Is Providence Plausible in Light of Modern Science?

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Abstract

This paper is a discussion of providence in light of current scientific knowledge. Specifically, it addresses the question of whether it is scientifically plausible that providence actually exists as a method through which God(s) might influence events and the course of history. It begins with a brief discussion of historical perspectives on providence and how they were affected by classical, or Newtonian, physics. Then, two scientific models which render providence plausible (one involving a conjunction of quantum mechanics and “chaos theory” and one involving only chaos theory) are presented and discussed in detail. Finally, there is a short discussion of some theological and philosophical implications of these models.
A soul mate is found unexpectedly. A cancer-ridden child, on whose behalf hundreds of desperate prayers were offered, makes an improbable recovery. A sea parts, allowing the survival of a nation which would one day give rise to one of the most influential people and religions the world has ever known. Believers in “the power of God” or “the power of prayer” would like to think that deity has a hand in these and similar events. The relevance of God’s actions in the course of history on both the detailed and grand scales is central in the faith of millions, if not billions, especially in our familiar Western, Christian tradition. But it is not that simple. Through investigation of creation itself, humans have assembled a picture of the world which has called into question the mechanism and, at times, even the possibility of God’s providence. Many claim to disprove God’s very existence, or at least God’s relevance, by showing providence to be unnecessary or impossible. The following examination of the subject will entail a brief introduction to various historical theories of providence, followed by an investigation of two very specific ways in which providence may be shown to be plausible, and finally a short discussion of the resulting implications.

Throughout Christian history until the advent of modern science and the Enlightenment in the 17th and 18th centuries, providence was taken for granted and unchallenged as a reality (Peters 81), much as the literal interpretations of the creation account and other stories in the early chapters of Genesis were taken for granted before sciences such as evolution and geology began to raise concerns. Discussion about providence did not concentrate on its existence but rather its mode of application. Did God act through uniform influence on all events, rendering humans the agents who, by their subjective response, made some events relatively more significant (“uniform” or
“general” providence)? By contrast, did God also actually and personally respond and act in specific situations (“objective” or “special” providence)? Such discussion changed in character when Newtonian physics, or physics at the macroscopic scale and slow speeds that humans see and know, caused many to doubt the viability of providence. They doubted because science portrayed a world whose events were causally closed, and did not leave room for interpretation. Reductionist materialism began when some thinkers extended the epistemological determinism (the single possible course of events dictated by universal law, according to scientific theory) of Newtonian physics to ontology (actual reality), thus creating a metaphysical view of the universe for which extra-material influence was nonexistent. Each situation seemed to have only one possible outcome, and events followed one another in predictable patterns which suggested a universe devoid of a need for any oversight by God. “Every indication coming from scientific research was that we did indeed live in such a physically deterministic world” (Barr 174). Among the ranks of the materialists were the French mathematician Pierre-Simon Laplace, who posited that “the natural world [is] a mechanistic, unfree, unbroken web of causal connections, and so is entirely predictable to the great divine mathematician whose calculations are not limited by practical considerations” (Russell et. al. 75), and the molecular biologist Jacques Monod, who stated that “man at last knows that he is alone in the unfeeling immensity of the universe, out of which he emerged only by chance” (McKay 2).

