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Because "Cause" Makes Sense

The Anthropic Cosmological Principle and Quantum Cosmocausality

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Since the very structure of the universe is seen to be remarkably amenable to the existence and continued sustenance of the human race, the question thus becomes one of whether such a state of affairs can be explicated in theistic terms, more specifically, in relation to a theistically instantiated anthropic cosmological principle (ACP).

In order to pursue this line of thinking, a number of provisional definitions must be supplied. The ACP itself comes in four basic versions, but only two are dealt with here—the weak and strong anthropic principles,[1] each defined as follows:

1. The *weak anthropic principle* (WAP): "The observed values of all physical and cosmological quantities are not equally probable but they take on values, restricted by the requirement that there exist sites where carbon-based life can evolve and the requirement that the Universe be old enough for it to have already done so."
2. The *strong anthropic principle* (SAP): "The Universe must have those properties which allow life to develop within it at some stage in its history."[2]

Granted, these are technical definitions,[3] but a veritable plethora of such fine-tuned items exists, most of which are categorized as elementary lengths and times, fundamental constants, masses of elementary particles, physical fine structure constants, and even cosmic coincidences.[4]

In addition, a working definition of *quantum cosmocausality* (QC) is required. According to Stanley Jaki, the search for such an all encompassing, *a priori* definition of cosmic cause has always been with us historically, but a contemporary restatement of it is sorely needed. As Jaki explains:

> A broad awareness among cosmologists is still to arise concerning the very real possibility of knowing conclusively the intrinsic impossibility of knowing that the universe can only be what it is. The latter knowledge implies the necessary and exclusive character of the existing universe and can have therefore its source only in *a priori* considerations. To know the universe in such a way is not only very different from knowing all its quantitative correlations. . . , but also rigorously impossible. The ambition to formulate an explanatory framework in which the world appears to be a necessary form of existence is not new. It is as old as physics.[5]

Hence, the definition of QC is a synthesizing one; it must attempt conceptually to consolidate the six types of causality previously posited, utilized, and modified throughout the history of philosophy: material, formal, efficient, final, instrumental, and sufficient.[6] Although there is undoubtedly some overlap in meaning among these six accounts of cause, the tension between the demand for complete clarity and the conceptual inadequacy of existing causal terminology is especially marked in attempting to define QC.

The barest definition possible, then, is that QC is the all-encompassing conglomeration of the various strains of causal meaning, each of which is potentially involved in the creation of the universe as instantiated by God in all of its quantum-to-macro world particulars. With this in view, the present chapter will follow various theological, philosophical, and scientific leads into the universal "cause" of human beings, that is, an anthropic cosmological cause, if viewed *in toto*. Accomplishing this lends itself to several areas of study:

1. the fact that the universe and human beings are so propitiously and compatibly structured;
2. the relation of the supernatural to the concept of discontinuity:
3. the dilemma faced by empiricists who disregard metaphysics;
4. the ACP in relation to God as the mechanism for cosmic cause, something intrinsically involving a theoretical leap from the micro- to macroworld as well as an ontology of law;

5. the notion that the ACP serves as God's principle for regulating a created cosmos;
6. the defining of a theistic QC in light of the weak and strong versions of the ACP; and
7. an exploratory look at omnicausality with the universe as the product of a theistic QC whose six types of causation establish the ACP as God's regulative principle for creating and sustaining the universe.

With these seven items in mind, the ACP is ripe for a QC harvest. As anthropic theorist Nicola Dallaporta maintains, the ACP holds the key to a better scientific understanding of the universe, stating, "The recognition of the anthropic principle should be considered as a turning point in the development of science, opening new roads towards the unknown aspects of the universe."[7]

The Propitious Nature of Cosmic/Anthropic Compatibility

Many scientists uphold the fact that a singular compatibility of sorts is at work between human beings and their cosmic environment. While permeating the cosmos as a whole, the known laws of physics seemingly zenith to standards of near-perfection for the sake of humanity's presence on this planet, Earth. Because it is a match so propitious in nature, philosophers of science and cosmologists alike often voice their beliefs concerning this remarkably fine-tuned, cosmic/anthropic compatibility. On occasion, their words are characterized by tacit religious interference. At other times, they seem to preach words of straightforward theological appeal.[8]

In view of these cosmic/anthropic structural compatibilities, it is important to note that the ACP perspective most often endorsed by cosmic/biological evolutionary theorists is one devoid of any attached religious overtones. On the other hand, such compatibilities may also be reasonably expressed in terms of a divinely energized principle, one in complete accord with more historically pervasive explanations of creation wherein supernatural involvement is taken seriously.

Supernatural Involvement and Discontinuity

The question of supernatural involvement in the creation of the cosmos is, at bottom, as all-encompassing an inquiry as there can be. All the same, naturalistic scientists find it difficult to accept concepts of supernatural involvement in the creation of the universe because they are allegedly unsupported by accumulated evidence. The crux of the matter is whether the evidence,

rightly interpreted, points either to some form of external supernatural engagement or to some internal chance process operative from within.

Naturalists presume that succumbing to notions of supernatural creativity introduces a measure of discontinuity into the cosmological quest; it interrupts their vision of nature as a seamless web of causal connections.[9] Moreover, anxiety over supernatural discontinuity seems to manifest itself regularly in the field of evolutionary biology.[10] Even so, a proportionally fewer number of scientists tends to question whether the ontological status of "chance" creative processes is even a valid notion. Atheists, agnostics, and theists alike come under the influence of varying philosophical assumptions about what roles contingency and determinism should play in their respective investigations of cosmic cause.[11] This is best illustrated via the empiricist approach to knowledge gains.

The Empiricist Dilemma

Concerning empiricism, the tendency of scientists to isolate empirical issues from metaphysical concerns must be interpreted in terms of a false dichotomy.[12] Such an approach only serves to confirm empiricism's epistemological weakness. Deriving its coherence as a theory of knowledge solely from a sensory base, its openness to truths beyond the range of its own methodology is critically held captive. Furthermore, since empiricism is incapable of incorrigibly proving that factual truths beyond the sensory realm do not exist, and since the scientific method has traditionally relied too heavily on empirical measures alone for its advancement, whatever elements are said to compose *the* scientific method must not only be supplemented definitionally but also restructured procedurally. To the extent that scientific laws are arrived at through empiricist methods, to that same extent benefits provided by truths lying beyond the five senses (metaphysical truths) are forfeited, resulting in the loss of a more comprehensive metascientific perspective with respect to whatever metaempirical elements of created reality can be shown to exist.[13]

Philosopher of science Philip Gasper suggests a methodology similar to this, but concedes only partially a source for scientific law beyond empirical confines. Agreeing that causal relations seem to be scientifically necessary *and* irreducibly metaphysical in the face of nontheistic empiricist standards, Gasper analyzes how the traditional Humean interpretation of causal relations[14] continues to be applied by contemporary philosophers of science:

> Instead of offering a verificationistically unacceptable metaphysical explanation of appeals to theoretical considerations in identifying causal relations (according to which knowledge of unobservable causal

> mechanisms is being applied), the empiricist offers a conception according to which reference to laws of nature is part of the conventional definition of causal relations and the theory-dependence of methods is simply a manifestation of scientists' efforts to identify those laws.[15]

Here Gasper expresses dissatisfaction with the Humean notion of causality in which a determinate relation between events is left unspecified, except in the most general, unexplained way: a law of nature. He argues further that Hume mistakenly incorporates "the notion of a law of nature into the very definition of causal relations," and by contemporary philosophy of science standards this generates a deficient account of what "causation" actually means philosophically. References to unobservable causal relations are problematical by definition, Gasper affirms, but science is leading the way beyond the difficulties introduced historically by the Humean acausal interlude so as to reconstruct a more philosophically satisfying notion of causation.[16]

Further, Gasper's contemporary, Nancy Cartwright, also critiques the same timeworn meanings for cause that gave rise to the skepticist tradition, extending the impact of Gasper's censure of Hume while voicing her own position that empiricism's approach to causality is both misguided and unsubstantiated. It is not only possible, she maintains, but essential as well to seek out and apply explanatory causes to various physical phenomena in contradistinction to mere explanatory laws. To go beyond law to the cause of law is the real issue. Consequently, science, as an enterprise rightly concerned with methodology, must always be wary of confusing causal claims with theoretical accounts of phenomena based on natural law; superior causal explanations must eventually supersede inferior empiricist theories.[17] In brief, Cartwright's philosophy of science, like Gasper's, is non-Humean in its particulars and eager to achieve a philosophically corrected account of causality no longer encumbered by Humean frames of reference.

