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EDITORIAL NOTES

This Newsletter is prepared by the Theosophy-Science Group in Australia for interested members of the Theosophical Society in Australia. The email version is also made available on request to members of the Theosophical Society in New Zealand and USA with the cooperation of the respective national bodies. Members in USA wishing to subscribe should contact theosci-news@theosophical.org. Members in New Zealand should contact: john@theosophy.org.nz. Recipients are welcome to share the Newsletter with friends but it must not be reproduced in any medium including on a website. However, permission is given for quoting of extracts or individual articles with due acknowledgment. Selected items appear from time to time on the website of the TS in Australia – austheos.org.au.

The Springbrook Seminar:

Plans are advancing for the seminar at Springbrook in May. A programme will soon be sent to all participants. We have an almost full house. Summaries of the main talks will be included in future Newsletters. The last seminar in May 2003 was a great success and all were inspired by the talks, the atmosphere of Springbrook, and the bonding of the Group. All participants can contribute to making this one a similar success. Main sessions will be 75 minutes comprising 45 minutes talk with adequate time left for discussion. The evening sessions will be for lighter presentations or for general discussion on an appropriate theme such as “What can the Group contribute to the Theosophical Society?” and “How can theosophy contribute to a synthesis of religion, theosophy and science?” Time will also be made available for enjoying the idyllic surroundings. The Springbrook centre is a sanctuary and alcohol, smoking, non-medical drugs and meat products are not permitted. We are asked to observe this policy and have been comfortable with it in the past.

THE OM OF PHYSICS

A short essay by the Dalai Lama, from his new book, *The Universe in a Single Atom* (Morgan Road Books, 2005), is included in *New Scientist*, 14 January 2006. The introduction to the essay under the title *The Om of Physics* asks: “Can the knowledge of the world that Buddhists have gained through meditation compare with what scientists have learned through deduction and experiment? The **Dalai Lama**, who for years has had a keen interest in science and befriended many researchers thinks it can, especially where quantum physics is concerned”. Some extracts from the essay are given below.

The Dalai Lama begins with the statement: “One of the most important philosophical insights of Buddhism comes from what is known as the theory of emptiness”. This is seemingly strange and unfamiliar terminology to a Western mind, but the following discussion explains the implication of this concept. “The theory of emptiness was first propounded by Nagarjuna (circa 2nd century AD). ... Historians credit him with the emergence of the Middle Way school of Mahayana Buddhism in India, which remains the predominant school among Tibetans to this day”.

“At the heart [of the theory] is the deep recognition that there is a fundamental disparity between the way we perceive the world, including our own existence in it, and the way things actually are. In our day-to-day experience, we tend to relate to the world and to ourselves as if these entities possess self-enclosed, definable, discrete and enduring reality. ... The theory of emptiness reveals that this is not only a fundamental error but also the basis for attachment, clinging to the development of our various prejudices”.

“According to the theory of emptiness, any belief in an objective reality grounded in the assumption of intrinsic, independent existence is untenable. All things and events, whether material, mental or even abstract concepts like time are devoid of objective, independent existence. ... Things and events are ‘empty’ in that they do not possess any immutable essence, intrinsic reality or absolute ‘being’ that affords them independence”.

What of Science?

“One of the most extraordinary and exciting things about modern physics is the way the microscopic world of quantum mechanics challenges our common-sense understanding. The facts that light can be seen as either a particle or a wave and that the uncertainty principle tells us we can never know at the same time what an electron does, and where it is, and the quantum notion of superposition all suggest an entirely different way of understanding the world from that of classical physics, in which objects behave in a deterministic and predictable manner”.

“... To a Mahayana Buddhist, exposed to Nagarjuna’s thought, there is an unmistakable resonance between the notion of emptiness and the new physics. ... If on the quantum level, matter is revealed to be less solid and definable than it appears, it seems to me [says the Dalai Lama] that science is coming closer to the Buddhist contemplative insights of emptiness and interdependence. At a conference in New Delhi, I once heard [he says] Raja Ramanan, the physicist known to his colleagues as the Indian Sakharov, drawing parallels between Nagarjuna’s philosophy of emptiness and quantum mechanics”.

“When one puts the world under a serious lens of investigation – be it the scientific method and experiment or the Buddhist logic of emptiness or the contemplative method of meditative analysis – one finds things are more subtle than, and in some cases even contradict, the assumptions of our ordinary common-sense view of the world. ... What is wrong with believing in the independent, intrinsic existence of things? For Nagarjuna, this belief has serious negative consequences. ... It is the belief in intrinsic existence that sustains the basis for a self-perpetuating dysfunction in our engagement with the world and with our fellow human beings. ... Grasping at the independent existence of things leads to affliction, which in turn gives rise to a chain of destructive actions. ... For Nagarjuna, the theory of emptiness is not a matter of the mere conceptual understanding of reality. It has profound psychological and ethical implications”.

