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Scientific Truth and New Age Thinking

Proponents of the 'New Age Movement' adopt an epistemology that is opposed to that of science. Fritjof Capra's critique of the classical scientific method epitomises their attitude. However, some New Age writers claim that modern physics supports their view of reality and the nature of truth. Some examples of their argument are given. It is proposed that their criticisms of science are really criticisms of 'scientism', a metaphysical construct based on the assumption that the scientific method is the only way to truth. The New Age appeal to modern physics is assessed. It is argued that Christianity provides a metaphysical framework that is more compatible with science than the metaphysical framework of New Age thinking.

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Introduction

In a recent book which tries to put the current 'New Age Movement' into a broad historical context of movements which have claimed to herald the arrival of heaven on earth, Rachel Storm describes the New Age Movement as

... a vast umbrella movement embracing countless groups, gurus and individuals, bound together by a belief that the world is undergoing a transformation or shift in consciousness which will usher in a new mode of being, an earthly paradise . . . By dismissing logical argument, by putting intuition above intellect and feeling above theory, the New Age happily embraces wildly differing creeds. For the New Age is not 'either/or' but 'both/and', as its proponents so often insist.¹

For the average scientist the approach to truth implied here is, to say the least, worrying. Modern science seems to have progressed by making either/or distinctions: either the Sun and the planets revolve around the Earth, or the Earth and the planets revolve around the Sun; either substances burning in air lose phlogiston or they combine with oxygen; biological change is due either to the inheritance of acquired characteristics or to genetic mutation, etc. Moreover, logical argument has been taken to be central to the scientific method:

The scientific community sees itself as the very paradigm of institutionalized rationality. It is taken to be in possession of something, the scientific method, which generates a 'logic of justification'. That is, it

1 Storm, R. *In Search of Heaven on Earth*, London: Bloomsbury (1991), p. 191.

provides a technique for the objective appraisal of the merits of scientific theories. In addition it has even been claimed by some that the scientific method includes a 'logic of discovery', which is to say that it provides devices to assist the scientist in the discovery of new theories.²

Some recent historians, sociologists and philosophers of science, most notably perhaps Feyerabend³ and Kuhn⁴, have attacked this rational view of science. However, by and large both the philosophers and practitioners of science more or less accept it. Clearly intuition has its place in the practice of science, but it has to come under the discipline of the intellect. Personal feelings have to give way to the goal of dispassionate objectivity in the search for truth.

Given the apparent total opposition between the epistemologies of New Age and scientific thinking it is not surprising that many proponents of the New Age are highly critical of science. It would seem reasonable to conclude that if New Age thinking becomes dominant in our culture science has little future. In fact Gary Zukav⁵ declares that 'We are approaching the end of science'. This, he says, does not mean the end of the search for more comprehensive and useful physical theories. What it does mean is, as Prof. G. F. Chew⁶ puts it, 'a completely new form of human intellectual endeavour, one that will not only lie outside physics but will not even be describable as "scientific"'. This will be the result of entering into 'the higher dimensions of human experience'.

What may seem surprising is the fact that New Age writers appeal to modern science to vindicate their view of the nature of truth and reality. Marilyn Ferguson claims that 'the new science goes beyond cool, clinical observations to a realm of shimmering paradox, where our very reason seems endangered'.⁷ The paradoxes can be accepted because,

On some level – call it heart, right brain, gut, collective unconscious – we recognize the rightness, even the simplicity of the principles involved. They fit with deeply buried knowledge within us. Science is only confirming paradoxes and intuitions humankind has come across many times but stubbornly disregarded.⁸

Apparently the one place where these paradoxes and intuitions have not been disregarded is in the Eastern religious philosophies. Fritjof Capra, one of the scientific gurus of the New Age, claims that

... the basic elements of the Eastern world view are also those of the

2 Newton-Smith, W. H. *The Rationality of Science*, London: Routledge & Kegan Paul (1986), p. 1.

3 Feyerabend, P. K. *Against Method*, London: New Left Books (1975).

4 Kuhn, T. S. *The Structure of Scientific Revolutions*, 2nd. ed., Chicago: Chicago University Press (1970).

5 Zukav, G. *The Dancing Wu Li Masters*, London: Flamingo (1989), p. 331.

6 Chew, G. F. quoted in *op. cit.*, Zukav, p. 331.

7 Ferguson, M. *The Aquarian Conspiracy*, London: Paladin (1989), p. 160.

8 *ibid.*, p. 157.

world view emerging from modern physics . . . Eastern thought and, more generally, mystical thought provide a consistent and relevant background to the theories of contemporary science.⁹

What is to be made of all this? Faced with a potentially large and complex subject this paper will focus on three matters: the New Age criticism of the scientific method, the claim that modern physics supports New Age thinking, and a Christian response.

