are definitely 'sepo.' And these three objects change with each newly identified sepo.
[b.2] No object is 'sepo' prior to the vote taken by **A, B,** and **C**. We cannot say 'many objects in the room are really sepo, the players just haven't found them yet.' The problem with this proposal is that is overlooks the essential openness of similarity judgements. I am not saying that anything can - under normal conditions - be judged to be similar to just anything else. It would take very unusual circumstances indeed for us to judge a bulldozer and a cat to be similar. But such extreme cases aside, we can always go in more than one way. And what that way is, usually depends on our current activities and their goals.
[c] The judgements of **A** in identifying sepos are judgements concerning similarity, not identity.
[d] Since there is no set properly called 'the set of all sepos,' we cannot meaningfully speak of player **A** as making progress towards identifying all of the sepos. Remember here that at any given time the sepo-array only has three members. In other words, the array drifts over time. But it does not drift towards finding the final set of all sepos.

[7] Let me now bring in 'truth.' That can be done in two ways.

[7.1] What makes statements '**object n** is a peka' or '**object n** is a sepo' true?
[a] '**Object n** is a peka' is true if and only if **n** bears the mark of the stamp. This truth is recognition-independent; it holds whether or not we or **A** recognise it. The truth is determined and fixed. There is a specific number of statements of the form '**object n** is a peka' that are true. And that number of statements does not change. It makes sense to say that a successful **A** discovers more and more truths.

[b] '**Object n** is a sepo' is true if and only if **n** is judged (by the community) to be similar to the three current array elements. The communal similarity judgement is sensitive to empirical properties, but the truth of '**object n** is a sepo' is not recognition-independent; it only holds if the players recognise it. Truth is determined and fixed only **at a time**; but one and the same object can be judged to be a sepo at one time, and later, when the array has changed, not to be a sepo. There is no fixed number of statements with the form '**object n** is a sepo' that is true over time. A successful **A** cannot be said to discover more and more truths. And talk of getting ever closer to the truth does not make sense.

[7.2] What happens to truth if 'peka' or 'sepo' turned out to be fancy stand-ins for the word 'true?' To make sense of this scenario, we have to slightly change our games. Imagine that the two games were not played with respect to normal physical objects but with respect to sentences. Imagine these written on pieces of paper and distributed over the room. In game **Peka**, **B** stamps some of the pieces of paper; in game **Sepo**, **B** and **C** select three sentences as 'sepo.'
[a] In **Peka** it makes sense to say that truth is recognition-independent; that 'true' has a fixed extension; and that a successful **A** gets closer to identifying **the** truth. A successful **A** '**tells the truth**.'
[b] In **Sepo** truth is not recognition independent; 'true' does not have a fixed extension, only a statement that is similar to the array-statements is true; and a successful **A** does not get closer to identifying **the** truth. A successful **A does not 'tell the truth.'** There simply is no truth there waiting to be told !

[8] In order to bring the games in contact with life as we know it, we need to make changes in their rules. Here are the most important ones.
[a] In **both** games, allow for many classificatory words rather than just one.
[b] In **both** games, allow that the choice of classificatory terms is arbitrary. instead of 'peka' or 'sepo' we could have had any other sound or sequence of letters.
[c] In **Peka:**
[c.1] Replace the player who stamps with God, nature, or evolution. They sort things into kinds.
[c.2] And replace **A** with groups of individuals or scientists.
[d] In **Sepo**:
[d.1] I Drop the stipulation according to which the array can never have more than three elements.
[d.2] Allow that the elements of the array are 'exemplary cases,' 'paradigms,' or 'prototypes', rather than just any classified elements.
[d.3] Change the rules for dropping elements out of the array: which elements are dropped is itself something that must be negotiated amongst the players.
[d.4] Recognise that the exemplars in the array for 'true' are very diverse: we speak of truth in art, truth in painting, true friends, true gold, and true statements in ethics, physics, politics, history, and mathematics. And the same goes for alleged synonyms for 'true' like 'correspondence,' or 'accurate representation.' – What this observation provides is a supplementary way for arguing that there is no truth to be told.

