FROM GOD TO INFINITY, OR HOW SCIENCE RAIDED RELIGION'S PATENT ON MYSTERY

by Carl Raschke

Abstract. The efforts of theologians in the last few decades to adapt their discipline to the methodological constraints of the "empirical sciences" have become obsolete. Just as many theologians have reached a tentative rapproachment with the "secular" mentality, the elements of mystery hitherto shepherded by religious thinkers have been appropriated in the cosmological models of the "new physics."

The paper explores revolutionary developments over the last ten years within quantum physics. It points to an imminent convergence between scientific and religious concepts within a larger framework of speculation termed *synholism* (from Friedrich von Weizsächer), and examines theoretical implications of such hypotheses in high-energy physics as a "cosmic consciousness" and "multiple universes."

> Humankind is on the threshhold of the incredible.
> Michael Talbot[1]

Nowadays one is apt to react to the latest *apologia* for the vocation of contemporary theology and its ministrations to "secular man" with an unchecked yawn. While the churches by and large have become the chattels of middle-class mediocrity, many academic theologians in the last twenty years have anointed themselves collectively as presbyters for the "modern" outlook toward religious matters. This regularly invoked "modern" world picture, with which theology tirelessly labors to align its sights, has been compiled and digested from out of the welter of tacit assumptions, specific data, and broad hypotheticals given currency by the notoriety of the physical and behavioral sciences, notwithstanding the philosophy of science itself. Religious thought has been obsessed with its own legitimacy in this climate of

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[*Zygon*, vol. 17, no. 3 (September 1982).]
 0044-5614/82/1703-0002$01.65

opinion, and one of its ritual gestures has been to concoct ways in which it can describe its criteria, operative suppositions, and methods as "empirical," regardless of whether that adjective might connote a concern with present varieties of "religious," mundane, and historical experience or with some updated species of "natural theology."[2] In any event, theology's passion to please the magisterium of the so-called empirical sciences has driven it to scant all indications of the wholly other, the miraculous, and the mysterious, which in a bygone age was the very basis of its livelihood. Aside from the tangled issue of whether in making these accommodations theology has become useless, it is still fair to say that humankind's perennial appetite for transcendance is now being slaked by other vendors. We need not survey the explosion of popular interest in mysticism, psychic oddities, the occult and UFOs, not to mention the traffic in science fiction and space fantasies. For the "stone" which the builders of the modern temple of reason once rejected has been reclaimed not by the defrocked clergy but by the scions of the master craftsmen themselves—namely, the physicists.[3]

Physics from Descartes to Einstein

The common canard is that the advent of mechanistic physics in the seventeenth century, fathered by René Descartes but worked out with theoretical precision by Johannes Kepler, Galileo Galilei, and Sir Isaac Newton, marks the starting point for a progressive "disenchantment" of the universe at the hands of modern science. According to this time-honored account, the Cartesian advocacy of a *mathesis universalis*—a formal, reduplicable, and rationally consistent language of nature—merged with the Baconian enterprise of empirical investigation to yield the renowned "scientific method" that fatefully undermined theological speculation and set man's religious sensibility on edge. While it is true that the transition from the hierarchical and organic cosmology of the Middle Ages to the mechanistic paradigm of the industrial era did contribute to a weakening of traditional religious convictions, it remains far from certain that modern science in the technical sense of the word can be held wholly responsible for this disenchantment on a mass scale. It may be more appropriate to contend that the democratic idolatry of technological achievements, coupled with a superstitious reading of the materialistic hypothesis in a century of worldly abundance, has been just as much a factor in the retreat of religion. With the exception of some nineteenth-century thinkers, most of the great minds and trailblazers in modern science have either subscribed in some guise to the "God hypothesis" or have been imbued, like Albert Einstein, with the marvel of creation. It can be observed that even on university faculties today the greatest sym-

pathy for the religious point of view is to be found among mathematicians, physicists, and other yeomen of the "hard" sciences, whereas often the deepest resistance and hostility stems from among biologists and sundry social scientists who feel compelled to prove, like an *arriviste* among gentry, the pedigrees and protocols of their discipline.

