Patrick A. Heelan
State University of New York

Space as God's Presence

Introduction

Religious Experience and Religious Symbols

It is not surprising that different individuals, traditions and cultures experience the religious dimension of life in different ways. Since religious experience is a divine communication, the study of religious experience is concerned with channels of communication between God and his peoples; different channels, presumably, serve different cultures and historical communities. I take it that religious experience is an experience of a certain kind—of a religious kind. The phenomenology of this experience, I take to be, that it deals with a sense of loving dependency on some Being other than oneself for life's ultimate meaning, some Being in whose presence one stands in unqualified awe and with a sense of sin.

Religious experience may or may not be accompanied by an "oceanic feeling". Mystical experience of a higher order may be characterized by such a feeling, but the religious experience I am concerned with, is not a higher order experience, but the religious experience of ordinary religious folk. I want to set forth the view that—insofar as religious terms have public meaning—the object of religious worship, God, is experienced only through channels which are both appropriate and public: these channels are religious symbols. These channels are themselves metaphors of the experienced object, and more than metaphors, they testify to the presence of a reality so described.

There are, according to Paul Ricoeur,[1] primary and secondary religious symbols. Primary symbols are natural objects used to describe

1. The following paragraphs draw from the work of Paul Ricoeur, particularly Ricoeur (1967), (1978), and (1981); especially relevant is chapter 3, "Hermeneutics of symbols and philosophical reflection," pp. 36-58 in Ricoeur (1978); for the titles of books vide the accompanying References of Books.

the character and presence of a divine object or relationship; other religious symbols, such, for example, as the myths, stories, rites and practices of particular religious communities, are secondary. The Myth of the Fall of Adam, for instance, is a secondary symbol of the character of sin, while its primary symbol is that of a *stain* on the spirit.

Can we draw on modern science or scientific cosmology for primary religious symbols? If so, how do we make them speak? And what do they say?

A symbol, whether primary or secondary, always has a primary and a secondary intention: its primary intention is that which does the symbolizing, its secondary intention is that which is symbolized. There is then similarity and difference between the two intentions, but these are not articulated: articulation may come on later reflection. Just as in a metaphor, then, these two senses are inextricably tied together: what is said through the symbol, cannot be said in any other way. A symbol then is an elementary mode of expression, a primitive attempt to give or obtain access to a new level of meanings, and to the presence which corresponds to these meanings. It is then a primordial kind of experience, the giving of something not understood in its own terms, in terms of something with which we are familiar in its own terms. The symbol comes before all conceptual articulation, or theorizing about what it is that is meant by the symbol. "A symbol", as Ricoeur says, "invites thought",[2] it is an invitation to reflect and theorize about the domain of what is symbolized. Religious symbols then are a starting point for theology.

Meditation on religious symbols, gives rise to theoretical accounts —theologies—of that to which the symbol refers. Such theoretical accounts are never adequate to the starting point. Even if descriptive, theoretical accounts tend to lose touch with the richness of the primordial situation. The starting point then always has "Surplus meaning" *vis-a-vis* all theoretical accounts. For example, sin conceptualized, say, as transgression of God's law, loses the feeling conveyed by the sense of spiritual stain that sin has a certain ontological, thinglike, character. Moreover, the fact—a stain—that is symbolic of the primordial experience becomes something other than a mere matter of fact, it

2. Ricoeur (1978), p. 37; also see Ricoeur (1967).

becomes a mode of access—a gateway, a window—to a new mysterious region, that of sin. A stain is no longer just a stain, it is subtly changed by its link to sin; likewise, a sin is not just what any theology says it is, it is something closer to a physical stain. Physical facts have surplus meaning because of their capacity to become symbols. Theoretical accounts explaining symbols, obtain their warrant—their experiential warrant—from what these describe, but no theory can exhaust the surplus meaning of the symbol, because, as I have said, no theoretical account can exhaust a primordial experience.

The Hermeneutic of Religious Symbols

The pursuit of understanding of that which a symbol gives is a *hermeneutic* endeavour.[3] It comprises three stages, as Ricoeur explains:[4] (1) a *phenomenology* of the symbol, this prescinds from (or "brackets," in Husserl's terminology) belief in the symbol as disclosing truth; a phenomenology is a study of the appearances expressed by symbolic expression; (2) an *acceptance* of the validity of the symbol as disclosing truth, this implies a need for involvement, itself a condition for the process of interpretation called a "hermeneutical circle", of which the first principle is, "you must understand in order to believe, and you must believe in order to understand"[5]—to believe, in this case, is to experience; and (3) a stage of *philosophical* reflection giving rise to thought, that is, to theoretical, in this case, theological understanding.