[9] As you will already have suspected, I think that **Sepo** provides the correct model for thinking about empirical statements, classifications, theories and truth. It is right

because it fits with what we know about language learning, with experimental-psychological data concerning similarity judgements, with social-psychological data relating to certainty of decision, with the findings of the history of science, and with how we use language and relate to our environments.

[10] If the Sepo-theory of language and classification I have sketched here is right then: [a] The idea of a sum or set of all truths is incoherent.
[b] Truth cannot simply be defined as 'correspondence with the facts.' Coherence, consensus and considerations of expediency are also essential to truth.
[c] Truths are the local and passing products of negotiations amongst people who are directed both at their non-social surroundings and at their peers.
[d] There is no truth out there waiting to be told.
[e] It does not follow that we should stop using the words 'true' or 'truth.' What follows is that we should stop using them for purposes for which they are ill-equipped - defending science, for example.

Martin Kusch

Response from Ernie Davidson : Does Science tell the truth? Yes n' No. I may be coming here at a tangent but, I hope the readers get my point. When science gathers a body of knowledge the results are true according to the data and research results at hand. Then later a new piece of data is discovered which when added to the equation throws out the answer.

Let us take Cancer Research. It is virtually drug orientated. Apart from Chemotherapy, which in killing the cancer and sometimes the patient. This means that funding and publicity does not go to other forms of research and treatment. The researchers are dedicated and throughout life, school and their studies and from other professors are moulded into the drug-based research mode. I believe that even in our own democracy we can call this brainwashing.

Some years ago, I read an interesting 2-volume book written by a doctor and a journalist. It stated a conflict of interest in medical research between the companies who spend money researching and the interest in the patient getting better. It gave some specific details of the political and financial interests in an immediate cure not being found. However, from memory it did states that those involved in research were dedicated to finding solutions. Even if those scientists did come across the cancer research, many would naturally have fixed opinions and probably even refuse to accept the research had any credibility.

In the book, it stated that key drug companies financed Cancer research, since they were developing treatments. However their research excluded and even suppressed other forms of research that had a track record of research. The research claims that adding vitamin B17 to the diet could prevent and treat Cancer. This has dropped out of a great deal of our modern diets.

Here's the web-site : http://www.worldwithoutcancer.net/englishintro.htm

Let's take medicine in general: here are some interesting case histories.

Migraine : The patient had chronic headaches that must have been Migraine. These would last for several days. The Chinese doctor examined him for a few seconds and told him to lower his air-conditioner and gave him some herbs for 3 days. The migraine never returned.

High Blood Pressure : I saw a person's blood pressure back to normal where it still remained years later, in just three weeks of Chinese Medical treatment. Apparently, it contained a few animals. The Chinese Doctor will usually measure both arms as the blood pressure differs in these.

Yuppie 'Flu : There are several causes but the symptoms can be treated very simply using Traditional Chinese Medicine, with very little change to the routine, but the doctor may advise a reduction of alcohol.

We are taught that our own doctors know best, even when they can give a qualified don't know in how to treat the patient. Of course there are treatments that we wouldn't like too much, such as :-

Dog penis : for kidney complaints, and part of potency treatment (they use other types). I'm told this is rather salty.
Snake : for potency and treatment of rheumatism (with excellent results). This tastes like chicken. One Chinese chef says that therefore next time you eat chicken, remember it tastes like snake.
Lizard : for asthma
Sheep placenta : for beautifying a woman's skin. (I've seen it work).
Donkey vagina : For treating women who are ill after having a baby. Chinese doctors often call it butterfly due to its shape.
Donkey skin juice : For anaemia I spoke to someone who told me it worked for her.
Teas : Different teas for different seasons. Many old people swear by winter teas in that they are warm enough to wear less clothes in the harsh winters.

Because of our culture and backgrounds, our medical research would not look into these items as a first point of research. I may seem to be going off the point, but this is to illustrate how we sometimes treat information when analysing facts.

