

## *Is the Universe in a State of Pilgrimage?*

**Chris Clarke**



In this article Chris Clarke gives the arguments from a mainstream cosmological and scientific perspective, between two world views: a passive universe whose content may be classified, analysed and definitively described; or a dynamic participatory cosmos, whose knowing is a question of lived experience.

***(The essay makes reference to a Process and Pilgrimage inquiry at Birkbeck College 31<sup>st</sup> May 2009 that brought together Basil Hiley's work on the mathematics of process and Satish Kumar writing on pilgrimage. Other speakers at the event included Françoise Wemelsfelder, Brian Goodwin and Philip Franses.)***

### **1. Is the universe in a state of pilgrimage?**

I want to begin with this rather bizarre question in order to focus our thinking.

Most scientists would probably object that this cannot be so, because "pilgrimage" – as Satish Kumar explained earlier – is a free decision to move out into the unknown, to place oneself in a state of unknowing in order to know more deeply. It is an act defined by essentially human qualities and thus impossible to attribute to a thing like the universe. Such a suggestion, scientists might say, is an example of *projection*: an immature psychological tendency to impute to other people or things your own desires and emotions.

The charge of projection was carefully critiqued by Françoise Wemelsfelder<sup>[1]</sup>, in her presentation which rigorously demonstrated that many human emotions and behaviours can be attributed to farm animals with just as much validity as can be assigned to our attributing them to other humans. So the further question that I am posing is, can this attribution of human qualities be extended further from animals to the cosmos, and if so, can the notion of process include aspects that we think of as pertaining to pilgrimage? I should add also, how are we to develop a "science of qualities" if we are afraid of "projection" in the face of any extension of human subjective states?

At the heart of the orthodox objection to such extensions lies, as Françoise pointed out, the claim that acts such as "decision" are subjective, while physical objects such as the universe are "inanimate" and as a consequence can only carry objective properties. The idea of "objective" used here could have at least three possible meanings:

- 1) *Objective* is that on which a consensus can be reached by many (ideally all) people, rather than only being accessible to one person. This certainly defines a useful criterion which science could choose to stick with. But, as I shall argue next, there is nothing in it which would in itself block the extension of human qualities. I shall refer to this sense as "universality".
- 2) Alternatively, *objective* could be taken to mean knowledge that is independent of subjective awareness, and thus limited to the formal content of what is experienced as opposed to its *subjectivity*, in the sense of how it "feels". I would argue, however, that subjectivity can, and should, be regarded as extensible to other people and can thus be objective. This is because our very first task in being human is to learn to share subjectivity with our primary carer. The carer and the child are face to face doing just this, and this activity can then extend to sharing their subjective reaction to a third object, such as a toy, present to both. Though language will soon be added in the form of vocalisation, this sharing of subjectivity is prior to language and forms the foundation of our humanity.

3) Finally, *objective* may carry the implication “precise and rational”, while *subjective* may carry the implication “fuzzy and emotional”. I strongly wish to exclude such implications here. If science were to address subjectivity it should, and can, address it with a clarity equivalent to that of current science: *clarity* is an appropriate word for this sense.

There is, however, a distinction between subjective knowing and objective knowing (in sense 2) that can be confused with gratuitous fuzziness. Objective knowing is governed by conventional (Aristotelian) logic, while the former (as I shall describe shortly) is governed by a different, context dependent, logic.