There were several theological responses to the metaphysical implications of deterministic physics. Many religious philosophers, such as Immanuel Kant (Peters 81), retreated into the world of the subjective, relegating God’s relevance to a life of faith and
personal devotion, but this seemed to reinforce God’s apparent lack of physical relevance. David J. Bartholomew, in his book *God of Chance*, suggested that God works only through divine influence on people (Polkinghorne 72), but this would mean that he was a spectator through most of the universe’s history, in which humans did not yet exist. Grace Jantzen suggests in her book, *God’s World, God’s Body* (Polkinghorne 72) that God is embodied in the universe, but this would mean that God is subject to the temporal and changing nature of that universe. Ian Barbour championed “process theology” (Polkinghorne 72), suggesting in short that events were the fundamental units of the cosmos and that God guided these to his ends, but this idea too seems vulnerable to determinism. Many others, among them thinkers such as Friedrich Schleiermacher (Polkinghorne 72), emphasized God’s primary role as Sustainer of creation and its governing laws, both of which would slip into chaos or non-existence without God’s continuous providence. Philosopher Donald McKay states: “…the scientific game of linking events into causal chains can and indeed should proceed without bringing in God as one of the links in the chain” (McKay 18), because the chains obey laws which God defined and is holding in existence. Certain passages in the Bible gave support to this view, such as Col 1:16-17: “… all things were created in [Christ] and for him. He is before all things, and in him all things hold together.” Also, Heb. 1:2-3 states that Christ “reflects the glory of God and bears the stamp of his very nature, upholding the universe by his word of power.” The Psalmist even seems to praise God for the stability of the Earth and the reliability of the normal links between events upon which our rational expectations are based (Psalm 93:1; 104).
This “sustenance view,” of course, fit well with uniform providence, but did not seem to allow for “special” providence, that kind of providence which is implicated in the personal answering of prayers or the working of miracles, such as the “mighty acts” of the Bible. These acts require that God influence the course of events so that they lead to a different result that that which would have been reached had God not engaged in the providence. If God’s creation was indeed governed by physical laws, which He set in motion and which only allow for one train of events in history, then God’s intervention would seem necessary for special providence to take place. The philosopher Langdon Gilkey expresses this concern: “For those of faith, the act of God must be objectively or ontologically different from other events. Otherwise, there is no mighty act, but only our belief in it” (Gilkey 197). Donald McKay states it another way: “To ask God for something could only make sense if we expect him to break with scientific precedent on our behalf” (McKay 52). This, in theory, is perfectly consistent with an omnipotent Creator, as McKay states:

“If a God who holds in being a dynamically stable world has reason to bring about a unique and unprecedented event, he could do so as easily as you or I could change the pattern of an artificially created sequence on a TV screen, quite regardless of the regularity with which precedent has been observed in the past” (McKay17).
However, the idea that God violates his own laws is “rather ugly and philosophically unsatisfying” (Barr 181) to many, and seems like rationalization in light of the fact that no such violations have ever been historically or scientifically documented, with the notable exception of religious texts. Is God, then, barred by his own laws from special providence, discrediting much of the theological base of Christianity? Perhaps not. In his essay “The Metaphysics of Divine Action,” John Polkinghorne, referring to the materialists’ metaphysical assumptions that physical determinism is universal, suggests that “their total adequacy is an untested hypothesis” (Russell et. al. 148). In his essay “Does the ‘God Who Acts’ Really Act in Nature?” Robert John Russell states: “It cannot be stressed too strongly that the cause of this perceived linkage between objective special providence and intervention was the combination of mechanistic physics and reductionist philosophy” (Peters 83). It would seem, then, that determinism warrants a closer examination before God’s providence is written off. To this end, Nancey Murphy states in her essay “Divine Action in the Natural Order:” “the problem of divine action is, at base, a metaphysical problem - one that cannot be solved by anything less radical than a revision of our understanding of natural causation” (Russell et. al. 326).

Further investigation reveals that a challenge to determinism has existed for about three quarters of a century. Quantum mechanics, in Kuhnian fashion, arose around the years 1910 to 1930 from the inapplicability of classical physics to behavior on the subatomic scale (Peters 86), which is completely outside human experience. It did indeed revise our understanding of natural causation. Quantum mechanics states that there is a fundamental limit to our knowledge about the state of the universe, and that beyond this limit we can describe events only using “probability waves” (Barr 176). The key
difference here between classical physics and quantum mechanics is in their statistics. Classical physics uses statistics purely out of convenience, in order to construct simplified and streamlined physical models which approximate natural situations. This method avoids more accurate but more complicated and tedious models. Theoretically, if all relevant information is known about a system to which classical physics is applicable, its behavior is perfectly predictable. In Quantum mechanics, however, statistics are permanent, necessary, and intrinsic. A good example is the decay of radioactive elements into smaller, more stable elements. It is known that, given a large population of such atoms, that the proportion of decayed and non-decayed atoms may be predicted accurately at any given time. This proportion over time follows an inverse exponential curve. But it is impossible to predict the quantity of time necessary for any one atom to decay. Only probabilities may be assigned to its behavior.