The Dalai Lama continues: “I once asked my physicist friend David Bohm this question: from the perspective of modern science, apart from the question of misrepresentation, what is wrong with the belief in the independent existence of things? His response was telling. He said that if we examine the various ideologies that tend to divide humanity, such as the racism, extreme nationalism and the Marxist class struggle, one of the key factors of their origin is the tendency to perceive things as inherently divided and disconnected. From this misconception springs belief that each of these divisions is essentially independent and self-existent. Bohm’s response, grounded in his work in

quantum physics, echoes the ethical concern about harbouring such beliefs that had worried Nagarjuna who wrote nearly 2000 years before”. He concludes: “I wish there were more scientists with his understanding of the interconnectedness of science, its conceptual frameworks, and humanity”.

The Dalai Lama Addresses a Conference of Neuroscientists in America

On November 12, 2005 the Dalai Lama spoke on “The Neuroscience of Meditation” at a meeting of the Society for Neuroscience in Washington DC in the first of a new lecture series: “Dialogues Between Neuroscience and Society”. This was reported in the *News Scan* segment of *Scientific American*, February 2006 under the title: “**Talking Up Enlightenment – Neuroscientists Hear – And Applaud – the Dalai Lama**”. Despite an advance petition by hundreds of scientists against the talk, an estimated 14,000 people attended, mostly watching large screens in overflow rooms.

The Dalai Lama stated that in cases of conflict between classical Buddhist teachings and science, he generally favours science. Suggesting a healthy dose of skepticism toward religious pronouncements on scientific matters, he nevertheless believed that people need not thereby lose religious faith – a commendably open-minded approach. He also suggested, however, that religion can help science and emphasised the beneficial effect on the brain of Buddhist style meditation. “The neuroscientists in the audience responded with approval, especially those who have examined the effects of meditation”. Sara Lazar of Harvard Medical School reported that brain scans show that meditation slows the rate of cortical thinning which occurs with age.

The Dalai Lama’s Book; “The Universe in a Single Atom”

The book (Morgan Road Books, 2005) is widely available in bookshops and is well worth reading. The sub-title is “**The Convergence of Science and Spirituality.**” I have not read it fully but have read enough to be deeply impressed with his erudition, especially his thorough knowledge of and training in Buddhism, but equally I am impressed with his vibrant interest in science, his rapport with scientists, especially David Bohm, and most importantly his lack of dogmatism and willingness to concede to science on non-essential areas of disagreement with his Buddhist teaching. This enlightened attitude should be recommended to religious people generally and of course to theosophists with regard to theosophical teachings. I will probably return to the book in the next issue. In the meantime, here are a couple of recommendations from the back cover:

Karen Armstrong, author of “A History of God” says: “With disarming honesty, humility and respect, His Holiness the Dalai Lama has explored the relationship between religion and science and suggested the way in which they can affirm and qualify each other’s insights. By juxtaposing traditional Buddhist teaching with the discoveries of modern physics and biology, he infuses the debate about such contentious issues as the origins of the universe, the nature of human consciousness, the evolution of species and genetic engineering with intimations of profound spirituality. His gentle but insistent call for compassion is desperately needed in our torn and conflicted world”.

Garry Wills, author of “Why I am a Catholic” says: “The Dalai Lama lost spiritual leadership in his own country but now exercises it around the world. Like all good teachers, he comes to learn. He found that what Buddhists lacked in his own country was a fruitful interchange with reason and modern science. Here he fosters that exchange, at a time when some Christians have turned their back on science and the Enlightenment. We are losing what he has gained”.

OCCULT CHEMISTRY AND ISOTOPES

In September 2003, the Journal *Physics World*, a monthly news Journal of the Institute of Physics (UK) included an article (p 23) by historian of science, Jeff Hughes, entitled: *Occultism and the Atom: the curious story of isotopes*. This article was sent to me at the time by Dr David Eagles, a retired theoretical physicist now living in England but formerly employed at the CSIRO in Sydney, where he was a member of the Theosophy-Science Group. He still keeps in touch and receives our Newsletter.