Nevertheless, an historical irony crops up in the fact that just as seventeenth-century mechanism triumphed at the turn of the century, in its campaign to capture the *Zeitgeist* of Western civilization, the Newtonian world design began to unravel. If Friedrich Nietzsche's madman would soon discomfit theologians with the rumor that God was dead, Einstein and his cronies were poised to shock the scientific community with the notion that the great cosmic watch had popped its mainspring. It would be both fruitless and redundant to detail once more the "revolutionary" facets of Einstein's theory of relativity. Let it suffice to mention that Einstein did for physics the same sort of service performed by Immanuel Kant for the ideology of the Enlightenment philosophies. Kant did not reject straightaway the phenomenalist dicta of David Hume, who collapsed objective knowledge into sensation. Nor did he brush aside entirely, as cursory readers of the history of philosophy are wont to presume, the agenda of metaphysics. Rather Kant simply defined the limits or horizon beyond which both empirical inquiry and *a priori* deductive generalizations proved inappropriate. In that respect Einstein as well as Kant acted as boundary surveyors for what had hitherto been open and expansive terrain. Einstein literally put the Newtonian laws of motion "in their place."

But Einstein, in contrast to Kant, was also an explorer and reported prodigiously on what had formerly been the physicists' *terra incognita*. In the recognizable, common sense world where space and time can be represented as a matrix of forces acting predictably upon moving bodies, mechanistic explanations remain elegantly correct. Yet in the vaster, sidereal range, where magnitudes, especially of velocity and distance, are enormous, such descriptions must be revised if not purged. As a particle approaches the speed of light its mass increases and time slows down; within the gravitational fields of mammoth stars, not only are light paths bent but space-time itself is warped. Einstein's approach resembled that of the French painter Paul Cézanne, who laid the foundations for the modernist esthetic. Just as Cézanne attempted to draw what the eye genuinely "sees" in place of the idealized image which traditional art had mistaken for the field of vision, so Einstein endeavored to delineate, mathematically as well as metaphorically, the topography of the perceptible universe and not a heuristic abstraction. Furthermore, both Cézanne and Einstein recognized the fluid interface between subject and object, between

phenomenon and observer.[4] As Nigel Calder comments, "the chief merit of the name 'relativity' is in reminding us that a scientist is unavoidably a participant in the system he is studying."[5]

But this factor of "participant relativity" was to be applied far beyond Einstein's denial of absolute time and space, together with his correlation of measurement not to some new, apodictic standard but to variable "intertial frames." Einstein himself succeeded mainly in widening the scope of astrophysics; he solved many of the enigmas of the macrocosm by bending the great canvas at its fringes. Yet he did not make such a radical departure from mechanism as posterity has come to believe. His celebrated epigram, *Herr Gott nicht würfelt* ("God does not play dice"), testified to his dogged view that Newton's "clockwork universe" was still an infallible timepiece. One might say that Einstein merely looked upon the contrivance as much more sophisticated and complex. Even his formula of $E = mc^2$ simply states the equivalence of mass and energy without altering their conceptual value. With respect to religion, Einstein's suggestion of a remote, cosmic mastermind served to provide a new scientific grounding for old-fashioned theism, which had fallen from fashion in the epoch of Raymond Poincaré and Ernst Mach. Relativity theory left untouched many of the modern assumptions about the material makeup of things, and it thereby did little to further any rapproachment between science and the spiritual. The drift from positivism to mysticism in twentieth-century physics was to be spurred chiefly not by the man who made us gawk toward the most distant constellations but by Einstein's amiable adversary who beckoned our gaze toward the interior riddle of matter itself.

Principle Ideas of Quantum Physics

The helmsman who engineered this change of course for the ship of science was Niels Bohr, the Danish physicist who is best known for building what is now a textbook mockup for the atom. But such a mockup could only have been construed on the basis of a radical new understanding of the material "substratum" of things, which Bohr helped establish and which rapidly evolved as the so-called quantum theory. The effect of quantum theory on our conception of the microuniverse is comparable to the impact of relativity on our grasp of celestial processes. But quantum physics proved to be an even more devastating blow to mechanism than relativity equations could muster, for the quantum principle turned on a fundamental paradox which not only Newtonian thought but the omnibus tradition of Western metaphysics and science could not incorporate: a uniform coherence of natural events deriving from their essential *incoherence* within specific domains of action. Another phrase to characterize this

view is "broken symmetry." First, quantum theory holds that with macrounits of organization there are stable, congruent, and symmetrical relationships which lend the *appearance* of permanent entities, such as molecules and crystals; yet at the microlevel these seemingly "solid" structures disappear and what shows itself to be "real" are simply a phantasmagoria of patterns. If one asks the question, "patterns of what?", the answer can only be "no-thing," for the substratum of the world is not a thing at all. These patterns are, in effect, vibrations of some unknowable x that manifests itself in space-time as matter and energy. Hence, quantum physics has brought about what Gary Zukav has dubbed the "dematerialization of matter" and has conformed to the postulate that "*physical reality is essentially non-substantial.*"[6] The fluctuations in this non-substantial reality are neither invariant, like orbital motion in Newtonian mechanics, nor subject to flawless predictions. Their consistency from an average, observational standpoint is due to a certain statistical probability and not any "lawful" regularity. God *does* play dice, and everything that exists is determined by a certain throw.