However, this description of quantum mechanics yields only epistemological (theoretical) indeterminacy. How can it be said with absolute certainty that a limit on our predictions corresponds to the breakdown of determinism? The answer is that it cannot. There are several ontological (relating to actual reality) interpretations of quantum mechanics. The most popular interpretation, known as the “Copenhagen” or “traditional” interpretation (Rolston 49, Barr 245) is that the epistemological uncertainty suggests an ontological indeterminacy; there is an inherent openness to events at the subatomic scale. From this perspective, the inference can be made that there exists more than one possible outcome for any given subatomic, natural situation. In other words, there exists (much) more than one possible chain of events, and all would be consistent with the known physical laws. This interpretation is fundamentally inconsistent with determinism. The
universe is causally open and includes an intrinsic randomness, at least at the subatomic scale.

Other interpretations, however, do exist. One is the “hidden variables” theory, which Einstein himself preferred (Barr 246). Because quantum probability waves portray some outcomes as more probable than others, hidden physical laws are at work, and determinism is preserved. This view was largely discredited in 1982 by Alain Aspect’s experiments (Barr 247). Another interpretation is David Bohm’s “pilot wave” theory, in which “A hidden wave guides the perfectly determined motion of purely physical particles” (Russell et. al. 148). The “Probability amplitudes” of quantum statistics are replaced with a conventional force-field, again preserving determinism. Most physicists reject this theory on the bases that it is irreconcilable with relativity and more artificial and complicated than the traditional interpretation (queue Occam’s Razor) (Barr 248). Another major interpretation is Hugh Everett’s “Many-Worlds theory:” “the perfectly deterministic Schrodinger equation controls all that is, but its [multiple] consequences are spread between parallel universes, not simultaneously open to human observation” (Russell et. al. 148). This interpretation is seen as more elegant than the Copenhagen because all possible outcomes occur, removing many of the traditional interpretation’s paradoxes about how and when a specific outcome is realized. The major objections to it are still in active dialogue (Barr 249-52). It is the major competitor of the traditional view and, if it becomes the victor, will be consistent with determinism. It will not prove it, however, because another metaphysical assumption, namely the infinitude of unobservable other universes, will have to be made in place of the largely vindicated assumption that determinism is universal. Scientists today, however, have good reason to
accept the traditional view. This reason is expressed by John Polkinghorne in his essay “The Metaphysics of Divine Action:” “Heisenberg’s original discovery was epistemological… very shortly he and almost all other physicists were giving the principle an ontological interpretation. It was treated as a principle of actual indeterminacy, not mere ignorance” (Russell et. al. 148). He says this is because scientists naturally expect a connection between epistemology and ontology: “They believe that they are learning about the actual nature of the physical world that they investigate.” If one accepts this interpretation of quantum indeterminacy, then, divine providence becomes much more plausible indeed. This view is expressed by William Pollard in his book _Chance and Providence: God’s Action in a World Governed by Scientific Law:_

“May not agents, human or divine, act in the physical world by a power to determine the outcomes of individual indeterminate quantum events, even if the overall statistical pattern of many such events may still be expected to lie within the limits of probabilistic quantum laws?” (Russell et. al. 152)

However, one major problem yet remains if one wishes to account for the possibility of divine providence with quantum indeterminacy. This problem becomes clear with an explanation of probability by Sherwin W. Chalmers in his _Introduction to Quantum Mechanics:_ “The result of any individual [probabilistic situation] cannot be predicted, but the total number of successes in a given large number of operations can be predicted with
considerable accuracy” (Chalmers 19). Probability always breaks down at the small scale (One can never predict the outcome of an individual situation using probabilities). However, large-scale probability (many occurrences) is very accurate and predictable. Billions of quantum events, when combined, form very regular and predictable patterns which we call laws. The world of classical physics, which is deterministic in nature and very accurately describes events at the macroscopic level of human experience, is the manifestation of quantum physics. This presents a problem which Holmes Rolston explains clearly: “Indeterminism in the atomic world may have no import for our native ranges of experience. Any uncertainty will always be statistically masked out… Thus, a macro-determinism remains, despite a micro-indeterminism” (Rolston 50). He uses the example of atomic clocks, which are accurate to the millionths of a second because of the reliability of large-scale quantum probabilities. How, then could quantum mechanics interact with the macroscopic world so as to give it relevance? Rolston offers one possibility: some macroscopic processes involve interaction with the microscopic world, and involve these interactions in the eventual definition of their outcomes. Rolston uses the example of random mutations in evolution, the mind, irreversible thermodynamics, the weather, and the early universe. Some of these systems are commonly referred to by others as “chaotic.”