To obtain theological understanding, mention should be made of two forms of hermeneutical approaches to the religious symbol that must, on this account, be taken as spurious: these are *allegory* and *gnosis*. In allegory, articulated thought is assumed to have existed *before* the symbol: the symbol would in this case be an artifact, constructed to represent or model a particular prior interpretation. In gnosis, the symbol is dogmatized as a secret knowledge, it is identified in some way with what it symbolizes, it is, consequently, divinized. In one respect, the gnostic process is like failing to distinguish a few pencilled lines drawn on paper from the depicted object revealed so

3. See Bleicher (1980) where references will be found to the principal works of Heidegger, Gadamer, Ricoeur, and other writers in the hermeneutical tradition.
4. Ricoeur (1978), pp. 44-51
5. *Ibid.*, p. 45

clearly to a viewer prepared to interpret these lines pictorially. To the contrary, I take interpreting a symbol to be like "reading" the lines of drawing, or better still, reading a book or text; this is the kind of hermeneutics to be brought into play, with one important difference, however, a symbol also has the power to show presence. Allegorical and gnostic interpretations, I then take to be failures of the hermeneutical process. I find this failure to some degree in many religiously oriented scientific authors, as I shall point out, among them Isaac Newton, Baruch Spinoza, Albert Einstein, and among some living and writing today, such as Fritzhof Capra, Alex Comfort and others.

Among the authentic forms of understanding are *demythologization* and *theory formation*. Demythologization happens when the symbol is recognized for what it is, as a special kind of "text" to be read as referring to something other than the symbolizing facts. Theory formation is the construction of a conceptual model, to be tested in the primordial experience, and refined by a process of hypothesis, test, refined hypothesis, refined test, and so on, until the particular goals of understanding are fulfilled. According to Martin Heidegger,[6] the form of hermeneutical inquiry is the hermeneutical circle: the (meaning of the) whole is determined by the parts, and the (meaning of the) parts is determined by the whole. This circular process is not a vicious or logical circle, but a "virtuous" or interpretative circle. It has three subjective components: (1) *Vorhabe* (or fore-having): this is a specific tacit (conceptually unarticulated) embodied set of subjective conditions of our being-in-the World. Since the World is the public domain of our experience, it contains among them the conditions for the correct use of descriptive language. (2) *Vorsicht* (or fore-concept): this is the conceptual articulation and the linguistic resources (in something like the structuralist sense of *langue*) which one brings to the understanding to the text or symbol. And (3) *Vorgriff* (or fore-grasp, or fore-hypothesis): this is a clue to how the concepts relate to the text or symbol.

Thus a hermeneutical circle is the process whereby we come to assimilate a not-yet-understood experience into the conceptual categories of already-understood-experience, or we move to enlarge the conceptual categories with which we understand our World so as to bring the not-yet-understood experience into our World now enriched by

6. See Heidegger (1962), particularly p. 194, and Gadamer (1975)

new differentiations. Note, then, that either a new religious symbol will be interpreted by the old, or it will result in a radically new re-interpretation of both old and new.

A primary symbol is some experiential fact or aspect of the natural world that serves as a religious symbol. Among such, historically, is the Cosmos, and its universal conditions of Space and Time. To become a religious symbol, the Cosmos must be experienced as having a kind of reality that is loaded with religious feeling or significance. The Old Testament is full of such imagery: the Cosmos carries God's Word to His people. "On that day, I will respond, says the Lord. I will respond to the heavens, and they shall respond to the earth. The earth shall respond to the grain and wine and oil, and these shall respond to Jezreel" (*Hosea* 2/23-24). One knows that the author pictured God as up there in the heavens sending His message down through the celestial space to the earth, where it is delivered to mankind by the living and growing things—corn, vines and olive trees—on which he depends for food.

Finite Cosmologies

For longer than two thousand years the Cosmos for Western peoples was experienced to be earth-centred and of finite size. Such was the Cosmos for which Plato, Aristotle, and the aristotelians of the Middle Ages constructed a model of eight or perhaps ten crystalline spheres which carried the Moon, Sun, planets and stars in concentric orbits around the earth. Beyond the Stellatum, the last of the visible spheres, was the region of the *primum movens*, the unique and universal final cause of all motion and change under the heavens. Beyond the Stellatum, there was, according to Aristotle, Aquinas, and the medievals, no space because what was in space had to have a place, and to be in a place was to be contained by a container; since there was no further container beyond the Stellatum to contain it, there was neither place nor space beyond the stars. In modern mathematical terminology, the finite universe constituted a non-Euclidean three-dimensional space of finite diameter.

The ancients and medievals experienced their world this way perceptually. On what was this perception based? Could we today experience perceptually this kind of space? When one looks up at the skies: the sun appears as a disc not many miles away, the moon like-

wise, and all the heavenly bodies appear to turn in spherical orbits around a stationary earth. The heavens look like a vault, and from a high point the earth and sea have the shape of a saucer with the rim at the level of one's eyes. Nearby space has roughly the character of physical space, that is, Euclidean, but depth falls off with distance from the observer, and eventually distant objects appear to be without depth, papered, as it were, on a sphere of finite size surrounding the observer. The phenomena just described can be explained by the theory[7] that we estimate distance visually, using cues dependent on (binocular or monocular) parallax (this is the convergence of rays of light from a distant point either on the two eyes or on the pupil of a single eye). According to this account, visual spaces would not be Euclidean, but would exhibit the geometry of a family of hyperbolic Riemannian spaces of finite size: physical space would then appear as mapped on some member of this family, the member of this family brought into play at any time being a function of the visual purpose pursued at that time. In this account, the spaces of visual perception are related to the hermeneutical goals of the visual subject, and I would go so far as to claim that in fact perception is always hermeneutical.