In response, a logical question arises: What is it that supersedes cause? All in all, such a question must be permitted on at least three counts: the fact that it is never directly asked; the inadequacy of naturalistic, cosmic/biological approaches to bring a genetically diverse mankind/*anthropos* into corporate being; and empiricism's past failures to examine sufficiently the philo/scientific side of causality in relation to a larger cosmic causality.

God as Cosmocausal Mechanism

According to Norman Newell, "Natural processes operating in accordance with natural laws do indeed represent 'supreme power,' the power of the universe, and the existence of this power is beyond dispute. Whether it is

called Nature or God is a matter of personal preference."[18] In other words, What is the creative power lying back of the universe? And the questions persist. For example, In what sense is the universe itself a cause-and-effect sequence and, as such, may it be delimited in terms of God himself? If so, Should God be considered as the actual causation agent of this cause-and-effect universe—or better, its anthropic causation agent, however difficult to explain or easy to devalue something so causally deterministic appears to be?[19] Thus, To what extent does God render precise the ostensibly deterministic, scientific/mathematical parameters of the cosmos for the sake of God's chief creation—humanity?[20]

In reply, the very framing of the questions involves totaling up a number of theo/philosophical integers: created *ontos*, plus a designing/intentioning *telos*, plus a sentient *bios*, plus a divinely imaged *anthropos*, plus a humanly habitable *cosmos*, plus the underlying cause-and-effect sequences operational within each, all adding up to a quantum-to-cosmos causal sum that points toward a duly evidenced theism. If God, then, is hypothesized to own a threefold creative role as (1) the *a priori* cause of the universe; (2) as its actual existence/sustenance mechanism; and (3) as humanity's anthropic causation agent, then God's existence and interaction with the cosmos and human beings themselves suddenly become reasonable assumptions. For cosmic/biological evolutionary forces to accomplish the same three-point task, while devoid of intelligence and empowered by chance alone, does not add up coherently.[21] Beyond this, a foray into the quantum world helps to illustrate this need for coherence.

A Metalevel Below

Conditions at the microcosmic level of reality are usually described as chaotic, random, and nonteleological in nature. In view of this, as reality moves from the quantum world up to the macroworld, the physical systems and processes operative throughout appear to involve teleological outworkings—those of "design" and "purpose." To "jump up" from the micro- to the macroworld is to acknowledge the existence of thermodynamic forces working at or below the quantum level. Yet these forces must necessarily and simultaneously be involved in some as-yet-unknown macrotransformational process; they must in some way be transformed into the more explicitly teleological processes so characteristic of the Newtonian macroworld. And all this, it should be stressed, is somehow accomplished while in seeming opposition to the renowned second law of thermodynamics, one of the most basic of natural laws.[22] This *chaos*-to-*telos* move, against the grain of the second law's stated purpose, is, for all intents and purposes, an outwardly inexplicable event.

Theorist F. David Peat, however, carefully addresses this very issue by suggesting that something akin to a "gentle action for a harmonious world" is functioning throughout the microworld environs.[23] What Peat proposes here is technically unsatisfying, but the very fact that he alludes to the existence of possible subprocesses and structures lying behind, or prior to, the chaos-to-order reality jump is significant in itself; it is scientific theory *au naturel* pushing the categories-of-reality envelope.

From another direction, Ilya Prigogine and Isabelle Stengers are also committed to finding workable answers to the chaos-to-order conundrum. One of their main conclusions reads, "At all levels, be it the level of macroscopic physics, the level of fluctuations, or the microscopic level, *nonequilibrium* is the source of order. *Nonequilibrium* brings 'order out of chaos.'"[24] In other words, some lack of thermodynamic equilibrium, a negative entropy of sorts, is essential to this quantal megaleap into the large-scale universe. Moreover, they try to reinforce their conclusions in terms of what they call "active matter," precisely the kind of matter needed to help speed along chaos and randomness to arrive at some semblance of macroworld order. In doing so, active matter not only transforms means to ends but also becomes engaged in an intrinsically irreversible process capable of negating the second law's entropic effects on the energy levels of the universe.[25]

The accuracy of these theories aside, the speculative efforts of Peat, Prigogine, and Stengers, as well as others,[26] grant future promise to the order-out-of-chaos enigma. Their labors may at least be interpreted as the search for some sort of mechanistic dialectic between chance and regularity within the cosmos. In essence, it is the search for a metalevel below, or behind, the quantum microworld, that is, an as-yet-undiscovered level of reality wherein the quantum-to-macro world puzzle is solved.[27] Moreover, such approaches help to provide a framework for reinterpreting the regularity side of this tricky dialectic equation. If asserted as a theistic framework, the regularity of the macrocreation must in some sense be predicated as God's cosmocausal mastery over (or negation of) the so-called instrumentalizing power of chance, with such lordship itself defined in terms of God's ongoing interactivity with both the quantum microcreation and the hypothesized metalevel just below it.[28] Although further warrant is needed, such a state of creative affairs is linked to the search for an ontology of law.

Ontology of Law

Venturing to construct an omnicomprehensive ontology of law for the created order is also important in understanding how God can be regarded as the cosmocausal mechanism at work within the cosmos. As the metaphysical

parallel to twentieth-century grand unified theories (GUTs) and theories of everything (TOEs), J. H. Lambert set forth precisely this kind of scenario, at least in nascent form, as far back as 1760.[29] Contemporary thinker Ted Peters also explores an ontology of law's cosmocausal possibilities, but articulates them in far more theistic terms than Lambert:

> Law is the one form of divine activity within the cosmos. Laws are the result of the intersection of God's faithfulness with the course of otherwise contingent events. God in the God self is *a se*, not bound to the cosmic order. What we experience as governing principles are ordinances freely invoked by God to keep the world in being—to keep it organized as a cosmos—for a given duration.[30]

Peters's definition here takes seriously the laws of nature and their implementing power, albeit derivatively by God, to keep the universe under theistic control.[31]

Howard J. Van Till also expresses a similar notion when, in speaking of the entirety of created things, he says: "Every category of structure, creature and process was conceptualized by the Creator from the beginning but actualized in time as the created material employed its God-given capacities in the manner and at the time the Creator intended from the outset."[32]

It is evident, however, that Peters and Van Till fall short of specifically connecting their views to the ACP itself, but their corporate philosophizing about ontological law in theistic terms has cosmocausal import insofar as, in their views, God ordains such a lawlike nexus in order to create and sustain the universe.