A process is chaotic when its behavior appears wild and random because of its hypersensitivity to minute changes in one or more of its variables. These minute changes may precipitate radical fluctuations in the final result. Those processes falling under the umbrella of “Chaos theory” are traditionally portrayed as deterministic in principle because, while statistics and probability are used to describe them, they are assumed
unnecessary. It is thought that, if enough information is known about the exact state of the system, the chain of events will be predictable. However, if some of the variables in a particular chaotic process are microscopic in scale, could quantum indeterminacy not play a role by potentially minutely disturbing one or more of those variables? In the study of Chaos, *Chaos and Complexity: Scientific Perspectives on Divine Action*, Robert John Russell discusses the nature of chaotic systems:

“Chaotic randomness is neither absence of randomness nor strict randomness but a tertium quid. Whereas it might once have been supposed that predictability and unpredictability were directly opposed, chaos theory opens up a nether-world in which this supposedly sharp distinction is blurred to the extent that a particular kind of unpredictability (eventual) occurs in the context of predictability-in-principle. We are thus justified in speaking of a more or less unforeseen, albeit weak, type of randomness, namely chaotic randomness” (Russell et. al. 76).

Chaotic randomness could be said to be weak in the sense that randomness (quantum indeterminacy) influences a very small fraction of the variables in the system. However, this randomness is amplified from the microscopic scale through the system to make large differences in outcomes at the macroscopic scale (eventual unpredictability), and that is exactly what is needed to complete a viable model of intelligent agency through quantum indeterminacy.
The prominent science philosopher John Polkinghorne, however, takes a different view of Chaos theory which enables it to independently account for providence (and free will, together referred to in general as “agency”). Polkinghorne dislikes the quantum indeterminacy model because of the “measurement problem” (beyond the scope of this paper; see “Schrodinger’s Cat”) and because the extent to which quantum indeterminacy may be reconciled with chaos theory is unknown (Russell et. al. 152). He believes that the commonly accepted determinacy of chaotic systems breaks down when these systems are examined in their true, inisolable context. Some equations describing the behavior of chaotic systems, such as the Liouville equations (Polkinghorne 66), yield smooth, apparently deterministic curves when under the assumption of isolability (ability to work independently of variables in their environments and settings). However, their behavior changes dramatically when this assumption is removed, and the results are more like fractals, suggesting “possible behaviors that are not reducible to a sum of localized specific trajectories, and thus the possibility of agencies of an holistic and purposeful nature in the world.” His metaphysical proposal replaces the infinitesimal physical disturbances to which chaotic systems are so sensitive “by a causal agency operating in the openness represented by the range of possible behaviors contained within the ‘monoenergetic strange attractor’,” which he defines as “the envelope of possibility within which the future motion [of a chaotic system] will be contained” (Russell et al. 153). This new agency must have a holistic, “top-down” character because of the inisolability of chaotic systems. He dubs this scheme “contextualism” because it “supposes the behavior of the parts to be influenced by their overall context.” This model of providence, then, would operate in a very similar fashion to the quantum
indeterminacy model, but would stress the interconnectedness and holistic nature of the universe. However, though these models work well in their present state, it is important to keep in mind the theoretical state of humanity’s knowledge in the areas of quantum mechanics and chaos theory. Our knowledge about many aspects of these fields is very incomplete, as Polkinghorne admits:

“Of course, with present ignorance, it is no more possible for me to spell out the details of the subtle and supple physical reality I propose than it is for the physical reductionist to spell out how neural networks generate consciousness, or for those who rely on quantum indeterminacy to spell out how it generates macroscopic agency, or for those who rely on an unanalyzed notion of top-down causality through “boundary conditions” to spell out how it actually operates. We are all necessarily whistling in the dark” (Russell et al. 155).