The existence of isotopes of the chemical elements (i.e. forms of an element with the same atomic number but different mass) was first discovered by chemist Francis Aston when he found a new form of Neon (with a different atomic weight) which he named meta-neon and reported his discovery to the annual meeting of the British Association (BA) in 1913. In a footnote to his paper, he explained that his name meta-neon for the new form of Neon he discovered was based on a 1908 paper by Besant and Leadbeater: *Occult Chemistry: A Series of Clairvoyant Observations on the Chemical Elements*. He goes on: “By theosophic methods entirely unintelligible to the mere student of physics, [the authors] claimed to have determined the atomic weights of all the elements known, and several unknown at the time. Among the latter occurs one to which they ascribe an atomic weight 22.33 (H=1) and which they call ‘Meta Neon’. As this name seems to suit as well as any other, what little we know of the properties of the new gas, I have used it in this paper”.

At the time, little was known of the nuclear structure of atoms. Radio-chemist Soddy had developed a then controversial theory of “isotopes” and seized on Aston’s discovery for support. Neils Bohr provided further support. The Nobel prizes for Chemistry in 1921 and 1922 went respectively to Soddy and Aston.

Hughes says that the story of Aston, the meta-elements and theosophy first came to light when he was searching through Aston’s papers in the Cambridge University Library, in connection with a book he was writing on the history of nuclear physics between the wars. He came across a document which appeared to be a version of Aston’s 1913 paper to the BA and contained the footnote on meta-neon referring to Besant and Leadbeater. Curiously, he states that this document does not correspond with any of Aston’s published papers, which leaves a confusing doubt as to whether the footnote was actually included in his presentation to the BA. Whether or not, Hughes leaves no doubt concerning Aston’s interest at the time in Occult Chemistry. However, it is not surprising that Aston subsequently lost interest and may well have become somewhat embarrassed by his earlier interest.

Hughes Explores Occult Chemistry and Theosophy

Hughes’ discovery of Aston’s interest certainly encouraged him to look into the 1908 paper on Occult Chemistry and he includes in his article Leadbeater’s diagrams for Neon, Meta-Neon, Argon and Meta-Argon. Hughes was evidently also inspired to investigate theosophy, and he gives a very sympathetic account as follows of what theosophy **was** not what it **is**. Perhaps he is just anxious to present it as Aston would have known it.

“Theosophy — meaning ‘divine wisdom’ was [note the ‘was’ not ‘is’] a centuries old system of philosophical and religious belief concerning the nature and processes of the divine and their relationship with the phenomenal universe. In its modern form theosophy was a social and intellectual movement founded in the US in the 1870’s and popular in Britain and Europe from

the 1880's. One of a number of beliefs that came into prominence in this period as alternatives to organized religion and scientific rationalism, theosophy drew on ideas from Eastern philosophy, mysticism and ancient traditions dating back to Pythagoras. Its blend of esoteric wisdom and spiritual philosophy (including a belief in reincarnation) appealed to Victorian audiences disenchanted by the materialism of much of modern science and by a Christianity which they saw as having become compromised by science. In particular, theosophy's emphasis on esoteric wisdom gave it a strong appeal to intellectuals. They saw in it a way of exploring and expressing hidden realities in an increasingly materialistic world without moral or spiritual values."

Hughes continues: "It is well known, of course, that several notable British physicists of this period – including Lord Rayleigh, Oliver Lodge and Thomson – were members of the Society for Psychical Research and were interested in what we might now call paranormal phenomena. Although their positions varied from cautious belief to complete scepticism, they all hoped that physics might be able to shed light on phenomena outside the range of normal experience. Like Psychical Research, theosophy was both controversial and fashionable in the early years of the twentieth century. Besant and Leadbeater to whom Aston referred at the 1913 BA meeting were two of the leading British theosophists. ... [They] saw theosophy as a higher form of science – a means by which natural phenomena and insights unavailable to (or ignored by) the physical sciences could be revealed and tested, and through which deeper universal truths might be attained. In this sense, they saw theosophy and science as complementary".

Hughes refers to their first publication on "Occult Chemistry" in *Lucifer* in November 1895, giving further details of their claims and also to their later book under that title (1909), suggesting that "It thus seems highly likely that theosophy had a small, but significant, impact on physics, as well as in other areas such as art, music and philosophy".