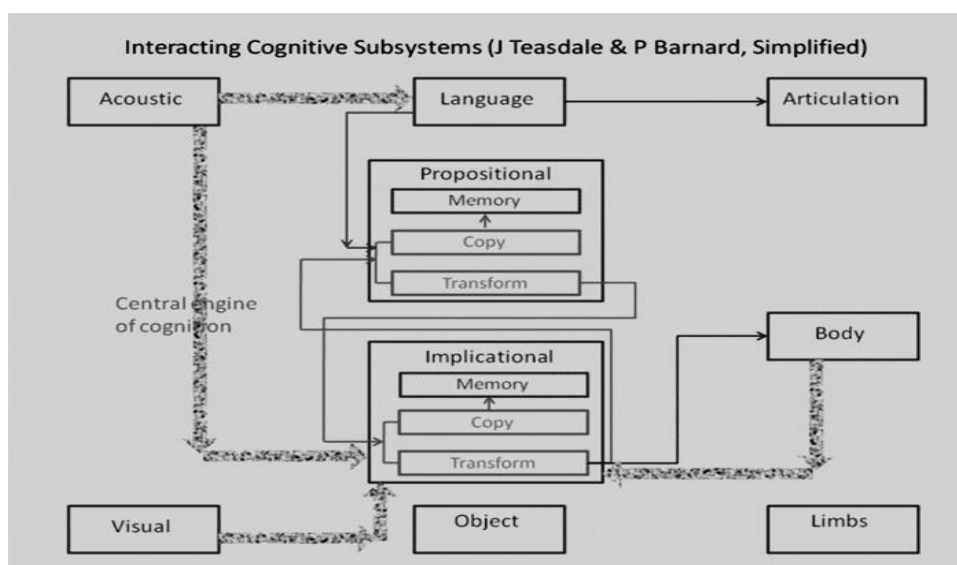
**2. A model for knowing**

In order to get the distinction between subjectivity and objectivity in sense 2 clear, and to shift to less ambiguous terminology, I will introduce one particular model of knowing, due to Teasdale and Barnard [2]. The model describes the function of the human mind/brain, not its physiology, with evidence being derived from clinical practice and detailed experiments in cognitive psychology. It is sufficiently simple to be grasped as a whole, but sufficiently detailed to account for the main features of experiments in cognitive psychology and clinical data [3].

The basic assumption is that the evidence can be accounted for by representing the brain/mind as composed of several inter-communicating subsystems, each dealing with a particular sort of mental data. The data from all of our senses, for example, is dealt with by a set of low-level processing subsystems, one for each sense, which then pass on the results of a preliminary analysis to higher order subsystems. All the subsystems have the same general structure. They contain their own memory store appropriate to the nature of the data being stored.

The main feature of the model is the proposal that our thoughts and behaviour can be understood as being governed not by a single top-level “self” but by two top-level meaning systems working in tandem which they term the *Implicational Subsystem* and the *Propositional Subsystem*. The Implicational Subsystem is concerned with broad conceptual schemata regarding the significance and implications of data for the person’s status and well-being, which it derives from direct input from lower-level subsystems processing sensory data and from the propositional subsystem. Reciprocally it has direct access to the memory records of these subsystems.

The Propositional Subsystem is concerned with statements of fact. It derives its input from the language processing subsystem and from the Implicational subsystem. (See diagram below, illustrating the connections involving these two top subsystems). This architecture of connections explains why, for example, flash-backs of experiences in Post Traumatic Stress Disorder are quite different from ordinary autobiographic memory: the former derive from the Implicational subsystem which has access to comparatively “raw” stored sense data and are unencumbered by any qualifying narrative, while the latter derive from the propositional subsystem where sense data have been reprocessed and integrated in a narrative



### 3. Our two ways of knowing

As Kant showed us, the world as we know it is necessarily limited by our capacity to know. This is not so much a matter of the limitation of our senses (which have been enormously enlarged by science) but of the limitation of our meaning-making systems. Whatever information we get from our unaided senses and from scientific investigation is filtered through our two main subsystems. Both are equally vital: the implicational gives us our sense of immediacy, reality and significance, and the propositional embeds this with a coherent story. The language of science, as we know it at present, concentrates on the propositional side and develops and refines the “story” into the theories that have been so successful. The alternative, of moving language closer towards the knowing of the implicational subsystem, as is done in poetry and novels, has been regarded as totally distinct from, and incompatible with science. The human being views the world through a window with two panes, one of which has been entirely neglected by science: the implicational pane of value and meaning.

Because our viewpoint is selective, that does not mean that it is erroneous. On the contrary, these cognitive subsystems would not have evolved in us if they did not enable us to engage effectively with the world. Thus we would expect that they will both embody reflections of the world: our physical world and our social world. In the light of evolution, it would be absurd to suppose that the propositional faithfully reflected the full reality of the universe, while the implicational was completely irrelevant. The questions before us are, what are the domains of applicability of these two ways of knowing, and how do we integrate them, and the languages that we have adapted to them, into a “new language of science”?

For this to be a language *of science*, one which builds on the scientific achievements of the past, I suggest that we look for *universality* and *clarity* over both ways of knowing. The nature of this clarity will be different as between the two subsystems. The clarity of the propositional requires classical logic and rigour; the clarity of the implicational requires discernment and emancipation from self-centredness.

### 4. Quantum theory as a bridge between subjectivity and objectivity

Surprisingly, quantum theory, which one might think was so far removed from our everyday life as to be largely irrelevant to the implicational, has two aspects which bridge the two ways of knowing, and even suggests that the universe is in a state of pilgrimage! I will describe these in turn.