This finite visible universe of the ancients and medievals, different though it be in structure from the one Newton, Galileo, and even Einstein, taught us to believe in as the true physical universe, should then be taken as something more than an imaginative but unverifiable construction, it can be taken as a true but primitive form of human, principally visual, experience of the Cosmos. As an archaic divine symbol, it pointed upwards beyond the Stellatum to that other but non-spatial immobile centre on account of which and for love of which all change took place under the stars; the First Cause of all movement and change, God. Such was the Cosmos described by Dante in *The Divine Comedy*, and interpreted so beautifully within the literary tradition of the Middle Ages by C. S. Lewis in *The Discarded Image*.[8] In the *Paradiso*,[9] Dante is conducted on a journey beyond the Stellatum to God's home in the Empyrean: he pauses when he reaches the starry sphere and looks back at "this our threshing floor"; behind and below him, he sees one centre, the dark disc in the neighbourhood of which Satan reigns, and in front and above him he sees the circles of

7. See Heelan (1982), chaps. 3-6, and Appendix
8. Lewis (1964)
9. In White (1948), pp. 177-178

the angelic choirs, and at their centre, "a point of radiating light, so piercing, that the eye on which it smites must close perforce by reason of its glow", this is God's home. It was this kind of universe that Thomas Aquinas presupposed in his theological synthesis: without its everpresent imagery and symbolism, it is scarcely possible to understand Thomas' theology, for example, of actual grace, and much of his metaphysics.[10]

Infinite Universes

The thought that the physical universe was perhaps infinite is very old. We find this view proposed by Melissus and Democritus among the ancient Greeks, and Lucretius and Epicurus among the Romans: these were the atomists. They held that the world was not as it appeared, but was in fact composed of tiny invisible atoms moving or clinging to one another in an infinite Void. The proponents of atomistic theories were irreligious, they rejected the gods, and for two thousand years, the gods rejected them. During this period, atomism remained an unverified theory, a mere conceptual model or philosophical hypothesis; it was not a way of experiencing the world. This situation lasted until the end of the Middle Ages and the beginnings of the Southern Renaissance. Then, suddenly in the middle of the fifteenth century in Italy, we find people—artists and viewers—who experience the world as infinite and Euclidean, and who try to represent the space of such a world on canvas. The use of mathematical perspective in Italy in the middle of the fifteenth century (invented by Brunneleschi, Alberti, or one of their contemporaries) signifies that people were already experiencing Space as Euclidean and infinite; they saw the world as a coherent three-dimensional Euclidean container in which objects and the unfilled spaces between them alike occupied parts of one continuous infinite three-dimensional Euclidean container.[11]

How was it possible for human perceivers who had become accustomed to perceive in hyperbolic geometry, to come to perceive space in a Euclidean way? I surmise that as human living space came more and more under the domination of architects and engineers,[12] people acquired the ability to "read" the geometrical clues present everywhere

10. See Wildiers (1982)
11. See White (1967), and Snyder (1980)
12. See Heelan (1982), chap. 6

in such carpentered environments. Hyperbolic space, though more "natural" to unaided vision, seems nevertheless to have been abandoned as illusory relative to the new cultural interests of Europe which favoured the new, scientifically based, experience of a carpentered Cosmos. The emergence of infinite space as a form of human experience went hand in hand with a new secular naturalism –or naturalistic literalism—in which religious meanings gave way to naturalistic descriptions and depictions. Though divinity was often suggested in paintings of this period through the symbolism of the convergence point of orthogonals, the space itself had no natural centre or natural periphery to represent the twin theological symbols of man and God.

This change in the cultural experience of a people spread rapidly across Europe, and soon began to be reflected both in cosmological theories, and in theology. Copernicus proposed to transfer the centre of the universe to the Sun, the symbol for him of God; the earth was now represented as turning around the Sun, while the Stellatum was removed to a very large but nevertheless finite distance within the general emptiness of the Euclidean Void. The universe of Copernicus, like the medieval one, was finite, with twin poles for God and man, but unlike its predecessor, God's pole was at its centre, and man's pole moved around this centre under the starry canopy; all of this was in a mostly empty infinite container.

The first to face up to the theological implications of the changed character of the human experience of cosmological space was Nicholas of Cusa (1401-1464). Standing on the watershed that separated the Middle Ages from modern times, he experienced two cosmologies, the old or finite and the new or infinite (or, at least, indeterminate); he speculated about the coincidence of opposites, and developed a philosophical system of "complicatio" and "explicatio" that reminds one so much of the philosophies of David Bohm, Fritzhof Capra and Alex Comfort. The stigma of atheism was, however, attached to infinite space since ancient times: to become accessible to Christian Europe, infinite space had to become as much the symbolic home of God as it was already becoming the real home of man. This new cosmological space was without a centre or a periphery to serve as symbols of God and man; space itself, however, was eternal and infinite, and so loaded with religious import: it became the new symbol of the divine. The symbol for man, however, became the sight-point, a dimensionless point, from which an individual mirrored the universe. Man himself,

consequently, came to be reduced to a disembodied spectator Mind, a monad, individuated by the spatial point he occupied. The two symbols, infinity and zero, were mathematical inverses of each other, emphasizing the "distance" between God and man; they also "denatured" man by suggesting the irrelevance of his body for the life of his mind.[13]