Second, quantum thinking maintains that the links between modes, or more precisely, "phases" of physical reality are not extensive but are *discontinuous*. For example, when the element sodium is gasified, what takes place is not an unbroken transition from one material state to another. Until quite recently chemistry textbooks would describe atomic phase changes in terms of an electron "leaping" from one energy level to another; but an electron itself is not a corpuscle but a band of vibrational rates. Thus the familiar "quantum jump" is merely a stochastic shift in wave frequencies, and, since each atomic moment has its characteristic vibrational pattern, the change is "discontinuous." The singularity of an element, or its phase, is strictly an empirical construct inspired, as Victor Weisskopf points out, by the fact that atomic wave-patterns "are always the same and are determined by the way the waves are confined."[7] To put the matter philosophically, the "identity" of a thing is composed of the sum of its differences, and these differences can never be mediated or reconciled in actuality. Even though his own metaphysics was still wrapped up with the classical notion of an "extensive continuum," Alfred North Whitehead had a glint of this insight when he noted that "continuity concerns what is potential; whereas actuality is incurably atomic."[8] Interestingly, one historian of science has traced Bohr's insistence that reality is inherently discontinuous to the latter's reading of Sören Kierkegaard, a fellow Dane.[9] But it would be more trenchant to remark that physics had finally seen the point of Zeno's paradox.

The third, and most telling feature of quantum theory was the premise, publicized by Werner Heisenberg, that in the subatomic set-

ting we can never "know" anything directly, because the strategy of observation always modifies the properties of the phenomenon. Bohr himself underscored this thesis in 1949 when he cited the "impossibility of any sharp separation between the behaviour of atomic objects and the interaction with the measuring instruments which serve to define the conditions under which the phenomenon can appear."[10] According to David Bohm the reason for this "eclipse" of the experimental subject "is basically the indivisibility of the quantum of action, which implies that when we observe something very precisely at the atomic level, it is found that there must be an irreducible disturbance of the observed system by the quanta need for such an observation." In addition, Bohm asserts that "on the large-scale level the effects of these quanta can be neglected"; yet within the inner windings of matter they rear up like some menacing serpent.[11]

One illustration of the quantum of action concerns the situation in which an all-powerful microscope might be devised to make visible electrons. The energy of the light necessary to bring the electron to view would inevitably change the quantum state, and thus the "particle" the experimenter saw would be different from what existed prior to observation. A more esoteric, yet increasingly accepted idea among quantum physicists is that "consciousness" itself configures the experimental target.[12] Consciousness, however, is not so much an activity as it is the ultimate reality, the ineffable substratum discussed by Zukav, out of which "matter" as well as "thought" constructs are carved. Thus what we call "knowledge" *per se* does not correspond to some interaction between knower and known, because neither the "subject" nor the "object" of cognition are autonomously constituted within the domain of knowing. They are correlative and fugitive ripples within the interaction itself; they are incident to each other as polarities, as "peaks" and "troughs" within the vibratory field of consciousness.

Ultimate Reality as "Consciousness"

If ultimate reality is nought but consciousness, then no single concept, system of concepts, or even a given "rational" method for manufacturing and testing those concepts can be considered axiomatic, fundamental, or pivotal. For a "concept" is that which, for whatever purpose, binds and limits, or tracks along a specific vibrational pattern within the plenum of existence. As Friedrich von Weizsächer declares: "The genuinely real is what cannot be thought conceptually. . . . Physics is possible only against a background of negative theology."[13] This "background" of negative theology is, of course, the sense of the infinite, shared by mystics and visionaries for millennia, that becomes

the bright corona surrounding all determinate reflection. It harks back to Anaximander's *apeiron* (literally "the boundless") which he held to be the supreme stuff of nature, in contrast with many of his pre-Socratic congeners who tried to conceptualize the Absolute in a definite manner. Both modern theology and science in their preoccupation with securing a proper method or foundation for their probes have finitized, and thereby falsified, their own subject matter, which at bottom must remain in Martin Heidegger's phrase "unthought."[14] The "real," as the etymology of the Latin *res* implies (i.e., what is "fenced off" as "property"), must be bounded. Otherwise, usable knowledge would prove impossible. Yet what is bounded as a concept must be thought unstintingly within the field of the boundless. Even "God" as a theological idea cannot be reduced to the "substantial." That has been the linchpin of all criticisms of the ontological argument for God's existence. God must be relativized, not in connection with the "world," as process philosophy undertakes to show, but within the ambit of infinity, the Abyss, the Void, the Tao, the nameless.