The Anthropic Cosmological Principle as God's Regulative Principle for Creation

The data gathered by exploring the quantum-to-universe domains may be interpreted scientifically and mathematically in terms of sheer anthropic parameters, but also in overtly theistic terms. In view of this, if the ACP is highlighted as the focal point of God's creative process (that is, as the regulative principle God employed to bring the universe into existence and maintain it as such), then it may be construed as having a significant cosmocausal role to play—that of the cosmocausal drive responsible for giving intelligibility to design/intentionality and mechanism/*telos*,[33] perhaps even as the connecting point between earthly physics and divinized metaphysics. As Friedrich Cramer asserts, "There are no physics without metaphysical basis, but it is of

utmost importance to define precisely the connecting point between physics and meta-physics in order to avoid a confusion of categories."[34]

True to his own premises, Cramer is referring here to a naturalistic ACP in the context of cosmic/biological evolutionary forces. For purposes of instituting a theistic QC, however, if Cramer's connecting point between physics and metaphysics is cosmically expressed in terms of a theistically wrought ACP, then it is simply a substitution of contexts that enables the universe to become God-organized as opposed to self-organized, with theory and metatheory cosmocausally linked within the ACP itself. Such a hypothesis is at least in keeping with what some anthropic theorists have themselves already concluded. For example, George Schlesinger remarks, "Over an extended period science has kept providing results that the adversaries of religion have been able to use as their ammunition. The anthropic principle seems to redress the imbalance, since for a change it offers at least a prima facie argument supporting the theist."[35]

Summary

In summary, a full-bodied theistic QC must be cognizant of the compatibility structures now existing between the universe and the human species, in which case it may be couched in terms descriptive of a supernatural discontinuity at work over against the continuous forces of cosmic/biological evolution. Positing a creator-God as the mechanism responsible for a cosmos consummately fit for humanity involves a limited understanding of the micro-to-macroworld transformation process intrinsic to creation. The hypothesis of a reality mechanism existing below the quantum world that both undergirds and assists it in bringing the macroworld to present order is seemingly a necessary one. In addition, an ontology of law of sorts, based on theistic premises, is at work cosmocausally throughout the created order in connection with this metalevel below. Then, over time, God utilizes the ACP itself—intrinsically comprised of a body of numerous, unchanging constants and parameters—as the regulative principle for instantiating and organizing created reality at all levels. How the ACP in its weak and strong versions fits into this overall picture of a theistic QC is addressed next.

The Anthropic Cosmological Principle—Weak and Strong

The Weak Anthropic Principle

Concerning empiricism, the WAP seems to underscore the empiricist dilemma noted earlier, that a strictly empirical approach to the acquisition and interpretation of knowledge is by definition hindered from probing into

knowledge realms that are metaphysical in nature. As a consequence, the scientific enterprise today embodies elements of skepticism with respect to how reality should not be interpreted apart from an empirical *modus operandi*.[36] Furthermore, empiricism's lack of metaphysical perspective cultivates an atmosphere of unfamiliarity with respect to the cosmos, that is, the harmonious intricacies revealed in the very structures of the micro- and macrouniverses are often overlooked in the pursuit of rigorously amassing facts.[37]

Empirical approaches to knowledge are undoubtedly efficient at accumulating experimental facts but seemingly ineffectual when it comes to modeling them into constructive interpretational frameworks, a task requiring a metaphysical point of view if it is to operate productively. And if the WAP's straight numbers and coincidental relations are, in fact, placed within a metaphysical framework—one that upholds the viability of antichance operations—then a basis for constructing a theistic QC is partially established. Insofar as the shaping of the anthropic "facts" (constants and parameters) into a theistic paradigm is accomplished, the survivability of the explanatory power of theistic ACP arguments is assured. According to John Polkinghorne:

> It is fair to inquire whether [the anthropic parameters] will . . . survive the advance of knowledge. . . . [W]hile correlations in the structure of the world may be revealed to us which are currently hidden and which may explain naturally what now seems to be coincidental, there is likely to remain a degree of balance necessary for life and irreducibly given in scientific terms, which will call for a deeper explanation.[38]

Hence, a WAP backed by theistic concerns confirms the need for constructing a quantum cosmology that takes God's role seriously as the cosmocausal impetus for the creation of the universe.

The Strong Anthropic Principle

Concerning those who deny the relevance of the SAP and what Brandon Carter calls its "anthropic enigma," many theoretical physicists are still optimistic about undermining its influence as a principle. To accomplish this, however, the "underlying physical mechanisms fixing" the WAP's "independent fundamental constants" would have to be discovered, documented, and unquestionably recognized by everyone concerned. Such measures would provide the means for theorists to argue that "at the [SAP's] deeper theoretical level" the WAP constants could have no other set of values than what they presently exhibit.[39] In deciphering Carter's meaning here, it seems that

he is simply stating that if the SAP can demonstrate a strictly physical reason for how and why the WAP's constants/parameters have the numerical values they do, then it is unnecessary to resort to some metaphysical source to explain these already existing values. In essence, it is the search for why we are here; it is the propagating of a formal naturalistic cause over against the acknowledgment of a possible supernatural cause that Carter and others are trying to advance.

From another direction, other anthropic theorists strive to sidestep the obstacle of cause altogether so that troubling deliberations about how and why a supernatural cause brought the universe into existence (especially for divinely created human beings to inhabit!) are either ignored or suppressed in favor of a bare cosmic/Darwinian teleology. As anthropic theorist Livio Gratton phrases it:

> The inconsistency of SAP is that it is not a causal but a *teleological* argument. . . . In fact, after Darwin, every sensible man is aware that plants and animals have evolved in order to adapt themselves to environmental conditions and not, on the contrary, that these conditions have been expressly planned to make their life possible.[40]

Hence, Gratton's approach here is not truly cosmocausal in scope, siding instead with a cosmic/bioevolutionary version of teleology as opposed to a scientifically causal teleology wherein the cosmos first and humanity second were "genesised" into being, only to take up their divine *telos* from that point onward in accordance with God's planned initiative.

As its name implies, the strong anthropic principle goes beyond the effectiveness of the WAP in its attempt to give cosmocausal impetus to the creation and maintenance of the universe. As George Ellis asserts, "I understand the Anthropic Principle's primary role as being to enable us to comprehend causal links we would not otherwise realize existed."[41] Paul Davies contends more strongly than Ellis that the very laws of nature governing the cosmos function as they do because of the universal, regulatory potential of the SAP: "The strong anthropic principle can therefore be regarded as a sort of organizing meta-principle, because it arranges the *laws* themselves so as to permit complex organization to arise."[42] In other words, the forces of cosmocausality at work in the universe take on aspects considerably more powerful than what the blind nonteleological forces of cosmic/bioevolution are able to support. Sheer cosmocausal forces, then, may be examined more perspectivally than what the prevailing ACP literature allows for; that is, they may be scrutinized with all due fairness through the lens of a pan-causal framework, a theistic quantum cosmocausality.