Here's a hypothetical case. A photograph of a politician talking to a known prostitute is printed in the press. Basically it is nothing but a photograph of a politician who appears to be talking to a known prostitute. Many readers will then start to imagine what he was doing, although the only information they have is the photo. The newspaper will probably carefully comment on the photo to mislead the readers. 'Politician caught on camera with prostitute". However, the politician was out with his wife who is not in the picture as she was in one of the shops, and the prostitute

recognised him and went to complain about the fact she had been on a council waiting list for 2 years……

Err.. that's what the politician said. The photographer by chance spotted the conversation, clicked the camera and then ran. He was true in that he saw a politician talking to a known prostitute.

Any comments ?

Ernie Davidson

Bob Williams : The first thing that struck me about both papers was that there was that there was not a clear attempt to define the very topic. If we ask "does science tell the truth," we have an obligation to make it clear as to what this is supposed to mean. Does it mean that all sciences must be 100% correct in the predictions made by all practising scientists in each discipline? I don't think many of us would buy into that. Does it mean that "science" is correct more than half of the time? 90% of the time? 99.92% of the time? These guys didn't seem to want to say, but were more interested in abstractions and contortions.

They did not make it at all clear what the term "science" means? Physics? Psychology? Archeology? Geography? Geology? Astronomy? Medicine? There are big differences as to how quantitative these are and about how they must deal with their subject matter.

Truth is the subject that philosophers love to discuss, but always in the abstract and, in my observation, usually to no useful end point. If a physicist says F = ma, is he making a statement of truth? If he puts values into the equation, is the statement more or less true? I accept that we know what this equation says and how to use it and how to understand and deal with any associated errors.

If an astronomer says the age of the universe is 12 billion years and another says 14 billion, they are doing so from the perspective of evidence that they believe is "best." We know that both are guessing, but doing so on the basis of available information and knowledge. Does this bother a philosopher? Does he say that they are not being "true?"

Much of science is based on statistics and can only be understood in terms of statistics. Within these areas, there are large exceptions to the general trends. If we look at growth rates, or disease resistance, or nerve conduction velocities, we can make very useful statistical observations, but there are data all over the place and each datum may be completely correct. So, in this context, what is "truth?"

" ... there is no sense in which his theories are true or false; they are just empirically adequate (or not)." : This simply defines away the arguments of absolute truth, which are probably meaningless in real world applications.

" ... the under-determination of theory by data." : It is not clear to me what is being argued. Is "truth" taken to mean only the accurate and infallible statement of scientific principles in the form of theories? For example, is it a scientific truth when a researcher identifies a specific virus as the cause of a disease? When a scientist measures the wavelength of light from a laser source? When DNA is examined and linked to another DNA source? When moon rocks are chemically analyzed and reported?

Look at these per the "alternate theory" concept. Do we have alternate theories about the causes of colds and AIDS? I thought there was pretty good agreement as to which viruses caused the diseases. Do we have alternate theories about laser light wavelengths? Does one scientist say that the light is red and the other says it is blue? Do we have people arguing that DNA links are coincidental, or have no meaning, or are falsely observed, or in some other way dispute them? Do we have people telling us that the moon rocks that have been studied are really cheese, as was long expected?

It seems to me that Martin Kusch wants to discuss language and not science. But, if he wants to discuss language, why doesn't he just proceed to define his terms clearly?

I started reading the "game" story and could not force myself to read completely through it. This kind of discussion strikes me as contrived for no useful purpose, by a guy who does not address the basic issues of what he means by science and truth.

If one removes the abstractions and looks at the history of scientific thought in various disciplines, he must conclude that there has been an evolution of increasing understanding of the subjects and that the theories used by scientists have evolved to more useful and defendable forms. It is the nature of science that we look at some matters that are so difficult to study that we may never have strong proofs of what we are inclined to believe, but we seem to continually build stronger cases for our understandings of how all of science relates (one part to another). Meanwhile, the ultimate test of how well we have done is to see if we have been able to use our knowledge productively to build machines, fight disease, improve health, and to control our environments. Whatever we accept as truth has worked well enough to allow us to build complex machines, to communicate over great distances, and to do the thousands of other things that were not possible before we reached our present level of scientific understanding of nature.

Bob Williams