To call this infinite *situs* of things "consciousness," as some quantum physicists do, is not to segment it. For "consciousness" does not eminently refer to a circumscribed region of reality, even though our modern psychologistic tendencies have urged us toward confusing the word with individual self-consciousness and placing it in opposition with "nature." The original meaning of the term "conscious" implies something like "apprehension of the whole." Consciousness therefore manifests the totality of things, or we might even be so daring as to regard it as the self-manifestation, which suggests the ancient Vedantic myth of the cosmos as the "veil of Brahman." In the estimate of Fritjof Capra, both Eastern mysticism and the new physics are rooted in a profound "awareness of the unity and mutual interrelation of all things and events, the experience of all phenomena in the world as manifestations of a basic oneness."[15] Furthermore, "quantum theory forces us to see the universe not as a collection of physical projects, but rather as a complicated web of relations between the various parts of a unified whole."[16]

The "unified whole," strangely enough, is not matter or energy, which consist only in resonances with specific, quantum values within the infinite field of action. It is consciousness as a whole, which undulates like so many waves on a vast ocean to produce the "illusion" of individual objects or events. In the Western ledger of speculation this notion of consciousness as the primordial principle of both genesis and motion was anticipated by the ancient Greek thinker Anaxagoras, who attributed everything that exists, past and present, to the activity of "Mind" or *nous*. "Mind" or *nous*, according to Anaxagoras, "exists

perpetually . . . [and] is surely to be found in the surrounding mass, where other things exist, both in the things that have already been individuated and in those that are in the process of becoming so."[17] In short, the universe is not the artifact of a remote and transcendent Intelligence, as traditional theism has demanded, but is the very body or garment of an omnipresent and indwelling "mindstuff." The phenomenal manifestations of this mindstuff are what we otherwise know as subatomic particles, atomic nuclei, molecular lattices, microorganisms, plants, animals, human beings, planets, stars, quasars, and galaxies. Our integrated and evolving "knowledge" of the natural realm is but a contingent set of coordinates within the gridwork of space-time for locating some dimension of *nous* in its infinite expanse. Hence, the career of the universe is the self-unfolding of consciousness at different levels of manifestation. Our familiar space-time continuum comprises but one "code" or "program" for processing the input from the ultimate source of information, as David Finkelstein has imaginatively proposed.[18] The universe thus can be represented as one cosmic computer, or as a gigantic brain in which all the "neurons" gradually join up with each other and fire in phase.

This broader perspective, which we may dub as *synholism*, combines the quantum rule of discontinuity between singular phenomena with the intuition of an ultimate unity. The differences between quantum "states" or events are inscribed within the geometry of space-time; on a higher plateau they cease to have any relevance. Citing ancient Indian metaphysics, we might conclude that there are two different faces of the one, pervasive divine reality—*Brahman saguna* ("the divine with qualities") and *Brahman nirguna* ("the divine without qualities"). The qualitative differentiation between cosmic processes, which square with the models, mathematical symbols, and explanatory concepts of empirical science, as well as with common-sense inferences, amounts to an ongoing and endlessly rich activity in which, as William Arkle contends, there are opened myriad "channels of communication" for "the divine self."[19] Whether these circuits of information throughout the space-time fabric can be appraised as part of a fugitive and undirected "play" (*lila*) of the divine, as Eastern thinking insists, or whether they comprise a purposeful nexus which Western theology vaguely scents as "Providence," can probably never be decided by science. But undoubtedly the upshot of the synholistic standpoint is that everything within space-time must be ontologically, if not cosmologically, bound up in some fashion with everything else. Just as all points on the surface of a sphere can be plotted on radii projected from the center, so all "figurations" in space-time can be reckoned as outpourings from the universal source and origin.

Contemporary Physics and Cosmic Interconnectedness

Surprisingly, this idea of a universal source and origin was first made respectable in contemporary physics by abstruse mathematical reasoning. In 1964 nuclear physicist J. S. Bell demonstrated that all the "separate parts of the universe are connected in an intimate and immediate way."[20] This hypothesis was the leading implication of what has come to be known as "Bell's theorem," or elsewhere as the principle of "quantum interconnectedness." The paradigm of the infinite interconnectedness of things, not within any physical continuum, but on a transcendental stage behind the curtain of space and time, has been elaborated during the past ten years in such esoteric ideas as "hadrons," the "S-matrix," and "wormholes in the quantum foam." The third, quite colorful notion has been advanced by the physicist John Wheeler. Wheeler has argued that the material world with its observable variations should be likened to a surging sea or "foam" in which countless bubbles or "singularities" spring up, disrupting the alleged continuity yet providing points of exit and entrance for "tunnels" beneath the surface of time and space.[21] These tunnels or "wormholes" are the shortcuts between the different precincts of the universe.