The transition to the new symbols was attempted in many ways. Henry More and the Cambridge Platonists, whom Newton by and large followed, took the *sensible or experienced space* of the universe to be in some sense absolute, eternal and immutable; they made it an attribute of God, called "God's Immensity," and through His Immensity, God was thought to exercise His Will within this world. Others, such as Malebranche, *conseptualized Space* as an "intelligible extension," and identified the source and referent of this idea in God. In all of these moves we notice in some degree the typical gnostic refusal to regard the symbol as a text to be read, and instead, it is dogmatized and to it a secret, eternal, sacral reality is attributed. It was left to Baruch Spinoza to take the final gnostic, in this case, pantheistic, step, and to identify intelligible Space with one of the two modes—thought and extension—which in his view constituted the divine substance, *Deus sive Natura*, God, that is, Nature.

We are all aware that despite the fact that Galileo, Descartes, Newton and most of the founding fathers of modern science were great Christian believers, the scientific Enlightenment led to disbelief. Was this because an infinite Cosmos had a radical incapacity to sustain a coherent religious symbolism, something Democritus, Lucretius and many theologians in the Middle Ages took to be the case? I do not think so, I attribute it instead to the rationalism of the Enlightenment. For the Enlightenment, rational knowledge consisted in the possession of clear and distinct concepts, exemplified by the geometrical treatises of Euclid and physical treatises of Archimedes. The Enlightenment thought of itself as soaring above the radically illusory aspects of sensory experience to find truth in clear and distinct, mostly mathe-

13. Koyre (1957) studies this transition as a change in conceptual models of the Cosmos, from a finite closed Universe to an infinite open Universe. He does not, however, address the fact that these cosmological interpretations were apparently perceptual, and therefore given directly and unproblematically to people in their everyday experience.

matical, conceptual models. If the goal of truth is in clear and distinct ideas, then the truth of experience can only be perceived as a less perfect form of knowing, a form rather of appearing. With this orientation, symbols were taken—not as a repertory of surplus meaning —but as impoverished and confused concepts or concept-substitutes, more in need of clarification than interpretation.

Given this new epistemological orientation, a new branch of philosophy, natural theology, was born; this looked for religious knowledge in conceptual analysis and logical (deductive) argument. We find the Enlightenment then preoccupied with the analysis and logic of arguments for the existence of God, from Space, from Number, from Force, from Light, from our ability to conceive, etc. The hermeneutics of religious symbols and religious experience came to be replaced by the logic of proofs for the existence of God. This, I have argued, placed the cart before the horse. We must experience God (believe in God) in order to understand His works (theologically). No mere scientific understanding of His works can serve as premises from which to prove God's existence or derive a theological meaning for scientific entities, since God is not part of any scientific concept, nor is He entailed by any scientific concept. Hermeneutical inquiry implies, paradoxically, that we cannot hope to find God if we have not in some sense already discovered Him.

Incidentally, recent work in the philosophy of science supports the view that an analogous hermeneutical principle applies to science: unless one first understands the hidden structure operating in an experiment, one cannot come to recognize its experimental profiles and thereby come to believe in it, but unless one already believes in the hidden structure, one cannot come to understand how it operates in the experiment. Such an account is the hermeneutical rephrasing of what is usually called the "theory-ladenness" of scientific observations.[14] To summarize: the hermeneutical character of all theoretical knowledge implies that in the case of theological knowledge, a prior commitment is made to God under some primary religious symbol.

We are all aware that the infinite cosmology of Newton and the great era of classical astronomy and physics was destroyed by develop-

14. See Heelan (1982), chap. 13

ments in physics and astrophysics in this century. In physics, the decisive new theories were the special and general theories of relativity, and the quantum theory. There are those who see in relativity and quantum mechanics a new possibility for a return to God; they would argue that the content of the new physics suggests a religious interpretation, or serves as a compelling symbol of a divine—if perhaps, not a Christian—order.

We need to examine such claims bearing in mind the hermeneutical principles already set forth: (1) A religious symbol is something that is experienced as real. (2) A concept or mathematical model cannot serve as a religious symbol, for such models, like those of classical physics and astronomy, if used for theological purposes, logically lead to agnosticism or atheism. (3) The religious symbol (a) has a *phenomenology,* (b) needs to be believed in, and (c) invites thought or theoretical understanding through a hermeneutical process; the outcome of the last is a way of coming to "read" the symbol within the background of one's religious culture, and of getting a religious meaning in terms relevant to that culture. (4) A major form of spurious interpretation is the dogmatizing of the symbol (here called "gnosticism"), that forbids demythologization on the one hand, and theologizing on the other. To dogmatize a symbol is to hold that the physical description of the symbol is somehow sacred, itself secretly divine; such a belief inhibits—would, in fact, forbid—any hermeneutical move that would drive a wedge between the symbolizing fact (the primary intention) and the religious truths it symbolizes (the secondary intention): it would also generate passionate opposition to any change in the physical description of the symbol, which would put in jeopardy its projected religious content. A gnostic relationship between science and religion is then counterproductive for both.

