

Science, Chance, and Providence

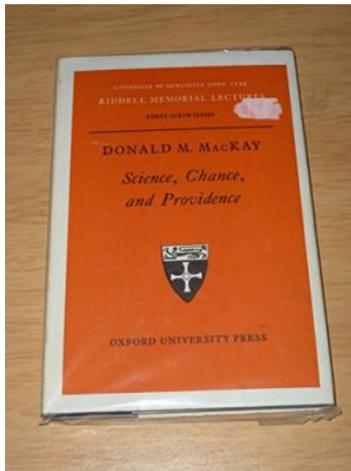
by Donald MacKay

(Oxford University Press, 1978)

Book summary by Erik Johnson

Introduction by Erik Johnson

My degree from the University of Washington (BA, '81) is in history with a special focus on the history of science. While attending the UW I was also employed as a youth pastor in a semi-fundamentalist church in Seattle. Consequently, the conflicts between science and faith, reason and revelation were topics of both great interest and great consternation. In the midst of my studies I discovered the wonderful little Intervarsity Press book called, **A Clockwork Image** by theistic scientist Donald MacKay. During those years of cognitive dissonance, I found that book of tremendous help.



Later, when in graduate theological school at Regent College, (MCS, '85) I found another delightful title by MacKay in the school library called, **Science, Chance, and Providence**. It was a small and densely written book which I never finished reading. I told myself to buy a copy someday and plow through it. This was the early '80s before the days of Amazon or Google but in the late 1990s I tracked down a copy on line for the astonishing price of \$100. I wanted it badly, but not for \$100 (especially for a book of only 64 pages). Recently I tried another Amazon search and to my delight found a copy for less than \$5. So now, after decades of waiting, I am happy to summarize **Science, Chance, and Providence** for my (and your) reading pleasure, thus saving you \$5 (or \$100, depending on what decade you live in).

Donald MacKay (1922-1987) was a British physicist, and professor at the Department of Communication and Neuroscience at Keele University in Staffordshire, England, known for his contributions to information theory and the theory of brain organization. He was also the author of hundreds of journal articles. You can find a bibliography by clicking this link.

http://www.asa3.org/ASA/articles/MacKay_bib.html.



Science, Chance, and Providence is comprised of MacKay's lecture notes delivered at the 46th Riddell Memorial Lectures at the University of Newcastle upon Tyne on March 15, 16, and 17, 1977. In the book he describes himself as "*one who has been nourished for much of his happy lifetime in both science and the Christian faith*" (p. 2). He believes neither science nor Christianity

deserve the ill repute heaped upon them. What follows is my summary of his lectures wherein he attempts to reconcile science and Christianity.

Preface: *“The argument of these lectures is that the harmonious relationship between science and Biblical theism is as natural and normal today as in an earlier age, and the conflict can arise only when key biblical emphases are distorted or forgotten.”*

PART I¹

1. **Fog.** *“Science in our day [1977] is under something of a cloud...a fog of confusion”* (p. 1). Some people disparage science because it’s responsible for pollution of both the environment and the human spirit. On the other hand, others disparage Christianity for a variety of reasons. Arnold Toynbee, for example, blames Christianity for de-deifying nature and thereby unleashing humanity’s greed and exploitation. Toynbee’s solution is a return to pantheism and nature worship. This will, Toynbee suggests, give humans restraint in their dominion over nature. Jacques Monod advocates entirely abolishing all traces of theism (what he calls *“animistic thinking”*), and says humans should accept the fact that we are alone in an unfeeling universe and the result of chance. MacKay says, despite the widespread belief that there are *“irreconcilable contradictions”* between faith and reason, Christian belief and science deserve to go together, like *“root and fruit”* (p. 3). *“Instead of starting with the scientific world picture as a given thing, solidly established on unchallengeable foundations, and then later asking what room is left for particular religious claims, it will serve our purpose better to ask first what it is that Christians believe our Creator told us about the nature of our world.”* (p. 3-4).² He’ll go on to argue that reason and faith can be harmoniously integrated and that contradictions are but an illusion.
2. **Dynamic Stability.** Christians, says MacKay, believe A) the universe is not eternally self sufficient but the result of God’s creation. B) The universe depends on God’s daily, continual, sustaining power. It needs divine power to keep it going; it is not self running or self contained. He writes, *“The stable existence of our world depends on the creative activity of God”* (p. 5-6). Just as the electronic sparks on a TV screen form a coherent pattern because of the way they were programmed, the universe operates the way it does because of a divine programmer. *“Any stability the picture has is a dynamic or contingent stability, conditional on the maintenance in being and the coherence of the succession of event giving signals”* (p. 6). Matter is not frozen or still but abuzz with swirling, vibrating atoms (p. 6). Objects that appear stable (chairs, tables, rocks) are in fact dynamic on the atomic or subatomic level. The *“stable”* image on a TV screen depends on *“dynamic”* electrons falling into coherent patterns. *“From the Biblical standpoint, all the contents of our world, ourselves included, have to be ‘held in being’ by the continual exercise of God’s sustaining power”* (p. 7). *“The only solid reality is God and what God holds in being”* (p. 9).

¹ This book is well organized and the outline and headings that follow are taken directly from MacKay's outline.

² Alert readers will see that MacKay is taking a pre-suppositional approach in his apologetic. He "pre-supposes" the truth of Christianity and then will ask how reality coheres with it, rather than offering scientific evidences for faith or the truth of Christianity. He offers no rational or empiric proofs or warrants for belief but simply offer reasons why the theistic presupposition leads to good outcomes.