The scenario that emerges here is not just one of a rumpled and permeable space-time membrane through which human cognition, once set at the proper vibrational rhythm, can pass. For Wheeler and others, these transcendent or superluminary (i.e., "faster than light") links among phenomena in the quantum field constitute the feedback loops for the self-programmed development of a cosmic superconsciousness, encompassing all "worlds" and strands of reality. In this sphere messages or "signals," Jack Sarfatti tells us, "move through the constantly appearing and disappearing (virtual) wormhole connections, providing instant communication between all parts of space."[22] These communications are not filtered through some entropic system for organizing "information," which would include even the geometric structure of the visible universe, but statistically have a low probability and can be decoded or received intelligibly only with attention to the universal "hologram" of energy exchanges and interactions. If the "thoughts" of the cosmic superconsciousness could be inspected, they would be neither linear nor "rational" in the conventional sense of the world. If the "intention" of the cosmic superconsciousness, as has been proposed by more wildly speculative physicists, is to maximize "information" about itself through the interplay of mind and matter, and if information is measured as an inverse function of probability or predictability, then the circuits of the intergalactic "brain" cannot be mapped in accordance with either the contours of space-time or

the cumulative comprehension of the "laws of nature." God is not a rigorous thinker; he is an imaginative genius.

More precisely, the universe may be compared with a *divine dream-state*. According to Michael Talbot, "in a dream the division between the consciousness and the reality are arbitrary. I can dream that I and several friends are sitting in chairs and talking. But the division between myself, the chairs, and my dream image friends is only an illusion. All artifacts and entities are subordinate to the consciousness of the dreamer. The dream reality is ultimately omnijective."[23] Our own dreams, feelings, and musings are but flickering clues to the unsurpassed thoughts of the cosmic superconsciousness. Our own individual egos, the sense of "I-ness," are but tiny rays of the cosmic superconsciousness refracted through the prism of space, time, and matter. "Science" itself must become dreamlike; it must proceed, as the philosopher, G. W. F. Hegel grasped over a hundred years ago in his *Phenomenology of Mind*, from the limited and transient data of sense-certainty through the intermediate phrase of self-consciousness to the speculative climax in which the hitherto lone "I" is elevated to that of divine spirit mirroring itself in all concrete particulars.[24] In the infinite dream of self-organizing consciousness, one can say along with the contemporary Argentinian author Jorge Luis Borges that all particulars are

> . . . signs . . . dropped from My eternity.
> Let someone else write the poem, not he who is now its scribe.
> Tomorrow I shall be a great tree in Asia,
> or a tiger among tigers
> preaching My law to the tiger's woods.[25]

The dreamlike "law" of "tigers" is *not* logically inferior to Newton's laws of motion.

The law of tigers, insofar as it makes sense within the synholistic model, may be taken as something like the "acausal connections" (current physicists would speak of "nonlocal causes") between seemingly disparate and remote spatio-temporal events, which C. G. Jung proffered in his theory of "synchronicity," through which he sought to ground the then fledging researches of parapsychology. Jung's theory of "synchronicity" never was elaborated successfully, but the kindred and updated notion of quantum interconnectedness has been invoked recently in diverse quarters to account for paranormal, or what are called "psi," occurrences. Some more conventional theoreticians have proposed the existence of faster-than-light particles called tachyons, which convey "messages" between points in the space-time manifold as part of a "cosmic telephone network."[26]

Yet the notion of superluminal circuits and cross-switches may be nothing more than an intrusion of space-time assumptions about in-

formation transfer into a locale where such metaphors become meaningless. The ghosts of old thought habits always haunt the frontiers of new paradigms. C. T. K. Chari, an Indian physicist, maintains that "the analogy of an electronic communication network" for depicting a "psi" informational system is deficient in one, overriding respect. "The psi-information system extends into the future as well as into the past of the spatio-temporal environment of organisms, which is an anomaly for all current thermodynamic theories of recordable information."[27] In standard cybernetic theory the production, transmission, and processing of information follows "time's arrow," which by extension is keyed to the evolution of matter and energy toward a final state of entropy. "Knowledge" of the future is impossible under the thermodynamic rubric, since time as we know it is the progressive randomization of energy quanta, and future quanta would have a more random scattering than present ones. Moreover, according to information theory, the source of input must have a less random scattering than the domain of output. Hence, "signals" from the future, randomized and sapped of their free energy for the generation of information, would either not be received at all in the present, or they would be picked up as destructive interference or "noise."