Quantum Mechanics as a Religious Symbol

Quantum mechanics is a theory about nature that for over fifty years has been applied with success to many fields of scientific work. Within the quantum theory is a set of equations, a methematical model that, when properly applied in an empirical situation, makes manifest to human observers the hidden and quite unusual quantum-mechanical structure of the world. Let me consider the mathematical model first, and then examine the world quantum-mechanics shows.

The mathematical model of the quantum theory has the form of an abstract Hilbert space of rays (also called, "wave functions"); what these rays represent in the world is not clear, even after fifty years, there is still no consensus about what they represent. Are they objective dispositions of a physical object that need to be complemented by the choice of a measuring system, or do they describe super-empirical states of the object, not accessible to human observers, but possibly to higher order "demonic" observers?[15] As far as humanly observable events go, quantum mechanics says that these are linked only by probability schedules, that they comprise ranges of complementary properties not all simultaneously observable (except under some principle of indeterminacy), but among which the observer is forced to make a choice. Were it a simple "picture" of physical events, the model would say that pairs of distant events should be able simultaneously to influence one another contrary to the entrenched belief that causal influences cannot travel faster than the speed of light: but is the mathematical model within quantum mechanics a simple "picture" of the world?[16] One thing is certain, that the quantum theory in its present form speaks of physical systems in such a way as to include, or take account of, features belonging to human-experimental observers; for this reason, quantum mechanics violates the old criterion of scientific objectivity, that a scientific account should describe the world independently of human observers, their biases, choices, and mental acts.

Whatever the mathematical model of quantum mechanics is taken to represent, it can certainly be used in experiments to describe that quantum level of empirical reality that shows itself to human observers during the course of these experiments. It is in this capacity of the quantum theory to show us a quantum mechanical world that would make possible its functioning as a religious symbol. It would have this possibility, of course, only for those who succeed in experiencing the world according to the quantum theory. At first sight, this restricts its potential religious function to practising scientists, familiar with the setting up of experiments or using the technology through which the world comes to show itself as quantum mechanical. Unless there exist

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15. The term was coined by Alex Comfort, but the view of quantum mechanics expressed is common to David Bohm, John Wheeler, Hugh Everett, and others; see d'Espagnat (1971).

16. See, for example, the account given in d'Espagnat (1971).

technologies that are capable of showing the general public the quantum mechanical character of the world, people will have to rely on the witness of religiously oriented quantum physicists who also understand the basic rules of hermeneutical inquiry, and there are few indeed who understand these rules.

Fortunately, there exist technologies that show us the quantum mechanical character of the world: chemical bonding is quantum mechanical, spectra formation through incandescence, the principles of the colour TV tube, programmable microcomputer memories, laser light, the radiance of the sun, and last but not least, the nuclear bomb; surely if anything has outstanding religious import, it is our capacity to harness nuclear forces through their quantum mechanical character to manufacture such an instrument of total, global and civilizational destruction. The possession of such a power cannot fail to give our society something like a religious sense of original sin.

However, those who use quantum mechanics as a religious symbol—usually physicists—focus on aspects of the quantum mechanical account that are not illustrated in these examples. Such are the non-Cartesian aspects of quantum mechanics, for example, the role of the observer in quantum mechanics and the observer's role in shaping the space of what is or could be observed, the failure of causal and local laws, etc.

Fritzhof Capra, David Bohm and Alex Comfort[17] to mention a few, attribute special significance to the non-Cartesian aspects of quantum mechanics: a free quantum mechanical system cannot be thought of as having definite properties independently of how it is observed; it is not at a definite place, not bounded by definite closed contours, does not act outside of itself in an observer-independent way. A quantum mechanical system becomes an empirical object for a particular kind of observer by a sort of "mitosis" of the state represented by the wave function; during this, a subject-object "cut" or duality emerges that changes the negentropy or information content of the original state. The properties of the object which, then, become empirically manifest are to some extent a function of the empirical subject embodied in instrumentation, and the schedule of their objective realization becomes a matter of statistics. It is in some way such as this that Capra, Bohm, and others would describe the originality of quantum mecha-

17. See, for example, Bohm (1980), Capra (1977), and Comfort (1979).

nics. Note, that in this account experience or observation occurs only when there is a specific empirical subject, that is, when the subject-object division has happened. Bohm calls the state antecedent to observation, the enfolding of the "implicative order", it connotes the multiple potentiality for subject-object division, and for corresponding cognitive picturing acts on the part of different empirical subjects. Bohm, Capra, and Comfort take the quantum theory to describe reality from a platform higher than the potential divisions between the empirical subject and empirical objects. It would have this possibility, of course, only if reality so described is non-empirical, or that the subject that makes knowledge claims about such a reality is not the empirical human subject, or at least not one operating in any ordinary cognitive mode. In the former case, the first and second of the hermeneutical principles set forth above are violated: a symbol must be an experiential item, not just a concept or mathematical model. In the latter case, I would demur from presuming that we are forced at this stage to postulate that the reality behind quantum mechanics is given only through a special form of mystical knowledge, as Capra and Comfort claim.