However following the meta-neon episode, Occult Chemistry and atomic (and nuclear) science continued in their own way with virtually no correspondence and it is not surprising that, as Hughes reports: "In his Nobel lecture and in his 1922 book *Isotopes*, Aston reconstructed the history of his own work to make the link between neon-22 and isotopes seem straightforward. The language of 'meta-elements' was (correctly) attributed to Crookes, but dismissed as a false path on the now artificially straightened road to the nuclear interpretation of isotopes. All reference to occult chemistry was eliminated. This reconstructed history quickly became accepted as the conventional account. ... but it covered up the complexity of the intellectual work that had gone into the reinterpretation of meta-neon and how isotopes and the nuclear atom had been brought together". This is certainly a very generous interpretation by the historian Hughes of the theosophical contribution, such as it was. He casts it in the context of how often the early history of important discoveries is mangled or forgotten so that it disappears from the record.

An Early Theosophical Commentary on Isotopes in Relation to Occult Chemistry

In *The Theosophist* October 1956, the second of three articles by Hugh Murdoch on Occult Chemistry based on a study group in Blavatsky Lodge, Sydney was entitled "New Elements and Isotopes". There we stated (p 175): "It is quite clear that isotopes were discovered by clairvoyant investigation long before they were discovered scientifically in 1913." We did not mention Aston specifically. We noted that an isotope of chlorine had later been found by Leadbeater after it had been found scientifically. They named it meta-chlorine in keeping with their terminology of meta-neon (as well as meta-argon and proto-argon). We suggested it was a pity that, as the investigations continued, further searches for scientifically discovered isotopes were not conducted.

We also suggested that adyarium and occultum with weights two and three relative to hydrogen might well, following the scientific discovery of isotopes, have been identified with the hydrogen isotopes deuterium and tritium instead of separate elements unknown to science. Had they instead labeled them meta-hydrogen and proto-hydrogen, their work might well have received greater acclaim.

At the beginning of the investigations in 1895, Leadbeater was flying blind with only Crookes' now obsolete form of the periodic table of the elements and a table of atomic weights for guidance. (Crookes incidentally was a member of the Theosophical Society). Isotopes were unknown as pointed out above in Hughes' article, and indeed the true nature of isotopes was not known until after the discovery of the neutron in 1932. While the early work when Leadbeater did not know what to expect was somewhat impressive, the so-called discovery of 'missing elements' X, Y and Z in Crookes' now obsolete form of the periodic table is unfortunate, since there is no such gap in the modern periodic table. These were 'discovered' after Mr. Jinarajadasa drew diagrams of what he thought they should look like. A similar false 'discovery' was the non-existent element kalon and even an isotope meta-kalon. In her 1913 Adyar Pamphlet No. 39; *"Investigations into the Superphysical"*, Besant warns of the risk of observer bias, especially since the observing instrument is the mind of the observer. She also says of clairvoyant observation: "We are not dealing with theories but with records of observation or flights of fancy or a mixture of the two". Much has been written on Occult Chemistry by theosophists over the years. I was once very interested in but it has for now sat long in my (metaphorical) 'too hard basket'. Certainly the structures bear no relation to the physicists' description of atoms. I have basically limited this discussion to the subject of isotopes where it is possible to say something positive.

IS PLUTO A PLANET?

The recent discovery of a Kuiper belt object slightly larger than Pluto has set the cat among the pigeons. The new object UB313 has a diameter 2,400 km compared to Pluto at 2,300 km. The name is a temporary one and the International Astronomical Union (IAU) will eventually decide on a formal name. By way of comparison the diameter of the Moon is 3,500 km and that of Ganymede, the largest solar system satellite, is 5,200 km, all in round figures. The recent discovery has set the cat among the pigeons as to what should be the defining characteristic of a planet. The Kuiper belt is collection of distant objects orbiting the Sun in or close to the plane of the Solar System. Several have been discovered whose size is a significant fraction of Pluto's, but with the new object being larger than Pluto, the argument now rages as to how many planets we should recognize.

Should UB313 be regarded as the tenth planet or should Pluto be downgraded to a Kuiper belt object? This is, after all, only a matter of definition. Until recently it had been all so simple. Essentially, the definition has effectively been an object of sufficient but unspecified size orbiting the Sun. Satellites, however large, do not count. Comets and asteroids orbit the Sun but are too small to be considered planets. Should we have 10 planets by accepting UB313 based on size? This would logically lead to the inclusion of any future Kuiper belt objects larger than Pluto. Should we retain the status quo of 9 planets including Pluto based on tradition, and rejecting UB313 together with any future large Kuiper belt objects? To me the most logical course would be to exclude Pluto and make the formal definition to be: "any object orbiting the Sun in the plane of the Solar System, provided that object exceeds in size the largest planetary satellite, Ganymede, satellite of Jupiter". The chief discoverer, Mike Brown of Caltech, interviewed by Robyn Williams in the ABC Science Show on 4 March, says his choice would be to downgrade Pluto but that he recognizes the difficulty of that in view of its long

acceptance as a planet. He “is willing to let culture be the deciding factor.” He says that committees of the IAU are struggling with this issue in conjunction with recommending a permanent name to UB313. On discovery, Brown unofficially named the ‘planet’ Lila on his website in honour of his then new infant daughter. He recognizes that has no standing. That name would, however, be interesting in view of its significance in Indian mythology.