The New Age Criticism of the Scientific Method

Capra¹⁰ provides a clear and succinct exposition of the New Age criticism of the scientific method. He links the criticism with four of the founding fathers of modern science. We will follow his approach without entering into any debate about how accurately he represents the actual thinking of the people concerned and their role in the development of science.

Galileo postulated that scientists should restrict themselves to studying the essential properties of material bodies – shapes, numbers, and movement – which could be measured and quantified. These properties can be expressed in the language of mathematics. Other properties are subjective mental projections and should be excluded from the domain of science. Capra accepts that Galileo's strategy has been extremely successful. However, he criticizes it because it removes from the realm of scientific discourse aesthetics, ethical sensibility, feelings, motives, intentions, soul, consciousness, spirit; in other words, 'experience as such'.

Bacon is criticized for his strong, and successful, support of the view that the goal of science is knowledge that can be used to dominate and control nature. The ecological problems posed by science and technology flow from this 'Baconian spirit'.

Descartes comes in for three-fold criticism. First, he is taken to task for believing that there is such a thing as 'certain, evident knowledge'. Capra asserts that twentieth-century physics has shown 'very forcefully' that there is no absolute truth in science. Secondly, Capra criticises Descartes' analytic method of reasoning. He admits that this has 'proved extremely useful' in the development of science and technology but objects to its outcome – reductionism, i.e. the belief that all aspects of complex problems can be understood by reducing them to their constituent parts. Thirdly, Capra is critical of Descartes' sharp distinction between mind and matter, which paved the way for treating the material universe as nothing but a machine.

Newton is credited with combining the empirical, inductive approach of Bacon with Descartes' rational, deductive method to produce 'the methodology upon which natural science has been based ever since'. He

9 Capra, F. *The Tao of Physics*, London: Flamingo (1983), p. 30.

10 Capra, F. *The Turning Point*, London: Flamingo (1985), ch. 2.

promulgated the view that all physical phenomena are the result of the motion of material particles within absolute space and time. That motion is governed by fixed laws. The result was a view of nature as a giant cosmic machine, completely causal and determinate. This picture of a perfect world machine, says Capra,

. . . implied an external creator; a monarchical god who ruled the world from above by imposing his divine law on it. The physical phenomena themselves were not thought to be divine in any sense, and when science made it more and more difficult to believe in such a god, the divine disappeared completely from the scientific world view, leaving behind the spiritual vacuum that has become characteristic of the mainstream of our culture. The philosophical basis of this secularization of nature was the Cartesian division between spirit and matter. As a consequence of this division, the world was believed to be a mechanical system that could be described objectively, without ever mentioning the human observer, and such an objective description of nature became the ideal of all science.¹¹

In this critique we find a catalogue of those things which inspire antipathy in New Agers in general: reductionism; a mechanistic, deterministic view of the universe; the valuing of rationality above intuition/feeling; the divorce between mind/consciousness and matter; the idea of objective truth; a materialism which ignores the spiritual aspect of reality.

The Appeal to Modern Physics

Here we can present only a few salient examples of the New Agers' appeal to modern physics to support their views. The books cited should be consulted for the full picture. Modern physics is claimed to support the following postulates.

1 The material world we see is an illusion. Ultimate reality is an insubstantial flux of energy.

Support for this is found in what is probably one of the best known scientific equations;

$$E = mc^2$$

E stands for energy, m for mass and c is the speed of light. The equation states that mass and energy are inter-convertible. Experiments in high-energy particle physics have verified this equation. It is now a well established fact that not only can particles be converted into, or created from, energy but also one kind of particle can be converted into another with the absorption or emission of energy.

Both Zukav and Capra make much of this equivalence of matter and energy.

11 *ibid.*, p. 52f.