Moreover, the conceptual model used by these authors is, I claim, more the construction of a certain metaphysical fantasy of a higher but ironically Cartesian sort, than an attempt, as they also claim, to understand the relationship between human objectivity and human subjectivity. Pure human objectivity is a myth, so also is pure human subjectivity, on that we agree; but this admission does not imply that whatever is, is an indeterminate co-mingling of subjectivity and objectivity; for whatever is, insofar as it can be experienced and described is an object of human knowledge, and to it corresponds a human subject who is or could be in possession of this knowledge. All objects of human knowledge are contextualized by the human knowing subject; they imply a language system, and a set of contextual conditions for its use; what quantum mechanics says in addition is that as far as knowledge of empirical objects is concerned, the contextualization we establish is always an embodied one, involving bodily, including technological, interaction with the object. Empirical subjects are *materially* as well as *spiritually* (or *intentionally*) involved with real objects—and that essentially. Quantum mechanics is the first physical theory to discover and take account of the fact that we only experience things in context, that contexts are physical (and may include techno-

logical instruments), and that things show themselves to us only as functions of the variety of possible experimental contexts.

Quantum mechanics implies that the empirical subject must then be identified with the variety of experimental contexts within which a scientist can come to experience objects. It implies that knowledge is not a Cartesian mirroring, but a hermeneutic of those physical channels of information stimulated by physical contact with the object. The most significant feature of quantum mechanics is the discovery that different information channels (those for complementary variables) can interfere with one another. Consequently, an individual's choice to set up a particular channel changes the empirical subject by adding the embodiment of the experimental context chosen for this measurement; it also changes the empirical object, because it chooses among the (complementary) descriptive properties under which the object could have manifested itself, sometimes destroying information in the process.[18]

Quantum mechanics then refers to the variety of possible contexts of experience; as all the commentators point out, it also includes reference to the inter-connectedness of this variety in a super-contextual way. This reference, however, is non-empirical, it is logical. In quantum mechanics, one is dealing with essentially multi-contextual discourse in which the choice of context made by the subject can lead to loss of empirical information; some contexts maximize the available empirical information (for example, those for which the wave function is an eigen function), all others destroy some information. What is the case in nature is then creatively affected by free human action in the World: this is not just the consequence of immaterial acts of consciousness, as many commentators claim, but it is a consequence of the sort of planned human action needed to hard-wire the human subject to the object of quantum mechanical inquiry. Quantum mechanics, however, does not describe how a quantum mechanical world would show itself to a hypothetical super-contextual observer, for we know of no such observer, and we know of no observational super-context of all contexts. At the supercontextual level of conceptual analysis, quantum mechanics speaks logic, not fact; the logic in question is a form of non-classical

18. See, for example, the Appendix in Heelan (1965) for an account of the potential destruction of information by an observation; see also Heelan (1982) chap. 11.

logic (falling into the category of "quantum logics") which deal basically with contextual inter-relationships; it does not describe quantum mechanical systems, only some of the logical conditions that possible descriptions must obey.[19]

Bohm and Capra are ironically higher level Cartesians; they still want to posit an uninvolved spectator Mind that surveys in one comprehensive glance the total inter-contextual enfolding of the "implicative order" (to use Bohm's term). Such a knowledge could not be an experiencing, and such a Mind could not be a human mind, at least not one functioning normally. Capra appeals to a special mystical functioning of a human mind. I would admit that there exist mystical states of the human mind in which a divine influence touches the human mind directly, but I do not see how such a touch is explained by quantum mechanics, or how the specific features of a quantum mechanical world could provide the experiential basis for or explanation of such a symbol. As I have said, the super-contextual view of quantum mechanics is a logic of possible subject-object material-contextual-intentional relationships, not an experiential object capable of being a divine symbol.

There are other views about the theological implications of quantum mechanics: one would postulate a divine consciousness separate from the universe but pervading it as the agent of the "reduction of the wave packet" (this is the technical term for the observer-related features of quantum mechanical measurement); another would claim divinity for the universe itself, that it is, in Spinoza's terms, *Deus sive Natura*.[20] According to the hermeneutical principles I set forth above, all of these moves would be of a gnostic character. Finally, given the anti-Cartesian polemic of these authors, such moves imply a theory of knowledge that is ironically Cartesian in inspiration.

A similar theological move has been made with respect to relativity. The special theory of relativity states that all Space-Times are functions of moving observers; and that no single privileged objective Space-Time exists. The special theory of relativity is, however, more classical than quantum mechanics; the choice of a framework for

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19. For the view that quantum logic is a logic of context-dependent-discourse, see Heelan (1970)
20. See the *Ethics* of Baruch Spinoza

observation does not ever reduce the information content in nature. Unlike the human subject in quantum mechanics, the human subject in the special theory of relativity is not a creative partner with nature in determining what information it contains. However, since there is no single privileged objective Space-Time, Capra and others claim that objectivity must be sought on a higher plane from which a commanding view can be obtained of all possible Space-Time frameworks; such a super-contextual perspective is not, however, one from which a more comprehensive reality can be experienced by human knowers functioning normally. Theologically oriented physicists such as Capra, have associated with this super-contextual standpoint a special mystical form of human knowing. Note that the search for this commanding view repeats the search for Cartesian objectivity but from a super Space-Time perspective. Others have found, particularly in general relativity, reason to assert the identity of nature with the divine substance. The last mentioned was the position taken by Einstein.[21]

Finally, let me consider the following three questions: (a) Could nature or the Cosmos as described by modern science, function as a primary religious symbol? (b) How would such a symbol relate to interpretation? (c) Would it be a source of new knowledge about God, or would it merely re-assert an old knowledge?