(i) *The logic of quantum theory is context-dependent.*

All ordinary language uses context-dependent logic. The truth of the statement “the cat sat on the mat” depends on what cat, which mat, and when. As Philip Franses will describe in the next talk, the efficiency of normal language depends on our ability to quietly hold the contextual ambiguity of each statement and allow it to resolve in the course of the flow of the conversation.

Conventional scientific language, as used in published papers, tries to limit this context dependence – for instance, by first citing past papers which stand in a line of tradition in which terms have been defined. Although much of the contextual ambiguity of ordinary language still remains (without it the paper would be almost unreadable – take a glance at Russell and Whitehead’s *Principia Mathematica*) there is an assumption that in principle this ambiguity could be eliminated and one would achieve the perfect structure of Aristotelian logic. This uses what is often loosely called “either-or” logic: every grammatically proper statement is either true or false but not both. (The contrary of this is loosely called “both-and” logic.) Moreover a standard set of rules of inference allows one to get from one set of statements to another, so that if all the statements in the first set are true, then all the statements in the second set are true.

Since the early twentieth century a variety of alternative logics have been proposed in which truth depends on context or where the “either-or” of truth does not hold<sup>[4]</sup>, or both. I find it striking that, independently, there have been proposals that quantum theory obeys one of these alternative logics and that the “unconscious” (corresponding to the implicational) obeys an alternative logic. There are differences between the logics proposed in the two cases, but there is a strong common theme of context-dependence.

The logic of quantum theory is different according to what version of quantum theory you are using (a further twist to “context dependence”!) Quantum, theory is a protean beast that is used in many different forms. In its early days, prior to 1926, there was an emphasis on what was called “wave-particle duality”- the idea that “things” could manifest either as waves, which interfered with each other when they passed through slits, or particles which had a definite position. These two incompatible manifestations seemed to indicate a sort of duality. From 1926-1927 Niels Bohr developed a theory of “complementarity” which, restated in modern terminology, says that certain pairs of properties of (quantum) systems are incompatible, in the sense that one cannot consistently specify both of them at once. While complementarity is an immensely fertile idea; “wave-particle duality” is not because “being a wave” and “being a particle” are conceptual schemes, not properties. Moreover, these particular schemes are wrong because they rest on the related fallacies of what Whitehead<sup>[5]</sup> called “simple location” and “misplaced concreteness”: electrons are not “things” in the sense to which we are used. But, given these problems and peculiarities of quantum phenomena, was there any rational logic behind it, or was it simply anarchic?

The first formulation of a quantum logic was founded by Garrett Birkhoff and John von Neumann in 1936<sup>[6]</sup>. Their idea was simply to take the formalism of classical logic, as it had been formulated up to that date, and apply it to propositions, like “the electron is in the right half of this box”, referring to the state of a (quantum) system at some given time. Their focus was on deduction: given one particular proposition, what other propositions can you validly deduce from it? They found that they could establish most of the normal rules of deduction, with one exception. Chris Isham illustrates this exception with the example of a restaurant menu. Suppose your menu offers a special breakfast deal with either fried eggs or poached eggs, and sausages. You order fried eggs and sausages, only to be told that this is not part of the deal. Somewhat miffed you switch to poached eggs and sausages, only to be told that this too is not part of the deal. As you protest, the waiter then points out the tiny footnote on the menu saying that quantum logic is used in this restaurant, and reminds you that in quantum logic, given the proposition “ $(F \text{ or } P) \text{ and } S$ ” it is not necessarily the case that “ $(F \text{ and } S) \text{ or } (P \text{ and } S)$ ”. This gap in the possibilities of deduction was regarded as so fundamental that the consensus has been that quantum logic is a logic only in a very formal and misleading sense of the word “logic”.

The situation changed in 1998 with a seminal paper by Chris Isham and Jeremy Butterfield<sup>[7]</sup> which used a very broad generalisation of classical logic, known as topos logic<sup>[8]</sup>, which explicitly brought in context dependence. This concurred with the original approach of Bohr to complementarity, in which he regarded each instance of observation as a distinct context, where only certain properties made sense in any given context. Isham and Butterfield regarded these instances as distinct “windows” on reality; and they added the vital addition from topos theory that truth could be a matter of degree and was not an either-or thing, This certainly agrees with our everyday usage. We are rarely 100% certain about the truth of a proposition and we may well hedge our evaluations of proposition with qualifications – “yes, true provided that ...” introducing qualitative as well as quantitative “degrees of truth”. This addition made context-dependence more flexible, allowing the degree of truth of a proposition to change progressively with the context.