Toward a Theistic Quantum Cosmocausality

The idea that theistic causal powers are at work in the universe and are conversant with it on both quantum and cosmological scales is a reasonable one inasmuch as other origins mechanisms are proving to be increasingly incapable of producing the desired result, namely, a cosmos inhabited by human beings.[43]

Omnicausality

So does the ACP cause cosmocausality to function, or does God allow the ACP to run on its own power, derivatively granted? Further, does God cause the ACP to cause such things as existence, design, and intentionality? And how far back do theology, philosophy, and science have to go, logically and temporally, to differentiate between God himself and the cosmocausal mechanism at work to create a universal environment fit for human beings? And, if no such distinction can ever be formulated by finite human minds, is it entirely beyond the realm of possibility for God as Creator to be in control of every quantal movement, in charge of the quantum machinations of the roughly 10^{80} atoms estimated to comprise the cosmos—a determinate omnicausality, if you will?[44] Some argue that if God is only responsible for having caused or directed even a single quantum, space-time event throughout the history of the universe, then God is omnicompetent, such that God can have controlled every quantum space-time event up to the present moment.[45]

It is doubtful whether any theologian, philosopher, or scientist knows the definitive answer to questions like these. But that is not to say that a Christianized version of the ACP—serving as the basis for a theistic QC, while desiring to explore deeply the finely tuned constants and parameters built in to the universe—is merely theo/philosophical sophistry.[46] Nor does it mean that if God chose voluntarily to use an instantiating-of-created-reality principle such as the ACP to manufacture and support a universe requiring a minimum of divine intervention to work, then "God Himself, if he really created the world, must have been an extremely lazy creator."[47]

The truth of the ACP matter is this: the instantiating into *ontos* of a cosmological *telos* to work on God's behalf as the regulatory creative principle of the universe is a difficult-to-define proposition. On the other hand, it is *not* very hard to differentiate its intent and purpose from the premises lying behind a naturalistic ACP; namely, that some evolutionary force is operative categorically, yet entirely wrought by chance.[48] Considering such omnicausal matters, the potential for assimilating the six types of cause

mentioned earlier into an all-inclusive causal framework functioning in connection with the ACP itself will now be investigated.

The Canonical Conjugates of Cause[49]

In distinguishing the six types of cause, it is first necessary to note that the very idea of a first cause for the universe has fallen out of favor on many different levels. If Stanley Jaki is correct, however, the contemporary philosophical scene rejects the concept because it is too much in league with a more scientifically unacceptable class of causal theories—those dealing with the God of the Bible. As Jaki candidly remarks:

> One may . . . suspect that belief in the "scientific" overthrow of the principle of causality would not have become a tone of thought of our age, had this scientific age of ours not already parted with belief in the First Cause which makes all other causation possible. . . . Those who know something of the remorseless law of logic will not be surprised on finding that if reality or objective coherence fails to be accepted, any analysis of knowledge becomes a celebration of incoherence."[50]

For the sake of coherence, the six types of causes are summarized below in relation to how the ACP may be said to function cosmocausally within the universe via God's unfolding plan (see figure 8.1).[51]

Type of Cause	Definition	ACP Cosmocausal Function
Material cause	That out of which something is made	Quantum particles
Formal cause	The design or idea followed in the process of making something	Created reality's design as it existed in God's mind
Instrumental cause	The means or instrument by which something is made	ACP-design instantiated as space-time reality
Final cause	The purpose for which something is made	Cosmos for *anthropos*
Efficient cause	The chief agent causing something to be made	God
Sufficient cause	A cause equal to the task of causing something to be made	Only God

Figure 8.1

Expanding on this panoply of the ACP's cosmocausal capacities, the ACP itself is not the material cause of the universe, but it functions as God's regulatory, instrumentalizing causal principle for existencing atomic/subatomic materials into space-time being *ex nihilo*, creating them at or below a quantum level of reality in order to instantiate ontologically the formal design of the cosmos as originally conceived by God. On its way to God's *final* cause for the universe, a home for *anthropos*, the quantum materials are instrumentalized and configured mathematically by the ACP into whatever constants and parameters are absolutely necessary for forming and sustaining a universe of macroproportions through *creatio continua* means, a universe intentioned as it is for the sake of human beings from the very first moment of creation. And God, of course, is both the efficient cause and only sufficient cause of the entire ACP process—cosmocausal in its God-scope—as opposed to a nonteleological, cosmic/bioevolutionary force somehow unfolding itself so propitiously for humanity's sake on the basis of sheer chance events alone.

Conclusion

Somewhere Francis Bacon has said, "Inquiry into final causes is sterile, and like a virgin consecrated to God, produces nothing."[52] In like manner, this may be one's immediate reaction to a notion as ambitious as developing a theistic QC—that it will produce nothing of real consequence. On the other hand, many believe it to be a fruitful endeavor, whether on theological, philosophical, or scientific grounds. Further work is in the offing, granted, but even to conceptualize causation itself is an exceedingly difficult proposition. Nevertheless, as one theorist puts it, "The centrality of the concept, both to ordinary practical discourse and to the scientific description of the world, is difficult to deny."[53]

This, then, is a provisional rendering of what could be called theistic quantum cosmocausality, one in which both versions of the anthropic cosmological principle—the WAP and the SAP—serve constructively as its very basis. Future efforts are sure to improve upon this stated conclusion, but one can do no better than appeal to Stanley Jaki's seasoned insights once again:

> Once one truth, the truth of knowing reality is not let in. . . , no truth whatever about reality is any longer forthcoming and certainly not the most important truth, about the totality of real things, namely, that a specific, consistent, thoroughly one universe cried out for a necessary Being as its sole *raison d'être*. Only such a Being can call into existence the universe, a process called creation out of nothing. Such a process

> is the deepest, though most luminous mystery which alone can shed light on anything else and prevent rational discourse from relapsing into irrational reversals of its progress. That modern science displays with astonishing effectiveness, the specificity, consistency, and unity of the universe, . . . can certainly reassure the theist that in addition to philosophy, science too is on his side and not on the side of atheists.[54]

In other words, the cause of the universe is, at the very least, vitally related to truth and the reasonable expression of truth. Further, if God is characteristically true and simultaneously relates to the universe as its Creator and Sustainer, then it follows reasonably that God is also the one who cosmocausally instantiated it into being for a divine purpose—that purpose being, in one sense, for the sake of scientists themselves, whether Christian, agnostic, or atheistic. Moreover, such a viewpoint may be seen as the basis for establishing the very concept of scientific explanation in the first place, and, once established, such explanations as finely tuned anthropic principles may serve to elevate and empower the status of whatever scientific methods and procedures are eventually used to study creation's mysteries productively.

As Ernan McMullin maintains, appealing to God as the Creator and Preserver of the universe is not really an "appeal . . . to a 'gap' in scientific explanation" so much as it is "to a different order of explanation that leaves scientific explanation intact, that explores the conditions of possibility for there being *any* kind of scientific explanation."[55] To say that God creates and sustains the universe cosmocausally via anthropic principles fine-tuned for our existence as human beings is to offer up more than a mere declaration of the fact. Instead, if God himself instantiates a universe into being via the sixfold, ACP-delineated causal package already examined, then such a proposition goes beyond what any naturalistic analysis of causation/causality could ever hope to accommodate. Why? Because in the very defining of these causes, there obtains a theo/philosophical richness that naturalism categorically rejects, an aliveness to God's awesome majesty that might otherwise go undeclared except for the disclosures that the ACP and a theistic QC bring to our rapt attention, in turn, taking something of the edge off of the mystery that God's created order poses to our given yet truncated framework of reality.