The foregoing objection to the presumption of a psi-information system, whether parochial or cosmic in extent, holds up only so far as we confine the "universe" to the region of space-time and thereby are locked into a linear modulus of systems transformation, which is true of the thermodynamic theory of energy and information. It is equally conceivable that the linear modulus is merely one in a larger, holistic complex, and that informational transfer can take place between past and future, not through but outside of space-time. This possibility has already been indicated in Wheeler's "wormhole" hypothesis. Yet such wormholes may not be present at all. Rather than informational quanta whizzing intact like bundles of mail through hydraulic chutes from one space-time singularity to another, they may be "translated" into a timeless and spaceless dimension and assimilated back into this realm. Or we might add that such information is encoded within the "grammar" of the other dimension and decoded again to suit our frame of reference. This process of coding and decoding would account perhaps for the fact that many precognitive sensations or images are often associative rather than mimetic in relation to the actual, future event. The messages from the future become slightly altered or scrambled in transit through an alien information channel, much like the distortion that results in the familiar parlor game of "rumor."

What would be this alternate dimension, or dimensions? Michael Hare has termed it the "z world."[28] The *z* world is *parallel* to our spatio-temporal environs, and at certain junctures (possibly in "worm-

hole" singularities) it is coincident with ours. According to Hare, the *z* world is an archetypal one which imparts the necessary energy of formation to its physical or *ectypal* counterpart. Sticking to the quantum prototype of all "existing" entities as different rates of oscillation for the cosmic superconsciousness, we may infer that Hare's *z* world would have a "higher" vibratory frequency than anything within the ken of ordinary, human awareness. Another likelihood is not that such a "world" is a more energetic string of cosmic pulsations but that it is the "carrier wave" modulated by the experience and action of spatio-temporal entities, just as a radio transmission is nought but a pattern of electromagnetic fluctuations upon which is "imprinted" a sound signal. It is what occultists have obscurely designated as the "astral" place, corresponding to what Robert Monroe more straightforwardly terms the "second state." The "second state," like a photographic plate, receives and crystallizes all the sentient impressions (known to Indian philosophy as the *samskaras*) engendered by entities at the phenomenal level or in the first state according to the maxim, "as you think, so you are."[29] But the second state also influences via "feedback loops" the first state, which can help to explain many "psi" anomalies.

Even these surmises, of course, teeter at the brink of orthodox science. For many physicists there is a more congenial rendering of the "parallel universe" theorem that derives from the accepted principles of quantum mechanics. By this line of reasoning the quantum axiom that the complete physical universe is never certain or determinate, but consists in a texture of statistical probabilities, logically entails the proposition that reality itself is bifurcated. Consider the well-known experiment in which an electron beam is aimed at a pair of slits on a shield. Rather than passing uniformly through one slit, the electrons will alternately "choose" to go through different slits in obedience nonetheless to a rule of statistical distribution. The question arises: what happens each time such a "choice" is made? According to the law of universal symmetry, whenever the electron opts to pass through slit A, its invisible double is passing through slit B in a parallel universe.

The point is made more formally and reconditely by Hugh Everett: "to any arbitrary choice of state for one subsystem there will correspond a *relative* state for the other subsystem, which will generally be dependent on the choice of state for the first subsystem, so that the state of one subsystem is not independent, but correlated to the state of the remaining subsystem."[30] Whenever a momentary decision is made among alternatives in the spatio-temporal world, thereby closing off all but one possible future, the remaining "futures" continue to exist but in a cognate dimension. This hypothesis seems *prima facie*

nonsensical, but we must remember that from the vantage point of quantum physics mind is the ultimate and enduring reality, and for something to be an "alternative" it must be thought. A crude and unwieldly extrapolation of this analysis would be that, whenever a choice among particular futures is made, the universe branches or forks off in numerous directions to weave an infinite, intricate maze of correlative "time tracks." A second, but comparably confusing, picture is that of a universe "layered" with divergent space-time scenarios like an infinite deck of cards. Each card would amount to a single "destiny" for the universe *in toto*, and each specific selection of space-time options would be like drawing a card from the pile.