Many of the theological implications of these two models of providence are coincidental with the predictions of Christianity and other religions. They support the view of God as sustaining the cosmos in “continuous creation,” as opposed to the view of God as an idle spectator or an interventionist. The predictable aspects of natural processes can be said to reflect God’s faithfulness (Polkinghorne 72). In addition, the holistic agency of both man and God will be hidden in unpredictabilities and will have to be accepted on faith. This result is reminiscent of 1 Cor. 3:19, “The wisdom of man is
foolishness to God,” which is suggestive of the immovable knowledge boundary (uncertainty) which is surely absent for the Creator. The Old Testament as well contains a few references which become intriguing in the light of these two models, such as the several instances of the casting of lots (Proverbs 16:33), in which God may be seen as manipulating a chaotic situation (either the physical objects or even the subconscious quantum mental processes influencing the caster’s motions) to make His will known, or the several passages in which control of specific climactic events are attributed to God’s providence.

But is all this any proof of God’s Providence? One field which provides for some interesting insight into this question is that of biological evolution. The driving force of evolution is random gene mutation, on which natural selection acts to change the philogenetic (physical) traits of a species over time. If these mutations arise from ontological indeterminacy, as has been suggested (Russell et. al. 141), then there exists a possibility for God to influence the trajectory of evolution, a possibility with attractive theological implications. However, it is well known that most mutations have no effect on either the mutant or its progeny, and that many mutations are actually harmful. This raises an interesting question: does God determine the outcome of every ontologically indeterminate event, or only a portion? This question has implications for a deeper question: can the universe “handle” undefined parameters? If ontological indeterminacy really means the breakdown of natural causality, then can events emerging from an ontologically indeterminate situation happen without additional definition? If the answer is no, then it would be necessary for God to define every outcome and, by application, every gene mutation. This creates problems because of the presence of “natural” evil;
evolution is commonly referred to as “red in tooth and claw” because of its dependence on (often painful) death through disease, starvation, predation, etc. All coincidences, accidents, and destructive natural disasters would have to be attributed to God as well. The once-promising indeterminacy becomes divine determinism (Peters 94). This is the view taken by McKay and other theologians: “An event appearing to be indeterminate by present precedent and theory is actually determined by the power of God. There are no truly random events (events released from the sovereignty of the Creator)” (McKay 31). This would appear to do away with free will (although perhaps those “made in God’s image” also have the power to define events within their own brains in order to determine their own actions). However, if one does not ascribe all indeterminate outcomes to God, then some events do indeed occur with a truly random and undefined nature. This alleviates the undesirable divine determinism, but allows the universe to run somewhat “independently” of God, and means that all quantum indeterminacies are ultimately decided by true, pure chance and nothing more. This presents a problem because, if God is not needed to define some outcomes, then why is God necessary to define any outcomes? Ontological indeterminacy and Chaos theory create a framework for the understanding of God’s providence as real and non-interventional, but do not provide a convincing proof of God’s Providence. This is not surprising, as it is obvious that in using quantum indeterminacy and chaos theory to create a plausible model of providence, one is making the same kind of metaphysical assumption (choosing one of several possible interpretations of quantum mechanics, or extracting implications from as-yet poorly understood Chaos theory) that the materialists use to refute the reality of God and the supernatural in general. One’s worldview is crucial in the acceptance of any
metaphysical argument, as stated by John Robert Russell: “One could say that we are presented with a choice between naturalism and theism: the same evidence from science is available, but the choice of presuppositions is crucial” (Peters 89).

Therefore, even though quantum indeterminacy and Chaos theory do not prove God’s providence is real, they do accomplish the original goal, which was to show providence as plausible and believable in the light of our current scientific knowledge. In the words of McKay:

“Indeterminacy does not in any straightforward way yield either function, purpose, or freedom... yet physics is, as it were, leaving room for what biology, psychology, social science, and religion may want to insert, those emergent levels of structure and experience that operate despite the quantum indeterminacies and even because of them. We gain space for the higher phenomena that physics had elected to leave out” (McKay 52).

In the end, “Motivation for belief in divine providence is found in the religious experiences of prayer and of trust in a God who guides” (Russell et. al. 155). The connection between quantum physics, chaos theory, and the plausibility of Providence provides for the believer not only an inspiring insight into the structure of Creation, but a necessary part of a defense of faith against materialists and others who say, “science disproves God”.

Bibliography