In closing, then, when it comes to God's action in the world via anthropic cosmological principles and their required linkage to theistic quantum cosmology, the words of Isaiah 55:9 ring all the more true: "For as the heavens are higher than the earth, so are My ways higher than your ways, and My thoughts than your thoughts" (NASB). Thus, in moments of God-given clarity: intelligent cause makes sense![56]

24. John Bishop, *Natural Agency* (Cambridge: Cambridge University Press, 1989), 1.

25. Thomas Nagel, *The View from Nowhere* (New York: Oxford University Press, 1986), 110.

26. Hasker, *The Emergent Self*, chap. three; John Bishop, *Natural Agency*, 32–38.

27. Joshua Hoffman and Gary S. Rosenkrantz, *Substance: Its Nature and Existence* (London: Routledge, 1997), 98–99.

28. E. Mayr, *Populations, Species, and Evolution* (Cambridge: Harvard University Press, 1970), 4.

29. David Hull, *The Metaphysics of Evolution* (Albany: State University of New York Press, 1989), 4.

30. Paul Churchland, *Matter and Consciousness* (Cambridge: MIT Press, 1984), 21.

31. Jaegwon Kim, *Mind in a Physical World* (Cambridge: MIT Press, 1998), 37–56.

32. Cosmides and Tooby, *Evolutionary Psychology: A Primer* (see n. 23).

33. Alvin Plantinga, *Warrant and Proper Function* (New York: Oxford University Press, 1993), chaps. 11–12.

34. Michael Ruse, "Evolutionary Theory and Christian Ethics," in *The Darwinian Paradigm: Essays on Its History, Philosophy, and Religious Implications* (London: Routledge, 1989), 262–69.

35. Swinburne, *The Evolution of the Soul*, 208; cf. chaps. 11, 12.

36. John E. Post, *Metaphysics: An Introduction* (New York: Paragon House, 1991), 121.

37. Nagel, *The View from Nowhere,* 27.

38. Cosmides and Tooby, *Evolutionary Psychology: A Primer* (see n. 23).

39. Churchland, *Matter and Consciousness*.

40. Kim, *Mind in a Physical World*, 29–37.

41. Geoffrey Madell, *Mind & Materialism* (Edinburgh: Edinburgh University Press, 1988), 6.

42. John Searle, *The Rediscovery of the Mind* (Cambridge: MIT Press, 1992), chaps. 1, 2.

43. Buss, "Evolutionary Psychology," 280.

Chapter 8

1. Referred to hereafter as the WAP and the SAP.

2. John D. Barrow and Frank J. Tipler, *The Anthropic Cosmological Principle* (New York: Oxford University Press, 1986), 16, 21.

3. More simply, the weak version of the ACP may be construed simply as the pure variables, the straight numbers that seem to carry extremely improbable coincidental relations to the observed properties of the universe. In contrast, the strong version may be denoted as an organizing principle for why the fundamental constants and parameters of the universe *must* exist as they do. It is as if the principle takes on the accouterments of a deeper physical mechanism, the purpose of which is to fix the values of the constants and parameters so that human beings can exist within the cosmos. With journalistic flair, Dennis Overbye writes: "The features in question are mysterious numbers in the equations of physics and

cosmology, denoting, say, the amount of matter in the universe or the number of dimensions, which don't seem predictable by any known theory yet. They are like the knobs on God's control console, and they seem almost miraculously tuned to allow life." "Zillions of Universes? Or Did Ours Get Lucky?" *The New York Times*, October 28, 2003.

4. Reinhard Breuer, *The Anthropic Principle: Man as the Focal Point of Nature*, trans. Harry Newman and Mark Lowery (Boston: Birkhäuser, 1991), 238–44. Cf. Walter L. Bradley, "The 'Just So' Universe: The Fine-Tuning of Constants & Conditions in the Cosmos," *Touchstone: A Journal of Mere Christianity* (July/August 1999): 70–75.

5. Stanley L. Jaki, *Cosmos and Creator* (Edinburgh: Scottish Academic Press, 1980), 48. The only proviso to this, he continues, is that it may be impossible to achieve a definitional package large enough to accommodate the input of each and every interested party. Although Jaki does not specifically utilize the term *quantum cosmocausality*, he is at least calling for an *a priori* explanatory framework of cosmic cause.

6. The Greek philosopher Aristotle (384–322 BCE) was the first to analyze carefully at least four of six of these versions of cause but only after distinguishing their different emphases in the teachings of his philosophical predecessors: Plato, Socrates, and a few of the pre-Socratics. Found in his *Metaphysics* I. 3, Aristotle divided causality/causation into four categories: material cause, formal cause, efficient cause, and final cause. See Paul Edwards, ed., *The Encyclopedia of Philosophy* (New York: Macmillan, 1972), vol.1, s.v. "Aristotle," by G. B. Kerferd. Others, however, find two other kinds of cause in his works: instrumental cause and sufficient cause. See R. C. Sproul, *Not a Chance*: *The Myth of Chance in Modern Science and Cosmology* (Grand Rapids: Baker, 1994), 195–97. Whether these two particular kinds of cause and effect are actually located within the Aristotelian corpus is debated. Some researchers see them as more properly derived from later philosophers such as René Descartes, Nicolas de Malebranche, Göttfried Wilhelm Leibniz, Baruch Spinoza, David Hume, and J. S. Mill; also Edwards, *The Encyclopedia of Philosophy*, vol. 2, s.v. "Causality," by Richard Taylor.

7. Nicola Dallaporta, "Metaphysical Outlooks in Physics and the Anthropic Principle," in *The Anthropic Principle: Proceedings of the Second Venice Conference on Cosmology and Philosophy, November 18–19, 1988*, ed. Francesco Bertola and Umberto Curi (New York: Cambridge University Press, 1989), 164.

8. For example, Ian Barbour states that "the cosmos seems to be balanced on a knife edge" ("Creation and Cosmology," in *Cosmos as Creation: Theology and Science in Consonance*, ed. Ted Peters [Nashville: Abingdon, 1989], 130). Freeman Dyson infers more openly, "The more I examine the universe and the details of its architecture, the more evidence I find that the universe in some sense must have known we were coming" (*Disturbing the Universe* [New York: Harper & Row, 1979], 250). Another respected astrophysicist, George F. R. Ellis, believes that "the existence of life in general, and intelligent life in particular, is an incredibly unlikely eventuality, both in terms of the possibility of its existence (that is, the compatibility of the possible structures of intelligent life with the local laws of physics) and of the probability of its evolution" (cited in Breuer, *The Anthropic Principle,* 12). And more explicitly yet with regard to divine cause, George Greenstein examines the evidences for a theologically engineered universe only to deduce that "as we survey all the evidence, the thought insistently arises that some supernatural agency—or, rather, Agency—must be involved. Is it possible that suddenly, without intending to, we have stumbled upon scientific proof of the existence of a Supreme Being? Was it God who stepped in and so providentially crafted the cosmos for our benefit?" (*The Symbiotic Universe: Life and Mind in the* Cosmos [New York: William Morrow, 1988], 27).

9. Charles B. Thaxton, Walter L. Bradley, and Roger L. Olsen, *The Mystery of Life's Origin: Reassessing Current Theories* (New York: Philosophical Library, 1984), 201. The authors confirm their point by citing J. W. N. Sullivan, a one-time science writer for *Time* magazine, who wrote as far back as 1933 that "[creation] carries with it what are felt to be, in the present mental climate, undesirable philosophic implications, and it is opposed to the scientific desire for continuity. It introduces an unaccountable break in the chain of causation, and therefore cannot be admitted as part of science unless it is quite impossible to reject it. For that reason most scientific men prefer to believe that life arose, in accordance with the laws of physics and chemistry." J. W. N. Sullivan, *The Limitations of Science* (New York: Viking, 1933), 94.