(ii) *The logic of the implicational is context dependent*

In the 1970s a book was published by the Chilean psychoanalytic psychologist Ignacio Matte Blanco in which he argued that the unconscious manifested as if it was governed by a different logic from that of the conscious mind. The most natural way to approach this novel logic is, I think, through the idea of association. The association of ideas is a standard tool of psychoanalysis and something we are also familiar with in our everyday life. If we add the notion of context to association we get a relation of association-in-a-context. Suppose, for example, the context is that of “parenthood”. In that case, if I first thought about my brother in that context then I might next think, by association, of his son, my nephew. Conversely, if I were to start thinking of my nephew in the context of parenthood, I might next associate him with my brother. The unconscious is thus working with an associational relationship.

What is happening is that whereas in ordinary logic “parenthood” is an *asymmetric* relationship (if I am the Father of John, this John is not the Father of me), here the unconscious has converted it into a *symmetric* relationship. Matte Blanco’s claim is that this is the best that the unconscious can do: *the unconscious treats all relationships as if they were symmetric*. If we add to this action of the unconscious the action of the conscious mind, which has a full range of relationships, then the two processes will weave together to produce what

Matte Blanco calls a *bilogic*, composed of a symmetric logic of the unconscious mixed with an asymmetric logic of the conscious.

While it would be facile simply to identify the Freudian unconscious with Barnard's implicational, it is clear that any implementation of the function of the unconscious in their model will heavily involve the implicational. Indeed all the evidence for Matte Blanco's symmetric logic equally provides evidence for a symmetric logic in the implicational.

Bilogic acts to merge concepts together: it causes distinctions to blur and boundaries to disappear. Complete dissolution into a sort of universal haze is prevented only by the control of the propositional and the influence and guidance of the context of thinking at each moment. The context determines what symmetrical relationships are in action. Also, symmetric logic acts to identify the part with the whole, where what is meant by "the whole" is determined by the context, the current, but constantly changing, horizon of discourse.

(iii) *Both the implicational and quantum theory are trans-temporal.*

Time is by its very nature non-symmetrical, and thus it does not survive into the implicational. This contributes strongly to the disturbing nature of the flash-backs in Post Traumatic Stress Disorder, referred to above: they emanate from the implicational, where there is no time, and thus appear as if they were present. So the sufferer feels as though there is no escaping an event that is constantly present.

Similar things happen in quantum theory, such as the symmetry of future and past in quantum formalism. In addition the phenomenon of entanglement, often erroneously described as "instantaneous", is in fact non-temporal: the Bell inequalities can be extended to the temporal Bell inequalities and what is observed is a correlation between distant states which is indifferent to past, present or future relationships. John Wheeler, in his arguments for a process in which present observation brings into being past manifestation again underlines the non-temporality of the theory.

## 5. What is going on here?

If we were not starting, historically, from here – "here" being only just past the climax of Cartesian enlightenment culture – the remarks just made might suggest that the foundation on which rests our world (the world as it is manifested to and by us humans) is characterised by fluid context dependent logic and by subjectivity; and that within this we have carved for ourselves an ecological niche in which this fluidity is tempered by a structure of rationalistic language.

But, since we do start from a Cartesian inheritance, we can move forwards from here by exploring a synthesis between a language which is autonomous and totally rationalistic, and a language that places itself also at the service of the implicational. Some further points might offer a lead in this direction.

(i) Quantum theory as we currently have it, vested as it is in a massive abstract rational structure, is incomplete.<sup>[9]</sup> The clearest sign of this is seen in quantum cosmology. There is stronger evidence than I would have believed possible 10 years ago that the universe originated in a completely symmetrical quantum state. Moreover the movement of the universe away from this state of complete symmetry seems to have the structure of the quantum fluctuations that one observes when examining, say, a laser beam. But such quantum fluctuations arise as a result of the interaction of the laser beam with a particular sort of quasi-isolated massive subsystem of the universe (A.K.A. an "observer"). So where do the observers come from? From the fluctuations. This circular story is consistent; but a universe that just sits there in the perfection of its symmetry is also consistent. This is, of course, one version of The Problem that has in many forms driven Western philosophy from Plato onwards. Leibniz' version was "why is there something rather than nothing?"<sup>[10]</sup> We need some principle of be-ing, by which I mean the positive action of standing out as existent.