THE ANTHROPIC PRINCIPLE or IS LIFE INEVITABLE?

The anthropic principle has been much discussed by scientists and others since its enunciation some decades ago by Brandon Carter. It has also been discussed in this Newsletter, especially in N50, September 2002.

In the ABC Science Show on 18 February, Robyn Williams introduced ‘his friend and colleague Martin Redfern’ (from the BBC) to lead a discussion on ‘The Anthropic Universe’ by 14 scientists, theologians, atheists and others. Were, as it seemed, all these experts together in the same room? They could conceivably have been assembled at the recent annual meeting of the AAAS (The American Association for the Advancement of Science), which attracts scientists and others from all over the world. Alternately it may have been cleverly spliced together from a series of taped interviews. Certainly all of the participants spoke their part in the broadcast. I give here an abbreviated summary from the typed transcript.

Brandon Carter, cosmologist (Paris Observatory) and originator of the term and concept, anthropic principle, leads off with the statement: “the fact that we are here tells us something about the universe. ... It places restrictions on what the universe can look like”. Paul Davies, cosmologist and astrobiologist, (Macquarie University, Sydney) explains “the laws of physics are almost fine tuned to encourage energy and matter to develop along certain pathways of evolution leading to greater and greater complexity and ultimately to consciousness”. Cosmologist and Astronomer Royal, Martin Rees says that we are trying to answer Einstein’s question: ‘did God have any choice in the creation of the world?’ Martin Redfern exclaims: “anyone who has looked out into the vastness of the universe is filled with awe. We don’t need to be poets, prophets or physicists to share those feelings and speculate on the purpose of it all. ... Today, atheist reductionists try to reduce the cosmic story to a series of random accidents and religious fundamentalists try to show it as evidence of some sort of intelligent creator external to the universe.” He says that he “like many scientists and thinkers, he has never been happy with either of these extremes”.

Paul Davies says: ‘It’s as if the universe were built for the purpose of life’. (Theosophists will of course suggest throughout this whole discussion that that is indeed the case and will take considerable comfort that the issue is being seriously debated). Martin Redfern says an old-fashioned theologian would say the universe was created by God and humans are central to it, but that no longer satisfies the scientific mind which today dares to ask ‘why is our universe just right for life?’

There is then a discussion on different versions or shades of the anthropic principle. David Deutsch defines the **weak anthropic principle** as simply basing all our assumptions on the fact that we exist. Frank Tipler (coauthor with John Barrow of the massive tome, *The Anthropic Cosmological Principle*), defines the strong version as: the belief that ‘the Universe had to bring mankind into existence’. Physicist, John Wheeler enunciates the ‘participatory cosmological principle, as the belief that we are participators in bringing the universe into being.’ David Deutsch and Martin Redfern

mention the ‘final anthropic principle,’ enunciated by Barrow and Tipler, as that life will eventually learn all there is to know.

Paul Davies points out that there are about 20 parameters (numbers or constants) in particle physics which seem to be completely free and yet a great many of them have values which, if they differed only slightly, would mean that there could be no life in the universe. He also points out that there are other critical factors such as there being just three normal dimensions of space. (Planetary orbits would be unstable in four or more dimensions). The size and content of the universe are also critical. John Barrow, Cosmologist from Cambridge University, and prolific author of popular books on science, says that many philosophers from Bertrand Russell backwards have argued that the enormous size and emptiness of the universe indicate that it is neither sympathetic nor conducive to life. He goes on to point out that, on the other hand, we now know that the size and age of the universe are necessarily connected with its expansion and that the production of life requires the necessary elements which are formed in supernovae explosions when successive generations of stars evolve and come to the end of their life.

Redfern points out that the tuning seems remarkably fine. Both he and Barrow refer to the remarkable discovery of Hoyle concerning the formation of the elements which occurs in supernova explosions at the end of a star’s lifetime. The strength of the nuclear force is so tightly constrained that an infinitesimal change would mean carbon (and thence heavier elements) would not form and there would be no life. Then again if carbon were a little more stable, oxygen would not form, and again no life. Hoyle is quoted as saying that ‘any physicist who examined the evidence could not fail to draw the inference that the laws of nuclear physics have been deliberately designed with regard to the consequences they produce in stars’. As those consequences are essential for life, Hoyle was indeed making a striking anthropic statement. [His collaborator, William Fowler, won the Nobel Prize and Hoyle was inexplicably left out. Many physicists share my view that he should have been included. Perhaps he had been too outspoken. I believe his omission is a sad indictment of the Nobel Prize award process].