10. See Michael Denton, *Evolution: A Theory in Crisis* (Bethesda, Md.: Adler & Adler, 1986), 353: "The idea that life might be fundamentally a discontinuous phenomenon runs counter to the whole thrust of modern biological thought. The infusion with the spirit of continuity has been so prolonged and so deeply imbibed that for most biologists it has become quite literally inconceivable that life might not be a continuous phenomenon."

11. A strong view of cosmic necessity would say that "no genuine form of contingency would have ever *really* existed in the universe, because all outcomes would have been both foreseen and predetermined by God beforehand," whereas a weaker view of cosmic necessity would posit that the development of the universe was "only necessary in fact. . . , and *not* logically necessary *per se*," a view that would preserve a weak form of contingency (i.e., freedom) in the universe while simultaneously avoiding the spectre of absolute determinism." M. A. Corey, *God and the New Cosmology: The Anthropic Design Argument* (Lanham, Md.: Rowman & Littlefield, 1993), 225–26. Livio Gratton, however, wants to dispense with these categories completely in relation to the anthropic potentialities of the cosmos. Preferring the role of agnostic, he states: "It is impossible to say whether a series of events has been produced by a chance process, . . . [T]he only thing we can say is that a series of events satisfies or does not satisfy the tests which we have tried on it. . . . [I]nnumerable pointless discussions upon determinism and indeterminism were caused by forgetting this simple argument" ("Metaphysical Outlooks," in *The Anthropic Principle: Proceedings*, ed. Bertola and Curi, 166).

12. While it is true that the general definition of *empiricism* has received different emphases and refinements historically, it is defined here as the epistemological theory that experience alone rather than reason is the source of knowledge. See Edwards, ed., *Encyclopedia of Philosophy*, vol. 2, s.v. "Empiricism," by D. W. Hamlyn. Philosopher of science Lawrence Sklar characterizes empiricism by the following description: "The observational/nonobservational distinction bears a heavy burden in empiricist approaches to theories. That such a distinction exists and that its existence is not overly context-relative seem essential if observationality is to play as distinguished a role in our account of the sources of knowledge and of meaning as the empiricist demands. . . . In realms of epistemic warrant, observations are, for the empiricist, foundational. All knowledge of reasonable belief . . . begins with our knowledge of the contents of observation. For some empiricists observational facts can be known with certainty. For the more modest they are the only facts of the world that bear intrinsic, noninferential warrant for belief" (*Philosophy and Spacetime Physics* [Berkeley: University of California Press, 1985], 168).

13. A number of biblical materials/science harmonization schemas could be introduced here in order to argue for the existence and justification of metascientific viewpoints, especially those attempting to overcome empiricism's deficiencies. But this would

go beyond the intent of the present study. Suffice it to say that although the Gen. 1:1-2:4 account of creation (as well as other passages relating to creation) should not be understood hermeneutically as scientific reference material, it does in fact depict a metacosmology of sorts. Whether it is interpretationally consistent or nonconflicting with reference to scientific facts is the provocative hermeneutical issue. According to Robert John Russell: "*Any* scientific cosmology must in *some* sense be consistent with the doctrine of creation since it ought not contain within it and proper to it a metascientific counterpart to the concept of God." In context, Russell is saying that created reality is not to be equated with God himself so that pantheistic interpretations of reality may be avoided, but metascientific/metaempirical concerns are nonetheless intrinsic to creation texts. Robert John Russell, "Cosmology, Creation, and Contingency," in *Cosmos as Creation*, ed. Peters, 205.

14. Philosopher David Hume's interpretation of causal relations basically states that it is impossible to see "causes" in and of themselves, but it *is* possible to observe successions of events. In his own words: "We may define a cause to be *an object, followed by another, and where all the objects similar to the first are followed by objects similar to the second*. Or in other words *where, if the first object had not been, the second never had existed*. The appearance of a cause always conveys the mind, by a customary transition, to the idea of the effect. We may, therefore, suitably to this experience, form another definition of cause, and call it, *an object followed by another, and whose appearance always conveys the thought to that other*" (*Enquiries Concerning Human Understanding and Concerning the Principles of Morals*, ed. L. A. Selby-Bigge, 3d ed. [Oxford: Clarendon Press, 1975], 76–77). Cf. Colin Brown, *Miracles and the Critical Mind* (Grand Rapids: Eerdmans, 1984), 82–83.

15. Philip Gasper, "Causation and Explanation," in Richard Boyd, Philip Gasper, and J. D. Trout, ed., *The Philosophy of Science* (Cambridge: MIT Press, 1991), 290–91.

16. Gasper, "Causation and Explanation," 291–92.

17. Nancy Cartwright, "The Reality of Causes in a World of Instrumental Laws" in *The Philosophy of Science*, 379–80. Note the approach of Henry J. Folse: "The metaphysical task of reconstructing the scientists' world-view in whatever way is necessary. . . demands to be dealt with from a perspective that accepts at least the *possibility* of constructing a philosophy of nature. For this reason the opponent to the scientific realist cannot be a Humean skeptic" ("What Does Quantum Theory Tell Us about the World?" *Soundings* 72, no. 1 [Spring 1989]: 183).

18. Norman D. Newell, *Creation and Evolution: Myth or Reality?* (New York: Columbia University Press, 1982), 155.

19. "In saying that God is, and that God is Creator, we do not affirm that he . . . is any ordinary 'cause' in the physical nexus of the universe itself-otherwise God would be neither explanation nor possible meaning." Arthur R. Peacocke, *Creation and the World of Science* (Oxford: Clarendon Press, 1979), 77–78.

20. William P. Alston argues for the philosophical integrity of "causal determinism" in that universal divine agency may be said to follow logically from it as an inevitable feature of the universe. See "God's Action in the World," in Ernan McMullin, ed., *Evolution and Creation* (Notre Dame: University of Notre Dame Press, 1985), 200–01.

21. "I would like to argue that to exclude intelligent design *a priori* as a working hypothesis . . . is both gratuitous and anti-intellectual. . . . Indeed, it must be acknowledged that it is at least logically possible that a personal agent existed before the appearance of the first life on earth. It is therefore at least logically possible that such an agent

(whether visible or invisible) designed or influenced the origin of life on earth." Stephen C. Meyer, "Laws, Causes and Facts: Response to Michael Ruse," in Jon Buell and Virginia Hearn, eds., *Darwinism, Science or Philosophy? Proceedings of a Symposium Entitled "Darwinism: Scientific Inference or Philosophical Preference?"* (Richardson, Tex.: Foundation for Thought and Ethics, 1994), 33–34.

22. The second law of thermodynamics states that "the entropy of the universe tends to a maximum," where entropy is defined as "the measure of the total disorder, randomness, or chaos in a system," with the effect of increased entropy being that "things progress from a state of relative order to one of disorder." Richard P. Brennan, *Dictionary of Scientific Literacy* (New York: John Wiley & Sons, 1992), 296. Cf. Ervin Laszlo, *Evolution: The Grand Synthesis* (Boston: New Science Library, 1987), 15, 21–22; and George Murphy, "Time, Thermodynamics, and Theology," *Zygon: Journal of Religion and Science* 26, no. 3 (September 1991): 363–66.

23. See F. David Peat, *The Philosopher's Stone: Chaos, Synchronicity, and the Hidden Order of the World* (New York: Bantam Books, 1991), 204–31. Peat further states that his doctrine of gentle action explains why a system that appears superficially chaotic may be correlated at a deeper level in such a way that its distant parts are ordered nonlocally. What appears to be a simple increase in entropy, or disorder, then, could conceal a more subtle form of order. Microworld chaos, he believes, "may conceal a rich and infinitely complex degree of order that lies beyond conventional description" Ibid. (228).