'In the East, however, there never has been much philosophical or religious (only in the West are these two separate) confusion about matter and energy. The world of matter is a relative world, and an illusory one: illusory not in the sense that it does not exist, but illusory in the sense that we do not see it as it really is. The way it really is cannot be communicated verbally, but in the attempt to talk around it, eastern literature speaks repeatedly of dancing energy and transient, impermanent forms. This is strikingly similar to the picture of physical reality emerging from high-energy particle physics'.¹²

'Like modern physicists, Buddhists see all objects as processes in a universal flux and deny the existence of any material substance'.¹³

Further support is found in the success of quantum field theory as a way of dealing with the interactions of sub-atomic particles. Zukav claims that

According to quantum field theory, fields alone are real. They are the substance of the universe and not 'matter'. Matter (particles) is simply the momentary manifestations of interacting fields which, intangible and insubstantial as they are, are the only real things in the universe.¹⁴

According to Capra quantum field theory provides

... the closest parallel to the Void of Eastern mysticism in modern physics. Like the Eastern void, the 'physical vacuum' – as it is called in field theory – is not a state of mere nothingness, but contains the potentiality for all forms of the particle world. These forms, in turn, are not independent physical entities but merely transient manifestations of the underlying Void.¹⁵

The claim that both relativity and quantum theory support the view that matter is an illusion is totally unconvincing. Einstein's equation says nothing more than that matter can be converted into energy and vice versa. Quantum field theory shows that both energy field and particle interpretations of sub-atomic reality are valid, depending on how that reality is 'interrogated'.¹⁶ To say that matter is unreal because it can be converted into energy is like saying that ice is unreal because it can be turned into water.

2 The universe has to be seen as a unified, inter-connected whole.

The key piece of evidence for this is a consequence of quantum theory which is often called 'the Bell effect', after one of the physicists who has studied it, although it was in fact Einstein and some of his co-workers, Podolsky and Rosen, who first pointed it out. Put very simply, the essence of the Bell effect is that once two sub-atomic particles have interacted with

12 *op. cit.*, Zukav, p. 177.

13 *op. cit.*, ref. 9, Capra, p. 226.

14 *op. cit.*, Zukav, p. 219.

15 *op. cit.*, ref. 9, Capra, p. 247.

16 Polkinghorne, J. *One World*, London: SPCK (1986), pp. 84, 108.

one another they are ever afterwards part of a single quantum system. This means that if, for example, the momentum of one of them is changed, the momentum of the other will change also, and do so instantaneously. This will happen even if they are at opposite ends of the galaxy. The shocking thing about this is that all 'normal' physical effects are brought about by the transfer of energy or information in some form and, according to the theory of relativity, this cannot happen at a speed faster than that of light. Hence for something happening in one place to have an instantaneous effect somewhere else means that something other than normal cause and effect is operating. What Bell did was carry out the mathematical analysis which provided the basis for an experimental test of whether or not this instantaneous 'action at a distance' does take place between sub-atomic particles. The answer is that it does though we cannot (yet) describe or define just what it is.

Zukav¹⁷ concludes that the Bell effect shows that,

'what happens here is intimately and immediately connected to what happens elsewhere in the universe, which in turn, is intimately and immediately connected to what happens elsewhere in the universe, and so on, simply because the "separate parts" of the universe are not separate parts'.

In other words, the universe is one single, interconnected wholeness and the 'separate parts' into which we divide it are unreal – as the eastern mystics have told us all along.

There is a fundamental confusion in the way that Capra *et. al.* appeal to the Bell effect. In fact the Bell effect can be interpreted in two ways. The most popular interpretation is that there is instantaneous 'action at a distance' within a quantum system. The alternative interpretation is that there is no underlying physical reality corresponding to such abstract concepts as 'electron', 'position' or 'momentum'. The problem for Capra is that he wants to have it both ways. He denies the reality of electrons and their properties, but then appeals to the Bell effect to prove the inter-relatedness of all things. To be consistent he can only appeal to it to support one or other of these points, not both.