Martin Redfern introduces George Efstathiou, the director of the Institute of Astronomy at Cambridge. [This Institute was founded by Fred Hoyle and Martin Rees was also at one time, director.] Efstathiou speaks of what he calls macho physicists who believe that a ‘theory of everything’ will one day be found which will explain the value of all of the fundamental constants and there will be no need for an anthropic principle. He regards that view as almost theological and hence such a macho physicist is a very religious man. What does he mean by that? I assume he means that such a belief is akin to a belief in God which can, in principle, explain everything. [What would he say about those who believe implicitly every detail in the *Secret Doctrine*? Is that not also being ultra-religious?]

Is there a multiplicity of universes?

There is a long contorted discussion about the possibility of multiple universes with varying laws. David Deutsch, a professed atheist, says that belief in the universe being created with the intention of forming life would put a dead stop to science because it could explain everything and it is not falsifiable as required for a scientific theory. He favours the concept of multiple universes with differing laws or values of the critical constants, so that we in fact are fortunate to live in the appropriate one for life. There follows a long contorted discussion between many participants around this theme, which I will skip. I will rather quote in part the contribution by Keith Ward who is a theologian and who was until recently, Regius Professor of Divinity at Oxford. Ward says, inter alia:

“You’re just putting the problem back one stage further to say every possible universe exists. What makes a universe a possible universe? ... The usual philosophical answer to that is, if you can think of it coherently, it is possible, but why should human thought be what makes a universe possible? ... So I think the concept of a multiple universe is very unclear. Is it a splitting quantum universe? Is it every logical possible universe there could be? Is it some finite bounded set, which is bounded by some set of laws – the super theory of laws? We don’t know. It’s such an unclear concept that it doesn’t really help to resolve very much. It’s rather like God”.

David Deutsch does not take up that challenge but rather seeks to get the discussion back on track by saying: “It’s not that we fit to the universe, that’s not the amazing thing. Anything that was in the universe would fit to it, no matter how the universe were constructed. The thing which requires explanation is exactly the same thing as required explanation in the case of William Paley and Charles Darwin and the origin of life and the argument on design and all those things. It is the existence of knowledge, the existence of a self-similarity. The way I like to put this is, there are some physical objects in the universe, namely human brains, whose internal constitution, whose mathematical relationships and causal structure reflects that of the universe as a whole. It doesn’t just reflect the niche that we evolved in. The causal structure and mathematical relationships in human brains reflect the whole of the physical world and what’s more, if that wasn’t amazing enough, it reflects it with increasing accuracy over time.”

Martin Redfern interpolates: “To David Deutsch it seems remarkable that the laws of the universe can be understood by human brains at all”. Deutsch continues: “The extraordinary thing is not that there **are** laws but that we can understand them. Why should we be able to understand them? It’s almost as if, whenever we land on a new and unknown planet, the inhabitants come up and speak to us in English. Well either it’s a fantastic coincidence or there’s some deep reason why it **had** to be that way. And if it had to be that way, then we occupy a very special place in the universe indeed, and that’s the **strong anthropic principle**.” [not bad for an atheist].

Martin Redfern then calls on John Wheeler ‘who coined the next term – the participatory anthropic principle.’ Wheeler said that quantum physics leads to “a view that man, or intelligent life, or communicating observer participators are the whole means by which the very universe is created: without them, nothing”. Paul Davies cites the well-known double slit experiment in support. Frank Tipler says “The participatory anthropic principle says that the entire universe and everything inside it is brought into existence by innumerable acts of observation, by all the observers that have ever existed, exist now, or will ever exist”. David Deutsch disagrees with this extreme view but says there is something very attractive about it. Martin Rees expresses a contrary view, refusing to be drawn on this or on the question of purpose, saying: “I’m unsympathetic to people who claim flip and easy answers” to these things and says “I can share the mystery and wonder with religious people but I don’t think one should be anthropocentric enough to believe that human brains are attuned to the ultimate level of reality. Therefore I don’t think we should expect to be able to understand these questions”.