A multidimensional approach to the cosmological problem avoids the pitfalls of occultism as well as any controversial conjectures about a "second state"; yet by the same token it has no more plausibility than the belief in an "astral" reality. Why should there exist "infinite" worlds any more than only two or perchance three? A solution to this dilemma is tendered by John Gribbin in his book on time paradoxes. According to Gribbin, the monetary choice of futures does not "split" the universe, which harbors all possibilities, but merely focuses and pilots attention along a particular time trajectory.[31] What we experience as events in time and space are but ramblings through the labyrinth of correlated possible worlds along what physics calls the "path of least action."[32] The vehicle that wends its way through this labyrinth is consciousness. But consciousness may be either blinkered or free. If we are riding on a train and have the window shade drawn, we cannot see other trains passing on parallel tracks. But if we permit ourselves to peer outside our compartment, we can catch a glimpse not only of alternate rail systems but of the engines, cars, and passengers that rumble over them. The issue then is not whether ulterior dimensions exist; it concerns whether we have the desire or the ingenuity to view them.

Implications for Religion and Science

After all is said and done, however, we must ask ourselves to what degree the displacement of our familiar, physical concepts toward what usually has been dismissed as beyond the territory of science must leave an impact on our subsistent world view, especially with respect to religious and theological matters. Throughout the modern period religious apologists have styled themselves as carrying out a holding action against science's unabated assault on the sense of transcendence. Even today many theologians still feel they are commandeering this crusade; but they are quickly becoming like the celebrated soldiers of imperial Japan who hid out in the jungles of remote South Sea islands during World War II to evade capture and survived

there for more than thirty years without realizing that the fighting had long been over.

Indeed, it may well be that, as science trenches upon Anaximander's *apeiron* and blurs the borders of what Heisenberg has termed its "closed theories" to embrace the infinite, it will not only have raided but expropriated religion's earlier patent on mystery. That prospect, though, is not very likely. Across history Western religion and science have shared at intervals the same venturesome spirit as well as a common penchant for dogmatism. Early modern science performed a necessary task in demolishing the "closed world" of Medieval thought while supplying inklings of its own, callow version of an "infinite universe," even though when it emerged triumphant in the nineteenth century it reverted to some of the narrowness of its theological ancestry.[33] It might be argued that dogmatism, whether in theology or science, has been a congenital flaw in Western thinking overall. Westerners have pursued truth not by forging a vision of the whole but by sectioning the universe into manageable parcels for cautious scrutiny. At any rate, new vistas of unspeakable wonder are opening up before us, and physics—the most self-confident and prestigious of the natural sciences—is offering the first, privileged tours. Theologians would be well-advised to make early reservations. The caption for the emergent self-awareness in both science and religion could be the adage of the German Romantic poet Johann von Schiller:

> *Nur die Fülle führt zur Klarheit,*
> *Und im Abgrund wohnt die Wahrheit.*
>
> Only the totality brings us to clarity,
> And in the abyss dwells the truth.

NOTES

1. Michael Talbot, *Mysticism and the New Physics* (New York: Bantam Books, 1980), p. 37.

2. A good survey and critique of these tendencies in mid-twentieth century theology has been provided by the sociologist Peter Berger in *The Heretical Imperative* (Garden City, N.Y.: Doubleday, 1979). See especially chapters 4 and 5. Representative illustrations of what we might call the "empirico-linguistic" method in theological reflection are Gordon Kaufman, *An Essay in Theological Method* (Missoula, Mont.: Scholars Press, 1975); Wolfhart Pannenburg, *Theology and the Philosophy of Science* (Philadelphia: Westminster Press, 1976); and David Tracy, *Blessed Rage for Order* (New York: Seabury Press, 1975). "Natural theology" has been preserved by the so-called "Chicago school" in America, but it has been most directly allied in recent times with process thought. A major example is John Cobb, Jr.'s *A Christian Natural Theology* (Philadelphia: Westminster Press, 1965).

3. For a preliminary discussion of this changeover and a kind of prologue to the present article, see Carl Raschke, "The New Cosmology and the Overcoming of Metaphysics," *Philosophy Today* (Winter 1980): 375-87.

4. Werner Heisenberg has characterized this tendency as the process of "unshaping" in both the esthetic and naturalistic thrust of modernism. See his essay "Abstraction in Modern Art and Science" in *Across the Frontiers*, trans. Peter Heath (New York: Harper & Row, 1975), pp. 142-53.

5. Nigel Calder, *Einstein's Universe* (New York: Viking Press, 1979), p. 13.

6. Gary Zukav, *The Dancing Wu Li Masters* (New York: William Morrow, 1979), p. 200.

7. Victor Weisskopf, *Knowledge and Wonder: The Natural World as Man Knows It* (Cambridge, Mass.: MIT Press, 1979), p. 111.