An argument by analogy which is often appealed to in tandem with the Bell effect is that of the hologram. A hologram is produced by two beams of laser light, one striking a photographic film directly, the other being bounced off a three-dimensional object. When the developed film is illuminated by the same type of laser light, an image of the original object in three dimensions is produced. Moreover, only a part of the film needs to be illuminated, showing that this small part contains the information of the whole. This, it is argued, supports the mystical view that the totality of

17 *op. cit.*, Zukav, p. 315.

reality is 'in' each part and that everything is intimately interconnected. As Marilyn Ferguson¹⁸ puts it,

'... psychic phenomena are only by-products of the simultaneous-everywhere matrix. Individual brains are bits of a greater hologram. They have access under certain circumstances to all the information in the total cybernetic system . . . The brain is a hologram, interpreting a holographic universe'.

Talbot¹⁹ has developed the idea of a holographic universe at length.

The holographic paradigm is sometimes appealed to as if it provided proof of the inter-connectedness of all things. However, at best it can provide no more than a model of how we might think about this, and especially about the mystics' experience of oneness with the universe. There are a number of weaknesses in this model.

- 1 As a hologram is cut into smaller and smaller fragments there is a loss of clarity of the image. Eventually no image can be produced at all. According to the mystics the whole of reality is fully 'encoded' in each fragment, however small.
- 2 What corresponds to reality in the analogy is not really the photographic plate but the plate plus the necessary apparatus to reproduce the image, which has no parallel in the mystical view.
- 3 The hologram does not contain information about itself but about a separate objective reality. For a strict analogy to hold, the reality experienced by the mystic as 'in' each fragment of reality would have to be the copy of another real universe.

3 Human consciousness plays a part in creating reality.

Werner Heisenberg showed that the quantization of energy puts limits on what we can know about atoms and sub-atomic particles. For example, we cannot know at one and the same time both the exact position of a particle and its exact momentum (a measure of its velocity). The more accurately we know one, the less accurate is our knowledge of the other. This is Heisenberg's 'Uncertainty Principle'. As a result we can talk about such things as the position or velocity of such particles only in terms of probabilities.

Another well-known aspect of quantum theory is what is known as wave/particle duality. In some experimental situations an electron, for instance, behaves like a particle. In others it behaves like an energy wave. What determines whether an electron behaves like a wave or a particle? One answer is that the experimental set-up we use to observe it determines this. In other words, how we look at it determines what we see. A similar question applies to its position, given the Uncertainty Principle. If there are

¹⁸ *op. cit.*, Ferguson, p. 182.

¹⁹ Talbot, M. *The Holographic Universe*, London: Grafton (1991).

finite probabilities of it being in several different positions, what determines the fact that we see it at one particular position? Again, some suggest that the very act of observing it 'fixes' it at that position. It is argued from this that since it is humans who decide what to observe and how to observe it, human consciousness plays a part in determining how the world is. As Capra puts it²⁰, 'The electron does not have properties independent of my mind'. Humans are participators in the creation of reality. This leads Michael Talbot to claim²¹,

'For centuries the mystic has asserted that matter and consciousness are different aspects of the same something. For all those who have spent their lives trying to penetrate the secrets of matter, the new physics has a message, not a new one, but one that may well turn out to be the most important rediscovery humankind has ever made . . . the message of the new physics is that we are participators in a universe of increasing wonder'.

The claim that our consciousness affects the nature of reality is only one (and not the most widely held) of several possible interpretations of the implications of quantum theory.²² In particular, it can be argued that this view confuses the act of observation with the consciousness of the observer and that it is the influence of the measuring apparatus, not the mind of the observer, that affects the result obtained. For example, is it really credible that a photographic plate exposed and then put away uninspected does not have a definite image on it until someone looks at it? Even if one does opt for the possibility that the consciousness of the observer is affecting the result of the measurement, I think it is arguable that this does not mean that the observer determines what is reality. An alternative would be to say that there is an unchanging objective reality and the observer selects just one aspect of it for examination.

4 To understand reality we have to abandon classical logic, replacing its either/or by both/and. As a result it can be known only by experience.

Logic is the discipline which attempts to distinguish bad reasoning from good reasoning.²³ It attempts to formulate rules which can tell us whether the reasons that have been given for a particular conclusion are good ones or not. These rules form a logical system. The essential requirement of any logical system is that it should be self-consistent. The rules or 'laws' of a logical system are so framed that, if they are applied properly, it will not be possible to use them to prove statements which are mutually contradictory

20 *op. cit.*, ref. 10, Capra, p. 77.