(a) The first question: do we—or do some of us—reach God through an experience of nature grounded in modern science, particularly in physics, cosmology or astrophysics? The answer is Yes! There is a considerable literature written by astronomers, nuclear physicists, biochemists, cosmologists, geneticists, and others witnessing to the sense of religious mystery and worshipful awe experienced by these researchers in the course of their scientific work.[22] Pre-eminently among these are A.N. Whitehead[23] and Pierre Teilhard de Chardin.[24] While neither the work of Whitehead nor of Teilhard are deeply affected by gnosticism, much contemporary speculation is unfortunately

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21. Einstein (1973), p. 47

22. To mention a few: H. Bergson, T. Dobzansky, A. Eddington, A. Einstein, P. Lemaitre, E. Mascall, A.R. Peacocke, M. Polanyi, E. Whittaker.

23. See, for example, Whitehead (1948); for an important work in this tradition, see Neville (1980)

24. See, for example, Teilhard (1965); for a commentary on Teilhard's work, see Smulders (1967).

so affected. It is, however, sometimes difficult to distinguish between those scientists or theologians who adopt a sacramental attitude towards nature (nature as a religious symbol), such as A. R. Peacocke[25] and Teilhard, and others such as Einstein, G. A. Riggan and R.W. Burhoe[26] who seem to be saying something more, that the invariants of its evolution or unfolding are in fact divine.[27]

(b) Is the choice or discovery of a genuine religious symbol dependent on the religious tradition one already belongs to, and so on earlier forms of religious experience one has encountered?

I presume that it is in fact the case, that a person brings to the understanding of a new religious situation, the paradigm religious symbols and theological theories he or she already believes in. This is a first principle of the hermeneutical circle of inquiry. There is, of course, the possibility of radical conversion, from atheism to theism (or *vice versa*) or from one form of paradigmatic religious experience to one of a radically different kind, but barring this, it is clear that what one makes of the possibility of religious symbolism in modern physics, is a function of one's past and present religious life and theological understanding.

For some, the paradigmatic religious experience is that of an "oceanic feeling." It is said that such a feeling is objectless, that it transcends empirical subjectivity and empirical objectivity. How it is understood by those who use this term can only be inferred from the way religious writers, or writers about religion, speak about it: it is experienced as joyful, but featureless, it is ecstatic (out of self and world), it carries the assurance of the protection of a heavenly father, and so on. That it can for some be related to modern physics is significant, but mysterious, at least to me. Is the reason for introducing modern physics, the thought that modern physics may turn out to offer a scientific explanation or a scientific reduction (in the usual causal or logical senses of these terms) of the oceanic feeling? Or is the intention to offer instead a scientific hermeneutic of that feeling (a "reading" of the feeling-as-symbol in scientific terms)? In either case, one has little reason to *conclude* that the feeling is divine: one

25. Peacocke (1977), and (1981)

26. See, for example, Burhoe (1973), pp. 419-420, and Riggan (1973), p. 474.

27. Einstein (1973), pp. 47, 50, 57, 61.

must then assume this from the start, or assume that nature and self are themselves divine, the antecedent approach to this question is from the hermeneutical point of view pantheistic.

Comfort, Capra, and others take the oceanic feeling to be a subjective state (a state of the subject), and associate this experience with a certain view about the dissolution of the subject-object "cut" in quantum mechanics. This association has more an explanatory than a hermeneutical function. Their conclusion, nevertheless, is one of subjective idealism or mystical pantheism. For myself, I believe that the understanding of quantum mechanics on which it is based is wrong; and that the truth they describe about the religious experience is relatively independent of the scientific metaphor, were it not dogmatized as a form of gnosis.

Again, unitary cosmological field theories stress the impersonal relatedness of all to all; such have been chosen to explain or express a different form of oceanic feeling, that which is experienced as impersonal and objective. For scientists who possess such an experience, general relativistic cosmologies serve a similar function to that served by quantum mechanics for those who interpret their oceanic feeling subjectively. Pre-eminent among those whose religious experience was of the impersonal and objective kind was Einstein;[27] he, consequently, took general relativistic cosmology to lend support to an objective pantheistic idealism like that of Spinoza in which a perfect rational idea of Nature—*Natura naturans*—controls *more geometrico* the Nature —*Natura naturata*—of which it is the idea. The gnostic element in Einstein's religious position seems, moreover, to have influenced his physics; for example, he held quantum mechanics to be an incomplete theory, and therefore only provisional, because of the unpredictable role the observer plays in its picture of the world, such an account could not be true, as he said, because "God does not play dice!"[28]

Again, if one's attitude is moulded by a mystical Christian spirituality of a sacramental sort (in which the events of nature and history are experienced as loaded with religious significance), then it would not be implausible to look for a christological and trinitarian meaning

28. Einstein (1979), p. 68 with the reference to God not playing dice in quantum mechanics; also see Einstein (1973), p. 61, for reference to Spinoza.

in geological, evolutionary and world history, such as Pierre Teilhard de Chardin developed.[29]

(c) Is the finding of an appropriate cosmological symbol within one's religious tradition capable of conveying *new* theological knowledge ?