24. Ilya Prigogine and Isabelle Stengers, *Order out of Chaos: Man's New Dialogue with Nature* (New York: Bantam, 1984), 286–87. Officially known as "nonequilibrium thermodynamics," Prigogine and his associates work under the stated assumption that further research in the area will eventually yield results as unusual as those of relativity and quantum mechanics. See Prigogine's two volumes, *From Being to Becoming* (San Francisco: W. H. Freeman, 1980) and *Thermodynamics of Irreversible Processes*, 3d ed. (New York: Interscience, 1967).

25. Ibid., 288–90. For a briefer treatment of Prigogine's views, see Ilya Prigogine, "Man's New Dialogue with Nature," *Perkins Journal of Theology* 36, no. 4 (Summer 1983): 4–14.

26. Friedrich Cramer, for instance, opts for an evolutional field theory to explain the entropy problem: "There exists an evolutional field, in which matter organizes itself. Self-organization or the evolutional field cannot be separated from matter" ("The Entropic versus the Anthropic Principle: On the Self-Organization of Life," in *The Anthropic Principle: Proceedings*, ed. Bertola and Curi, 137.

27. In March 1994, I spoke briefly with William Klink, a professor of physics at the University of Iowa, about the possibility of the existence of such a metalevel below the quantum world. Dr. Klink was kind enough not only to provide an answer, but also to recommend his then yet-to-be-published journal article, now in *Zygon*, in which he touches upon the subject in a roundabout way. His response to my question was that, if such a realm exists, we will never be able to locate it apart from another "in-breaking" of God into human science, *an "in-breaking" equivalent to or surpassing the ones God has already given us through relativity and quantum theories!* Dr. Klink's thoughts about these "in-breakings" are found in his "Ecology and Eschatology: Science and Theological Modeling," *Zygon: Journal of Religion and Science* 29, no. 4 (December 1994): 529–45 (emphasis mine).

28. Interestingly, William Alston reverses the usual way of looking at the quantum world's state of "irregularity" in order to favor its "regularity" aspects. In building a case

for quantum causal determinism, pending as it may be, Alston surmises: "Many thinkers today hold that the results of quantum mechanics show that no physical events are strictly causally determined though for macroscopic events the chances of things having come out differently are negligible. It would be interesting to explore the bearing of a quantum mechanical point of view on the case for universal divine agency. Could we think of God as having . . . used means that are only very, very, very likely to bring [a quantum action] about? I would think so" ("God's Action in the World," 202). Alston, 203, also subsumes the free actions of human beings under the rubric of God's causal determinism: "Free autonomous created agents, as much as other creatures, exist and exercise their powers only because God continuously sustains them in existence. And the divine omnipotence extends to them as much as to other creatures. . . . In allowing some created agents a say in what they do, God is also giving them a share in causally determining other sorts of events. Human voluntary actions themselves have effects as much as any other worldly happenings."

29. J. H. Lambert asks: "How would you connect . . . time and space with one another, so that all this would be governed by one universal law? . . . I can never imagine that, when each part has the most perfect order, this order should be missing in the whole. The world-edifice is a whole and ought therefore to be necessarily interconnected through universal laws" (*Cosmological Letter on the Arrangement of the World-Edifice*, trans. Stanley L. Jaki [Edinburgh: Scottish Academic Press, 1976], 107).

30. Ted Peters, "Cosmos as Creation," in *Cosmos as Creation: Theology and Science in Consonance* (Nashville: Abingdon, 1989), 101. In addition, the well-respected philosopher R. B. Braithewaite deliberates about "ontology of law," indicating that "scientific" explanations of things never seem to live up to expectations whenever deductive systems of natural law fail to ground themselves in a higher, more comprehensive level of laws, which, in turn, must appeal to still higher premises. As Braithewaite puts its, "At each stage of explanation a 'Why?' question can significantly be asked of the explanatory hypotheses; there is no ultimate end to the hierarchy of scientific explanation, and thus no completely final explanations" (*Scientific Explanation* [Cambridge: Cambridge University Press, 1953], 347). In other words, if science alone tries to explain the "lawful" behavior of created reality, the "lawfulness" of natural laws will never be sufficiently finalized with respect to its beingness, its ontological status. Along these lines, R. Nobili sees the counterfactual difficulty posed by an ontologically deprived quantum world: "The basic difficulty in understanding the biological character of the universe lies in the difficulty to understand the ontological status of the physical world as stated by quantum mechanics" ("Metaphysical Outlooks," in *The Anthropic Principle: Proceedings*, ed. Bertola and Curi, 166).

31. According to Howard Van Till, some scientists are "guilty of the common error of thinking that the 'laws of nature' govern the behavior of the universe. They do no such thing. . . . The 'laws of nature' are only our finite and fallible attempts at describing the regular patterns of behavior that we observe in the world around us. The identity of the ultimate power that governs those patterns must be determined on extra-scientific grounds." Howard J. Van Till, Clarence Menninga, and Davis A. Young, *Science Held Hostage: What's Wrong with Creation Science AND Evolutionism* (Downers Grove, Ill.: InterVarsity, 1988), 132.

32. Howard J. Van Till, "When Faith and Reason Meet," in Michael Bauman, ed., *Man and Creation: Perspectives on Science and Theology* (Hillsdale, Mich.: Hillsdale College Press, 1993), 155–56. Despite the value of Van Till's efforts, I wish to interject a disclaimer here

against any personal belief in Van Till's concept of a "fully gifted creation," a detailed account of which is found in J. P. Moreland and John Mark Reynolds, eds., *Three Views on Creation and Evolution* (Grand Rapids: Zondervan, 1999).

33. "Our understanding of a structure depends largely on the discovery of its *telos*, its purpose or end: In other words, what is it good for? . . . One comes to understand the structure or order via a discovery of finality, while mechanism divorced from finality is in some sense unintelligible." William N. Shea, *The Naturalists and the Supernatural: Studies in Horizon and an American Philosophy of Religion* (Macon, Ga.: Mercer University Press, 1984), 148.

34. Cramer, "The Entropic versus the Anthropic Principle: On the Self-Organization of Life," 135.

35. George N. Schlesinger, "The Anthropic Principle," *Tradition: A Journal of Orthodox Jewish Thought* 23, no. 3 (Spring 1988): 8. Similarly, "Here is the cosmological proof of the existence of God—the design argument of Paley updated and refurbished. The fine tuning of the universe provides prima facie evidence of deistic design." Edward R. Harrison, *Masks of the Universe* (New York: Macmillan, 1985), 248.

36. This is not to say that skeptical inquiries are to be rejected entirely; in epistemological moderation they may ultimately prove helpful, but metaempiricist concerns are not without warrant. Theologian Karl Rahner, while acknowledging the role that healthy skepticism plays in science, nevertheless exhorts naturalistic scientists not "to extrapolate in an all too facile way a total world view based on the conclusions of natural science" (*Theological Investigations*, vol. XXI, *Science and Christian Faith*, trans. Hugh M. Riley [New York: Crossroad, 1983], 17).

37. For a fascinating examination of these "connections and resonances" within nature, many of which may be described without appealing to anthropic parameters at all, see Frank Wilczek and Betsy Devine, *Longing for the Harmonies: Themes and Variations from Modern Physics* (New York: Norton, 1988). But these other kind of natural cosmic harmonies in no way detract from the weightiness of the cosmic coincidences. As anthropic theorist Joseph M. Zycinski declares: "Now when the period of fascination with empiricism has ended in science, reflection on the puzzling manifestation of the harmony of nature is necessary, a harmony which is revealed by, among other things, cosmological coincidences" ("The Anthropic Principle and Teleological Interpretations of Nature," *Review of Metaphysics* 41, no. 2 [December 1987]: 332).