21 Talbot, M. *Mysticism and the New Physics*, London: Routledge & Kegan Paul (1981), p. 42.

22 Clifton, R. K. & Regehr, M. G. 'Capra on Eastern Mysticism and Modern Physics', *Science & Christian Belief*, 1 (1989), 57–63. Polkinghorne, J. *The Quantum World*, Harmondsworth: Pelican Books (1986), pp. 63–69.

23 For a brief discussion of the definition and nature of logic see: Popkin, R. H. & Stroll, A. *Philosophy Made Simple*, London: W. H. Allen (1977), 224–228.

within the framework of the system. The logic which we use in everyday discussions and debate, so called 'classical logic', makes use of rules which have been discussed and formulated since at least the time of Aristotle.

In 1936 von Neumann and Birkhoff²⁴ laid the foundations for 'quantum logic'. The most important difference between the rules of classical logic and quantum logic involves the law of distributivity. This says that 'A, and B or C' means the same as 'A and B, or A and C'. For example, 'I toss a coin and it comes up heads or tails' means the same as 'I toss a coin and it comes up heads, or I toss a coin and it comes up tails'. The law of distributivity is a foundation of classical logic, but it does not apply to quantum logic. This is why quantum mechanics can produce the wave/particle duality.

David Finkelstein appeals to quantum logic to argue that in the realm of experience nothing is either this or that but that there is always at least one more alternative. With regard to quantum theory he says,

There are no waves in the game. The equation that the game obeys is a wave equation, but there are no waves running around . . . There are no particles running around either. What's running around are quanta, the third alternative.²⁵

Quantum logic, he argues, is more real than classical logic because it is not based on a set of theoretical rules, the way we choose to think about things, but on the way we experience things.²⁶ For example, he says

If you want to envision a quantum as a dot then you are trapped. You are modelling it with classical logic. The whole point is that there is no classical representation for it. We have to learn to live with the experience.

Question: How do you communicate the experience?

Answer: You don't. But by telling how you make quanta and how you measure them, you enable others to have it.²⁶

Finkelstein seems to be making three claims:

- 1 Classical logic is a theoretical system of rules that has had the effect of constraining human thought and language in an artificial way.
- 2 Quantum logic, by contrast, arises from experience – the experience of the ultimate reality, the energy fields of quantum physics.
- 3 Subjective experience is the ultimate form of knowledge and it is strictly incommunicable by any kind of logical, and so rational, communication.

The contrast made here between classical and quantum logic is largely invalid. Classical logic is not a purely theoretical system invented-by scholars living in ivory towers who were unconcerned about any corre-

²⁴ Birkhoff, G. and von Neumann, J. 'The Logic of Quantum Mechanics', *Annals of Mathematics* (1936), 37.

²⁵ Finkelstein, D. at an Esalen Conference on Physics and Consciousness, Big Sur, California, 1976. Quoted in *op cit.*, Zukav, p. 284.

²⁶ *ibid.* Quoted in *op. cit.*, Zukav, p. 277.

spondence between their logical arguments and ordinary people's experience of life. The laws of classical logic are derived from experience of what kinds of reasoning make 'good sense' of our experience of the world. They have been a great success in this regard. The problem which now faces us is that this logic which makes good sense of the macro-world seems to fail when applied to the micro-world of atoms and sub-atomic particles. This raises the question of the relative status of classical logic and quantum logic.

The question is a difficult one. Gibbins²⁷ says that there are two opinions about it. In the view of a small minority quantum logic is supposed to be the real logic of the macro-world as well as the micro-world. This faces the problem of the tremendous success of classical logic in the macro-world, which seems to count against the validity of quantum logic at that level. The majority view is that there are two logics, each appropriate to their own domain, the micro-world and the macro-world. The problem then is how to account for the logical 'cut' between the two worlds. Unlike the case of mechanics, there is no smooth transition from one world to another in the limit of large quantum numbers.

This brings us to an interesting consideration. Which world is the 'real' world, the quantum world or the world of everyday experience? New Ager's claim that they are not reductionist, yet in their assertion that the world of quantum field theory is the real world, on the basis of which we have to interpret all our experiences, they are being just that. Why should we not turn the tables and take our experience of the macro-world as the touchstone of reality? Even better, why not accept that at different levels of complexity novel realities arise – such as individual human consciousness – which are not 'illusions'? We shall return to this question below because the answer rests on metaphysical considerations and not just physics.