This question has already been answered affirmatively: a genuine symbol comes before articulated knowledge, and is the source by hermeneutical reflection of new knowledge. The evolutionary character of our cosmology, particularly as evidenced in geology and biology, has changed theological knowledge for mainstream Christians. It has also affected Fundamentalists, since their deliberate and reasoned rejection of evolutionary theory is a potent precedent for them that will affect future decisions: whether the decision was a good one for them will be much debated.

I wish to end with some Christian theological reflections stemming from the special Space-Time character of modern physics. The inescapably physical character of the contextuality of human experience as borne out particularly by quantum physics leads to the conclusions that human experiential knowledge is normally bound to the material conditions of nature, and that what is known or knowable is a function of human creative and material initiatives in building varieties of physical contexts for experiential knowledge. As a human perceptual knower, one can only know a part of nature, and that as a function of the part of nature which one presently embodies. The most significant conclusion, however, is that there is no ordinary experiential context of all contexts, consequently, we cannot ordinarily know either the Cosmos or God directly, as a direct object.[30] Instead, we have to rely on mediating images, symbols and metaphors for both. If, however, these were merely of our own choosing, we would not be able to tell an authentic religious experience from a fantasy, a delusion, wishful thinking, or an infantile regression. Consequently, I argue, the images, symbols and metaphors must contain an element of divine initiative. We may speak of possible and appropriate channels, but which are actually alive, how an alive channel serves to carry an

29. See note 24 above
30. See Heelan (1977)

authentic message, must involve mutual initiatives and responses from both the human and the divine.

The history of religions tells us about some of the channels that have come alive as religious symbols: there have been, for example, prophetic human persons who served as symbolic mediators, persons to whom God communicated such an excess of wisdom and power that they "show" the face of God; people have read the lives of these prophets, *homoiousioi* (or having an essential likeness) with God, as living and speaking metaphors of God.[31] In the interpretation of prophetic personalities, gnostic-type errors are possible in which the symbol is identified in some way with the symbolized.

Divine incarnations have been claimed by some religions; these are prophets of a special kind of whom divinity is predicated in an essential way. Christians, for example, worship Jesus Christ as such an incarnation of God in human form, holding him to be both Man and God. The Council of Nicea (325 a.d.) declared Jesus to be the second person of the Trinity, and—using a philosophical terminology —*homoiousious* (or consubstantial) with God: according to that council, Father, Son, and Holy Spirit are three "Persons" who share the same identical monotheistic nature, they are not then three Gods. The trinitarian character of the Christian God emerges by a kind of transcendental deduction from the context of our discussion. Assuming that all public knowledge of a religious sort is tied to religious symbols, in order for the symbol to come alive, three things are needed: (1) an authentic religious symbol, (2) the power to read that symbol as a text about God, and (3) a form under which God is capable of being revealed to human beings through this symbol. These refer respectively, (1) to Jesus Christ as the second person of the Trinity—the image, (2) to the Holy Spirit as the third person of the Trinity who gives this power, and (3) to the Father as the first person of the Trinity —God-as-revealed through Jesus.

Jesus is such a religious symbol, "he is the image of the unseen God," as St Paul says in a passage that continues by connecting him with the Cosmos, "in him were created all things in heaven and earth, visible and invisible" (Col. 1/14-16). Jesus then is the image of the unseen God, and God so revealed is the Father. In the passage just quoted, Paul says that in some sense the Cosmos is also an image of the unseen God, since it was created "in" Jesus—I take this "in" to

mean a relation between the Cosmos and the unseen God not unlike that between Jesus and the Father, that is, one is a symbol of the other, In the gospel of St John, it is reported that Philip, the apostle, asked Jesus, "Lord, let us see the Father", to which Jesus replied, "To have seen me is to have seen the Father" (Jn. 14/8, 19). Then Jesus promised his disciples to send them "another Advocate", the "Holy Spirit," to be with them forever, who will teach them how to see the Father in himself (Jn. 14/16, 26). The earliest tradition then recognized that a Christian cannot see Jesus as the image of the Father without the help of a special power communicated by the Holy Spirit. This special gift of the Holy Spirit is the hermeneutical ability to interpret religious symbols; principally, of course, the Christian ones, but derivatively the cosmological ones.

It would not stretch the Christian tradition excessively to say that the gift of the Holy Spirit offered to Christians extends also to the recognition and interpretation of cosmological religious symbols, perhaps even scientific cosmological symbols. The traditional concern of Christian thinkers, from Augustine to Whitehead and Teilhard de Chardin, about a possible *religious* meaning for Space, Time and cosmology is something rooted in the presuppositions of Christian beliefs. It is also shown to be in keeping with the embodied and essentially contextual-intentional character of human knowledge exemplified in modern physical theory, and in the hermeneutical functioning of religious symbolism.

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