8. Alfred North Whitehead, *Process and Reality* (New York: Macmillan, 1929), p. 76. A similar anticipation of this insight can be discerned in his statement that "the theory of objects is the theory of the comparison of events." *The Concept of Nature* (Cambridge: Cambridge University Press, 1964), p. 144.

9. Gerald Holton, *Thematic Origins of Scientific Thought* (Cambridge, Mass.: Harvard University Press, 1973), p. 144.

10. Niels Bohr, "Discussion with Einstein on Epistemological Problems in Atomic Physics," in *Albert Einstein: Philosopher-Scientist*, ed. Paul Schillp (Evanston, Ill.: Library of Living Philosophers, 1949), p. 210.

11. David Bohm, *The Special Theory of Relativity* (New York: W. A. Benjamin, 1965), p. 225. See Bohm's discussion of the revolutionary impact of quantum theory on the "new physics" in "Quantum Theory as an Indication of a New Order in Physics," in *Quantum Theory and Beyond*, ed. Ted Bastin (Cambridge: Cambridge University Press, 1971), pp. 119-34.

12. This view, which is becoming more cogent among quantum theorists, runs counter to the opinions of the early pioneers such as Heisenberg. The older standpoint is expressed by Eugene Wigner, who talks about "two kinds" of reality: "the existence of my consciousness and the reality or existence of anything else." See his *Symmetries and Reflections* (Bloomington, Ind.: Indiana University Press, 1967), p. 189.

13. Friedrich von Weizsächer, *The Unity of Nature*, trans. Francis J. Zucker (New York: Farrar, Strauss, Giroux, 1980), p. 235.

14. For an intriguing and provocative attack on the epistemological fundamentalism of modern philosophy and philosophy of science along these lines, which also has relevance for theology, see Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton, N.J.: Princeton University Press, 1979).

15. Fritjof Capra, *The Tao of Physics* (Boulder, Colo.: Shambhala, 1975), p. 130. For a brief synopsis of Capra's position, see his article "Buddhist Physics" in *The Schmacher Lectures*, ed. Satish Kumar (New York: Harper & Row, 1980), pp. 121-43.

16. Capra, *Tao of Physics*, p. 138.

17. Philip Wheelwright, ed., *The Presocratics* (New York: Odyssey Press, 1966), p. 162.

18. See David Finkelstein, "The Space-Time Code," *Physical Review* 5D (June 15, 1972): 2922.

19. William Arkle, *A Geography of Consciousness* (London: Neville Spearman, 1974), p. 112. For a comparable analysis, see Edward Russell, *Design for Destiny* (London: Neville Spearman, 1971), pp. 124-26.

20. Zukav (n. 6 above), p. 282.

21. See John Wheeler, *Geometrodynamics* (New York: Academic Press, 1962).

22. Quoted in Bob Toben, *Space-Time and Beyond* (New York: E. P. Dutton, 1975), p. 134.

23. Talbot (n. 1 above), p. 81.

24. See G. W. F. Hegel's defense of "science" as "self-consciousness" that unites the certainty of all existence with itself in the world-historical unfolding of the "shapes" of Spirit in the "Preface" to the *Phenomenology of Spirit*, trans. A. V. Miller (Oxford: Oxford University Press, 1977) p. 15.

25. Jorge Luis Borges, "John 1:14," in *In Praise of Darkness*, trans. Norman T. di-Giovanni (New York: E. P. Dutton, 1974), p. 17.

26. Conversation with Sarfatti in Toben, p. 154.

27. C. T. K. Chari, "Parapsychology, Quantum Logic, and Information Theory," in

Quantum Physics and Parapsychology, ed. Laura Oteri (New York: Parapsychology Foundation, 1975), p. 77.

28. See Michael Hare, *The Multiple Universe* (New York: Julian Press, 1968).

29. Robert Monroe, *Journeys Out of the Body* (Garden City, N.Y.: Doubleday, 1971), p. 74.

30. Hugh Everett, "The Theory of the Universal Wave Function," in *The Many-Worlds Interpretation of Quantum Mechanics*, ed. Bryce S. DeWitt and Neill Graham (Princeton, N.J.: Princeton University Press, 1973), p. 10.

31. See John Gribbin, *Time Warps* (New York: Dell, 1980) pp. 171-72.

32. See an exposition of this view in Fred Wolf, "The Question of Parascience: A Physicist's View," cited in Toben, p. 158.

33. For a discussion of this transition, see Alexander Koyré, *From the Closed World to the Infinite Universe* (Baltimore, Md.: Johns Hopkins University Press, 1957).