A Christian Response

As a Christian I find myself in agreement with many of the negative things New Ager's say about science. However, what they are criticizing is not really science or the scientific method, but what can be called 'Scientism'. By this I mean a metaphysical construct which takes as one of its basic assumptions the belief that the scientific method is the *only* valid route to truth and that it therefore potentially provides us with a *comprehensive* view of reality. Such a construct is, of course, not a necessary consequence of embracing the scientific method and one can do perfectly good science without accepting it.

For example, the rejection of reductionism as a metaphysical stance does not mean that we have to reject the reductionist methodology of the physical sciences and the results it has obtained. What we do have to do is recognize that use of this methodology limits what can be studied and the

27 Gibbins, P. *Particles and Paradoxes*, Cambridge: C.U.P. (1987), p. 142f.

kind of answers that can be obtained. Other approaches to truth-seeking are needed if we are to understand reality in its fulness. There is evidence from within science of the limitations of a reductionist methodology. Arthur Peacocke²⁸ points out that there are scientific theories and concepts which are essential for understanding systems at a particular level of complexity, but which have no place at the lower level that results when the system is taken apart, and which cannot be explained by the theories that apply at the lower level. This, he argues, means that as systems increase in complexity truly novel phenomena appear which cannot be explained in a reductionist way. The whole is more than the sum of the parts. Nevertheless, it is still valid, and valuable, to study the parts, as long as it is remembered that this gives an incomplete picture of the whole.

Christians cannot accept a metaphysical-reductionist view of human beings – that the human person can be specified totally and solely in terms of the physics and chemistry of matter. There is a human spirit, made in the image of its Creator, which though expressed through the material body is not to be simply identified with it. However, this does not mean acceptance of a sharp Cartesian dualism. This ‘spirit’ need not be thought of as another ‘bit’ which could be discovered along with the other bits by a reductionist methodology. It is more like the meaning of this paragraph. The meaning is not to be identified with the letters which carry it. No amount of study of the individual letters, or even words, in isolation will reveal the existence of the meaning. It can be found only when the paragraph is taken as a whole. Of course the meaning will disappear if the letters are erased. However it will not cease to exist because it still exists in my mind. I can express it again, perhaps in different letters (Greek or Hebrew). This is a helpful analogy for thinking about the Christian doctrine of bodily resurrection. It also seems to be in accord with the biblical presentation of the human person. Wheeler Robinson sums up the view of Old Testament scholars when he says that ‘The Hebrew idea of personality is that of an animated body, not (like the Greek) that of an incarnated soul’.²⁹ The use of the more extensive Greek vocabulary for parts or aspects of the person in the New Testament might give the impression of a shift to a less unitary view, but a study of the use of them shows that this is not so. This ‘animated body’ view of the human person lies behind the concept of resurrection of the body (as against existence as a disembodied soul) as the destiny of humans. As well as avoiding a sharp dualism, this view avoids the monism of New Age thought which declares that matter is an illusion and identifies consciousness with the energy field that is supposed to be ultimate reality.

Reductionist philosophies have great difficulty in preserving any concept of human dignity because their logical end is the conclusion that

28 Peacocke, A. *God and the New Biology*. London: Dent & Sons (1986), chs. 1&2.

29 Robinson, H. W. *The Christian Doctrine of Man*, 3rd ed., Edinburgh: T. & T. Clark (1947), p. 27.

we are nothing but robots programmed by the impersonal laws of physics. It seems that some New Agers regard the suggestion that the consciousness of the observer affects the matter which is observed (at least at the atomic level), as a way out of the mechanistic strait-jacket. However, it is an illusory one. By identifying consciousness with the quantum energy field they make it something which is determined solely by the laws of physics. If appeal is made to the probabilistic nature of quantum events, it must be pointed out that this does not provide a basis for belief in free, responsible behaviour. Rather it suggests random, capricious behaviour. For Christians, the basis for human dignity is the belief that each individual bears the image of God. It is this 'image bearing' nature of humans which gives Christians (and gave the early modern scientists³⁰) confidence in human rationality and objective truth, as will be argued below.