38. John Polkinghorne, *Science and Creation: The Search for Understanding* (London: SPCK, 1988), 30.

39. Brandon Carter, "Anthropic Selection Principle and the Ultra-Darwinian Synthesis," in *The Anthropic Principle: Proceedings*, ed. Bertola and Curi, 50–51.

40. Gratton, "Metaphysical Outlooks," 103.

41. G. F. R. Ellis, "The Anthropic Principle: Laws and Environments," in *The Anthropic Principle: Proceedings*, ed. Bertola and Curi, 29.

42. Paul Davies, *The Cosmic Blueprint: New Discoveries in Nature's Creative Ability to Order the Universe* (New York: Simon & Schuster, 1988), 163.

43. When the universe is described in these terms, anthropic theorists often characterize the ACP as being too anthropocentric in character. On the other hand, some seem to glory in its anthropocentricity by virtue of its cosmic *telos*, a teleology that thankfully produced human beings. As Oddone Longo states: "There is no doubt that the anthropic

principle implies axioms of the teleological and anthropocentric type, and may in a certain sense be defined as the scientific formulation of an anthropocentric teleology" ("The Anthropic Principle and Ancient Science," in *The Anthropic Principle: Proceedings*, ed. Bertola and Curi, 18).

44. Along these lines, M. A. Corey is not advocating such a position, but his ideas about God's creative intellect and power are thought-provoking. As Corey relates: "The truly unfathomable degree of complexity found at all levels of universal reality also seems to be explicable only in terms of an all-knowing Intelligence. It just doesn't seem to be possible for a mindless product of chance to consistently produce instances of complexity that completely overwhelm our ability to understand them. It would thus seem that the origin of any complex process requires at least as much intelligence as it takes for that process to be understood by other intelligent beings. As long as we assume this to be true, it follows that the universe had to have been created by a universal power that is *infinitely* more advanced than we are at the present time, since the underlying details of the physical universe appear to be infinitely complex. The only being who is capable of such infinitely advanced creative tasks is God *by definition*." Corey, *God and the New Cosmology*, 257.

45. "Why should it not be claimed that reason and experience at present confirm the hypothesis that some event of the past was due to the direct (primary) causality of God rather then to any derivative (secondary) cause or causes?" Hugo A. Meynell, *The Intelligible Universe: A Cosmological Argument* (Totowa, N.J.: Barnes & Noble, 1982), 109. With some revision of what primary and secondary causal sources involve, Arthur Peacocke writes similarly: "We must conceive of God as creating within the whole process from beginning to end, through and through, or he cannot be involved at all. It is not so much a question of primary and secondary causes, as classically expounded by Thomas Aquinas, but rather the natural causal creative nexus of events *is* itself God's creative action. It is this that the attribution of immanence to God in the creation of his world must be taken to convey. . . . We wish to say that all that is in its actual processes is God manifest in his mode as continuous creator" ("Theology and Science Today," in *Cosmos as Creation*, ed. Peters, 34).

46. At the volitional level, not every theologian, philosopher, or scientist will champion the ACP as fertile ground for theistic ways and means. In the context of twenty thought-provoking questions concerning fine tuning arguments as a whole, Jay W. Richards states that "if someone does not think it possible that the universe is fine-tuned, or does not think any observation or inference from, say, physics, could provide evidence or grounds for believing the same, then no argument is going to matter" ("Some Preliminary Questions to Any Future Fine-Tuning Argument," *Philosophia Christi* 7, no. 2 [2005]: 375).

47. Gerhard Staguhn, *God's Laughter: Man and His Cosmos*, trans. Steve Lake and Caroline Mähl (New York: HarperCollins, 1992), 155.

48. "One of the main reasons it is so tempting to supplant the [naturalistic] anthropic principle with its theistic interpretation is that this interpretation provides a much more coherent view. . . . The proposed anthropic process at work in the universe can be seen, not as some mysterious, unjustifiably proposed tendency, but as just another intentional product of the Creator's actions." Patrick A. Wilson, "The Anthropic Cosmological Principle," Ph.D. diss. (University of Notre Dame, 1989), 191.

49. *Canonical* is used here to mean "approved," because it is difficult to imagine another authorized used of the word *cause* beyond the six discussed, and *conjugates* is used to mean words that have related meanings.

50. Jaki, *Cosmos and Creator*, 97.

51. Definitions provided by Sproul, *Not a Chance*, 197.

52. As cited in Barrow and Tipler, *The Anthropic Cosmological Principle*, 49.

53. See Robert Audi, ed., *The Cambridge Dictionary of Philosophy*, 2d ed. (New York: Cambridge University Press, 1999), 125, s.v. "Causation," by Jaegwon Kim.

54. Jaki, *Cosmos and Creator*, 107–08.

55. Ernan McMullin, in Robert John Russell, William R. Stoeger, and George V. Coyne, eds., *Physics, Philosophy, and Theology: A Common Quest for Understanding* (Notre Dame: University of Notre Dame Press, 1988), 74 (emphasis original).

56. The present article is an abridged and amended version of chapter 3 of my doctoral dissertation: *A Christian Analysis of the Anthropic Cosmological Principle as the Basis for a Constructive Theistic Quantum Cosmology* (Fort Worth: Southwestern Baptist Theological Seminary, 1995).

Chapter 9 Notes

1. See Bas C. van Fraassen, *Laws and Symmetry* (Oxford: Clarendon Press, 1989), 1–14.

2. René Descartes, *Principles of Philosophy* (1644), part II, xxxvi.

3. Charles Hodge, *Systematic Theology*, 3 vols. (New York: Scribner's Sons, 1871; quotations from 1891 edition), 1:618.

4. Hodge, *Systematic Theology*, 1:607.

5. See Owen Thomas, ed., *God's Activity in the World: The Contemporary Problem* (Chico, Calif.: Scholars Press, 1983), 3.

6. Friedrich Schleiermacher, *The Christian Faith* (Edinburgh: T&T Clark, 1928), secs. 46 and 47.

7. Gordon Kaufman, "On the Meaning of 'Act of God,'" *Harvard Theological Review* 61 (1968): 175–201. Reprinted in Thomas, ed., *God's Activity in the World* (Note: page references are to the reprint), 153.

8. Kaufman, "On the Meaning," 148.

9. Kaufman, "On the Meaning," 156.

10. Kaufman, "On the Meaning," 157.

11. Owen Gingrich, "Where in the World is God?" in Michael Bauman, ed., *Man and Creation: Perspectives on Science and Theology* (Hillsdale, Mich.: Hillsdale College Press, 1993), 209–29; quotations on 220–21, 222.

12. Gingrich, "Where in the World is God?" 223.

13. Robert T. Pennock, *Tower of Babel: The Evidence against the New Creationism* (Cambridge: MIT Press, 1999), 30–31.

14. Phillip E. Johnson, *Darwin on Trial* (Downers Grove, Ill.: InterVarsity, 1991), 127.

15. See Carl Hempel, *Aspects of Scientific Explanation* (New York: Free Press, 1965).

16. Jaegwon Kim, "Causation," in Robert Audi, ed., *The Cambridge Dictionary of Philosophy* (Cambridge, Cambridge University Press, 1995), 110–12: 112.