Keith Ward as a theist takes up the issue of quantum physics in relation to consciousness and Wheeler’s views discussed above, saying: “If you went – as John Wheeler I think sometimes does – to an extreme view, it would be consciousness actually creates the world. ... so you get a weaker and a stronger view. ... One is that consciousness changes the nature of what there is and the other [stronger view] is that consciousness creates the nature of what there is, ... but of course God’s consciousness creates the universe so God is the ultimate observer”. Presenter, Martin Redfern adds:

“Perhaps there is an ultimate observer, not so much an external creator but a mind within the universe, of which we are a part, a mind which not only creates but sustains”.

Martin Redfern continues: “Whether the observers are human, divine or small furry creatures from Alpha Centauri, if they are necessary for the manifestation of the universe into reality, then one more grade of anthropic principle is called for”. He calls on Frank Tipler who defines the “final anthropic principle” as; “Life must come into existence in the universe, and once it comes into existence, it will continue to exist until the end of time”.

A little further on Martin Redfern says; “It’s beginning to sound like God, as least in as far it is omniscient, is an emergent property of the universe. So can we tempt an atheist like David Deutsch into a theological discussion?” Deutsch responds in part: “In thinking about fine tuning and trying to explain it, what we’re looking for is something that explains the fine tuning. In other words, providence there is not a proposed solution. It’s an interesting problem, which is going to be explained by something else, if at all. Martin Redfern then asks: “if quantum theorists such as David Deutsch can allow theological terms to creep in, is there any movement the other way”?

Keith Ward responds: “Most theologians I know now are calling themselves panentheists (because they don’t like the word pantheist), and a panentheist is someone who thinks the world exists within God. There’s even a quotation in the Book of Acts; ‘All things live and move and have their being in God’ and that’s a view I find very attractive ... perhaps there are bits of God which aren’t in any universe ... The view I would like and is very widely held among Christian theologians now, is that God is greater than but includes the universe. Of course that’s been an Indian, Hindu belief for a very long time. In theology we’re all agreed you have to get rid of an anthropomorphic God, one who is like a human person but outside the universe. You certainly have to get rid of that but you can still talk about a cosmic mind or the intelligence of the universe, and in the Indian tradition that would be called Sat Chit Ananda, quite widely, Being Consciousness and Bliss. That’s exactly what I think is the sort of God that science would suggest. I think a combination of those two strands is the future of religion. ... **Indeed it seems to make sense if you’re looking at it in the most broad terms, to see the universe as a finite reflection of the intelligence of the ultimate mind, a reflection which becomes one with the source**”. [Emphasis mine. In other words: “Intelligence Came First”.]

I have attempted to summarise briefly what seem to be the main points of this fascinating discussion. For a complete version see: www.abc.net.au/rn/science/ss/stories/s1572643.htm

FROM STARS TO BRAINS

(A Conference in Honour of Paul Davies)

This conference over 2 days June 21-2 is being held at The Academy of Science in Canberra, in celebration of Davies’ 60th birthday, a practice which often occurs for very prominent scientists. The two main speakers are Davies himself and George Ellis (both Templeton Prize winners). Prominently featured in the promotional material is a quotation from Davies; “We are meant to be here”; in other words evolution to intelligent life, capable of exploring this rationale is an important inbuilt feature of the universe. This is a topic we have discussed many times both in this Newsletter and in deliberation at the last Springbrook seminar in 2003. Also prominently featured is Wheeler’s famous U symbol with a stylized representation of a head with an eye at the top of one arm of the U looking straight across to the other arm of the U, implying intelligence contemplating the nature of the universe, of

which it is a part. Included below is a slightly abbreviated summary of the Conference rationale. Full details may be obtained from: www.manningclark.org.au/events/stars/

Conference Rationale (abbreviated)

Inherent in human perception is an anthropic self-referential paradox: can the conscious mind explore its own *raison d'être*? Has *Homo sapiens* evolved a level of cerebral sophistication allowing it to resolve the deepest questions in the natural world? Is the Universe '*biofriendly*', as espoused by George Ellis' philosophy, or is it indifferent to life? ... In Stephen Hawking's words, '*Why does the universe go to all the bother of existing?*' Major scientific insights achieved into *how* the universe behaves leave open questions as to *why* it behaves the way it does. In a world consisting of a hierarchy of levels, where strands of upward (base-to-top) causality are explained, how can downward (top-to-base) causality be understood? Does consciousness pervade nature in degrees, as required by pantheistic philosophy, or is it restricted to the higher life forms? Does *Homo sapiens* represent nature's own intelligent eyes, as expressed in John Wheeler's U symbol, and how can the reality of Carl Sagan's perception, '*starstuff pondering the stars; organised assemblages of ten billion billion atoms considering the evolution of atoms*', be comprehended? Where do art and music arise? ...