The evidence of the inter-related oneness of all things, at least at the sub-atomic level, provided by the testing of the Bell effect, does not cause me, as a Christian, any problems. If the universe is the creation of the one and only creator, who constantly keeps it in being, one might expect there to be a fundamental coherence and unity about it if, as Christians believe, that creator is a being whose actions are characterised by rationality and reliability. Moreover, the Christian concept of God is a trinitarian one, that the one God is a harmonious inter-relationship of persons. It is not surprising if the creation reflects something of this as, like all great works of art, it reflects something of its creator's nature.

The assertion that because of this inter-connectedness of all things, the separate parts into which we, with our analytical thinking, divide the universe are unreal is, however, problematic. It does not seem to follow from the physics. Capra *et. al.* seem to postulate this solely on the basis of their monist metaphysics. On the basis of a trinitarian metaphysic one can postulate the view that it is possible to have a harmonious unity within which there is no loss of diversity and individual identity.

This brings us back to the question raised at the end of the discussion of classical and quantum logic. Which world is the 'real' world – the micro-world or the macro-world? The world of undifferentiated quantized energy fields, equated with a universal consciousness, or the world of differentiated, individual, personal consciousnesses?

In the preface to *The Tao of Physics* Capra tells us why he takes the option he does. The reason has nothing to do with science. It is 'a beautiful experience' he had one summer afternoon sitting by the ocean when he felt the atoms of his body participating in the 'cosmic dance of energy'. On this basis he makes a leap from physics to metaphysics, identifying the *physical* energy fields of quantum theory with the *psychic or spiritual* energy about

30 See, for example: Brooke, J. H. *Science and Religion—Some Historical Perspectives*, Cambridge: CUP (1991); Hooykaas, R. *Religion and the Rise of Modern Science*, Edinburgh: Scottish Academic Press (1972); Jaki, S. *Science and Creation*, Edinburgh: Scottish Academic Press (1974); Russell, C. *Cross-Currents*, Leicester: IVP (1985).

which mystics speak. He has every right to do this, but he does not really seem to be aware that he is making a major assumption here. Capra makes no attempt to justify this assumption, except by pointing out apparent parallels between statements of mystics and of modern physicists. Richard Jones³¹ criticizes him for a very selective and superficial, and therefore misleading, use of Eastern mystical philosophies.

A Christian has as much right as Capra to choose to understand science within his or her own metaphysical framework. In this case it is belief in an infinite, self-existent, personal God who created an ordered universe and sustains it in being. Hence there is an objective reality which exists independently of human minds. Humans were created in the image of God. Therefore our minds correspond to God's and can understand the universe and the order which characterizes it. Of course our understanding of reality will always be limited (because of our finiteness) and distorted (being coloured by our beliefs and opinions). That, however, does not make the search for objective knowledge pointless. It does mean that we have to accept that at any one time our knowledge is only a provisional approximation to the reality we are studying. Since all humans are rational beings sharing God's image and experiencing the same created, objective world it seems reasonable to expect that experience to be communicable in a rational way, even if an exhaustive account of the experience cannot be given in this way.³²

Moreover, the trinitarian view of God makes the ultimate reality a unified, yet differentiated, personal consciousness. Therefore the Christian will not be prepared to reject the differences manifest in the macro-world as illusory. Nor, as we have seen above, is there any need to deny the reality of the unity displayed at the sub-atomic level.

There are two significant differences between appeal to the theistic Christian metaphysical framework with regard to science and appeal to the monistic metaphysics of the New Age. The first is that the Christian framework is open to at least a degree of public verification, since at the heart of Christianity lie the historical events associated with Jesus of Nazareth as recorded in the Christian Gospels. The New Age framework rests on an incommunicable subjective experience. The second is that modern science grew up in, and was to a considerable degree based on, the Christian framework.³⁰ The New Age framework, as Zukav⁵ recognizes, will ultimately bring about the end of science.

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31 Jones, R. H. *Science and Mysticism*, London: Associated University Presses (1986), pp. 201–204.

32 Helm, P. (ed.) *Objective Knowledge: A Christian Perspective*, Leicester: IVP (1987) contains a collection of essays which are very relevant to this paragraph.