(ii) The implicational is our vehicle for recognising be-ing. It presents us, in a full blast through our senses, with isness. We grasp be-ing by extending our subjectivity to embrace the other than stands before us, recognising – whether this thing is a human or a rock – that, as Martin Buber put it, "it is a Thou and fills the heavens". An

other thus embraced has “meaning” for us, in the sense of significance; it carries implications for our own being<sup>[11]</sup>.

(iii) The triad of meaning-being-subjectivity seems to fit badly with the rational formalism that we have developed in physics, with astounding success, as far as it goes. But I think we have a clue as to how to accommodate it in David Bohm’s duality of “Soma” and “Significance”<sup>[12]</sup>. He suggests that we can consider, perhaps by arbitrary choices, the universe to be structured into a hierarchy of successive orders or layers of organisation, from the smallest to successively larger ones. At an interface (we can here think of ourselves interacting with, i.e. “observing” a microscopic system, or ourselves looking out to discern our own place in the universe) the larger and more complex order reacts to the smaller and simpler layer with that layer standing in the role of matter (soma). The smaller, simpler layer, on the other hand, reacts to the larger layer with that layer imparting significance to the smaller one. Thus the distinction between subjectivity and form is not an intrinsic distinction, but a result of a particular structural viewpoint.

(iv) The be-ing which characterises engagement with significance is not in itself a process in time, because there is no time in the implicational. But in its nature as act it is reasonable to call it process. Basil Hiley, in his talk, argues cogently that *process* is at the heart of fundamental physics. Process comes before time. The underlying dynamic of the universe, then, which we need to discern in addition to its structural form, is one of process, occurring at all levels. Moreover it is process that is driven and characterised by subjectivity. It is in this sense that I suggest that the universe is in a state of pilgrimage.

---

### References

- 1 Wemelsfelder F. et al. (2001) “Assessing the ‘whole animal’: a free choice profiling approach” in *Animal Behaviour* Vol 62 Issue 2
- 2 Teasdale J. and Barnard P. (1993) *Affect Cognition and Change: remodelling depressive thought*. Hove: Lawrence Erlbaum Associates
- 3 Barnard, P.J. (2004) ‘Bridging between basic theory and clinical practice’ in *Behaviour Research and Therapy*, 42, 977-1000.
- 4 Goddard L. and Routley R. (1973) *The logic of significance and context. Vol.1* Edinburgh : Scottish Academic Press,
- 5 Whitehead A. (1925), *Science and the modern world*, Macmillan
- 6 Birkhoff, G. von Neumann, J. (1936) “The logic of quantum mechanics” in *Ann. of Math.* 37, pp. 823-843.
- 7 Isham, CJ, Butterfield, J, (1998) “A Topos perspective on the Kochen-Specker theorem: I. Quantum states as generalized valuations” in *INT J THEOR PHYS*, vol: 37, p. 2669 – 2733
- 8 Goldblatt,R. (1984) *Topoi : the categorical analysis of logic*, North-Holland,.
- 9 Clarke C. (2007), “The role of quantum physics in the theory of subjective consciousness” *Mind and Matter*, 5, 45-82
- 10 “Why is there something rather than nothing? For nothing is simpler and easier than something. Furthermore, assuming that things must exist, we must be able to give a reason why they must exist in this way, and not otherwise.” Leibniz, “Principles of Nature and Grace, Based on Reason” (1714), Section 7 (Leibniz, *Philosophical Essays*, Hackett, 1989, p. 210.)
- 11 Buber, M (1958) *I and Thou* Edinburgh: T. & T. Clark
- 12 Bohm, D. (1987) ‘Soma-Significance’ in *Unfolding meaning: a weekend of dialogue*, Ed. Donald Factor, Routledge

**Chris Clarke** has had a largely academic life, working mainly on Einstein's theory of gravitation at the universities of Cambridge, York and Southampton, where he was professor of Applied Mathematics. He left that in 1999 and since then has worked freelance on the connections between science and spirituality — producing four books and a variety of essays, while helping in charitable foundations related to this area. He is based in Southampton, UK, and runs workshops throughout SE England, or residential courses elsewhere. Quantum theory, including quantum cosmology, entered his activities intermittently, with work on both its philosophical and its technical aspects. While he was at Southampton a chance conversation led to his spending a couple of years working on the physics of the human brain. These topics started to build up a view of the world in which cosmos, brain and spirit made a unified system.



[www.scispirit.com](http://www.scispirit.com)