Attempts at tackling such questions need to consider not only the probing capacity of the human brain but also its blind spots, including the denial of realities that contradict consciousness and threaten the survival of the species. Whereas the origins of life and of consciousness remain elusive, their emergence may be traced through exploration of links between natural systems of different scale and complexity. This multidisciplinary conference will examine links between astronomy, planetary science, physical principles and information theory relevant to the evolution of biogenic molecules, and the emergence of living systems –culminating in creative artistic and spiritual expressions of human consciousness.

Programme

The Conference programme covers a lot of ground in two days. The full programme is available on the website. On the first day June 20, the major theme is **Nature**. The leading speaker is Paul Davies on "The Search for life in the universe". There are 14 other talks. Samples are: "From interstellar space to planets: building the chemistry and conditions for Life". "Extraterrestrial asteroid and comet impact connections for planetary evolution". "Small brains, smart minds, perception, learning and 'cognition' in honey bees". "Complexity theory, the mind, self awareness and consciousness". On the following day the major theme is **Consciousness**. The lead speaker is George Ellis on "The emerging nature of the mind: intellect, emotions, values". There are 12 other talks, including: "Consciousness and theology: the creation of gods and myths in the human mind". "Religious faith versus freewill and biological determinism". "Is human-like intelligence a convergent feature of cosmic biological evolution?"

Note: This is a very formal conference over two days with talks by 26 speakers plus two panel discussions and a formal dinner which includes talks by the two main speakers. Our seminar at Springbrook is different in concept and will be more relaxed and informal with about 26 participants including about 12 speakers over three days with plenty of time for audience participation in discussion.

THE MIRACULOUS PROPERTIES OF WATER

Water is essential to life and the water molecule has long been known to have a very unusual structure which accounts for the fact that water shrinks as it freezes. Below 4⁰ it ceases contracting and begins to expand (with a resulting decrease in density), so that when a lake or an ocean freezes, the ice floats on top rather than freezing solid, allowing freedom of movement for living organisms below. However, an article in *New Scientist*, 8 April, 2006 reports recent discoveries of even more remarkable properties concerned with water's ability to sustain life. "It now seems that the effects of water on living organisms transcend mere chemistry: They are intimately linked to the most basic processes in the cosmos". We owe our existence to quantum effects in water. The hydrogen bonds in water are due to one of the strangest quantum phenomena known as "zero-point fluctuations" arising from Heisenberg's uncertainty principle. Felix Franks of the University of Cambridge points out that if you swap the hydrogen in water for its heavy isotope deuterium, you have a liquid chemically identical to water but poisonous to all but the most primitive living organisms. "The only difference is in the zero-point energy, a quantum effect".

Recent researchers who have investigated the consequences of this deep link between quantum effects and life have shown that water molecules play a crucial role in ensuring the correct shape of protein molecules determined by their DNA. "The results suggest that it is no accident that chains of amino acids trap water molecules as they fold up to form a protein. ... The water molecules report the DNA sequence to the protein while it is some distance away. Then as the protein gets close, the water molecules are ejected from the site until it binds tightly to the DNA". **Research such as this "challenges simplistic assumptions about how life works ... Certainly the simplistic assumption that life can be summed up in a catalogue of genes and the proteins they code for looks simplistic"**. [Emphasis mine].

A materials scientist at Pennsylvania State University, Rustum Roy, believes it is time for re-examination of claims that water has a "memory", which has long been cited as a possible mechanism for homeopathy. Some preparations are so dilute that they contain no molecule of the dissolved substance. Roy argues that water has proved itself capable of effects that go beyond simple chemistry and these may imbue water with a memory. One way this may occur, he says, is through an effect known as epitaxy: using the atomic structure of one compound as a template to induce the same structure in others. He gives an example: "The seeding of clouds is the growth of crystalline ice on a substrate of silver iodide which has the same crystal structure. No chemical transfer whatsoever occurs." Roy and his colleagues also draw attention to another effect which he believes mainstream scientists have overlooked in their rush to dismiss homeopathy. His team suggests that the vigorous shaking which homeopaths use can cause very high localized pressures in the water which may trigger fundamental changes in the water molecule.

Some of the above results will no doubt lead to controversy. However, the article concludes: "After decades of research, Franks sums up his view of the simple little molecule we call H₂O in terms that will put a smile on the face of New Age hippies everywhere. 'It's the magic ingredient that turns lifeless powders on laboratory shelves into living things.' "

Regards to you all,

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