3. **Science in a created world.** If the universe is, as Christians believe, coherent and dynamically stable because of God's creative will and sustaining power, then we should be interested in recognizing and responding appropriately to life's twists and turns. And we'd be eager to see things like the regularity of days (night and day) and years (seasons) as tokens of God's stability, creativity, and faithfulness. The Bible writers did so, says MacKay, and so do theistic scientists. He calls attention to the scriptures about "subduing" the earth, not with greed or exploitation as Toynbee fears, but with gratitude, responsible stewardship, and reverent admiration for its Giver.

4. **Customs of the creator.** Empiricism "works" say MacKay because nature and humanity are sustained by a God who is dependable, faithful, and orderly. "*So our theistic scientist would certainly have an incentive at least to look for, if not to predict, a corresponding orderliness in the pattern of observed events in the created world*" (p. 12). There are two kinds of regularities in nature. 1) Co-occurrence [night follows day, summer follows winter], 2) causality [crop failure follows drought, intoxication follows overindulgence in alcohol]. Scientists look for the mechanisms behind these correlations and call them, "*laws of nature.*" Science therefore can often describe and prescribe (predict) what will happen (eclipses, weather, etc.). "*In effect, to explain something scientifically means to show that it ought not to have surprised anyone who knew the initial conditions and the general customs of the Creator*" (p. 13). "*Scientific laws do not make things happen*" (p. 13), but describe the way things happen, and predict how things will happen on the basis of research. Doing so is, from a Biblical point of view, "*an act of stewardship*" (p. 14).

5. **Two questions.** 1) If events require prior events (initial conditions, precedents) for them to occur, is God bound by precedents? No. God not bound by precedents; he is sovereign and free. God "*encourages us to believe that his sustaining activity actually has both structure and purpose, some of it intelligible enough to be grasped by even our finite minds*" (p. 14). 2) Aren't scientific explanations an alternative to religious explanations? Again, MacKay says no. God is not a link in the causal chain but rather, "*God is the giver of all events*" (p. 15).³ Scientific explanations do not warrant disbelief in a Creator. The fact that I put Christmas presents under a tree does not prove Santa doesn't exist⁴. Just as "*finding a causal connection between the impact of the 'bat' and the motion of the 'ball'*⁵ in the television tennis game eliminates any need for the black box as the sustainer-in-being of the whole show" (p. 15).

6. **Miracle.** Because God sustains all events in the universe "*every natural event is a miracle*" (p. 16). Some miracles have precedent (identifiable causes) like the "natural" winds that dried up the Red Sea under God's sovereign timing. Other miracles are without precedent: IE., the resurrection of Christ. Miracles are events that 1) depart from the ordinary, and 2) communicate God's personal concern. God can choose, says MacKay, to bring about events

³ What warrants belief in the hypothesis that "God is the giver of all events?" Theists have the burden of proof for warranted belief, which MacKay does not provide.

⁴ This is MacKay's unhelpful analogy. First of all, it of course begs the question, "If a scientific explanation accounts for phenomena why believe in God at all?" Secondly, the burden of proof for believe in God [or Santa] rests with theists.

⁵ MacKay is apparently citing the (at the time) new and novel computer game, Pong.

in irregular ways. MacKay has misgivings about the use of the nonbiblical word, "supernatural" since nature has no self-sustaining power independent of God (p. 18). Miracles are merely a "*change of mode of divine agency*" (p. 18).

7. **Objectivity.** Relativity theorists (quantum physicists), sociologists, and psychologists all suggest objective knowledge is unattainable. According to MacKay, such scholars say, 1) there is no one single description of the universe completely valid for all observers, 2) there is little distinction between the observed and the observer. But if all events have their being in one Creator, certainly He knows objective facts. MacKay cautions, don't confuse relativity with denial of objectivity.
8. **Conclusion.** Scientists who love the Creator welcome and seek explanations for phenomena. They love surprises in phenomena. And they recognize the coherence of phenomena as evidence of the Creator. Theistic scientists reject falsehood and embrace truth.

II. The Mythology of Chance

1. **The Unpredictable.** "*If you believe in a Creator who normally observes precedent in maintaining the dynamic stability of his world, it is worthwhile--indeed a matter of duty--to search out the regular patterns according to which events normally follow one another*"⁶ (p. 21). In other words, when theistic scientists adopt the presupposition that there is a Creator, they are inspired to study nature. While miracles are well-timed events intended to inspire awe, there is a "*margin of uncertainty*" (p. 22) about their predictions. To make predictions even more incalculable, especially on a microscopic level, atoms do not behave according to laws of matter on a macro level. There is an uncertainty principle in both the miraculous and quantum atomic theory. How then do we square chance events with God's providence?
2. **Clearing the Ground.** In this chapter MacKay offers definitions to clarify the meaning of different terms.
 - **Random process.** These are events that occur without our influence [such as the outcome of rolling dice].
 - **Random sequence.** These are the products or statistical outcomes of random processes, such as the sequences produced by tossing dice.
 - **Random sequence type 1):** those having no determining cause [trajectory of atoms, toss of dice].
 - **Random sequence type 2):** those having no discernable order [the last digit of a list of phone numbers on a page from the phone book].
 - **Indeterminacy.** This is an event that has no known determining cause (what MacKay calls "prior specification." The cause of the event is either nonexistent or it's completely unknown [the Big Bang].

⁶ I changed the tenses of his sentence without altering his meaning.

- **Unpredictability.** As the term implies, we can't always predict the outcome of an event [who will get in a fender bender today?].
- **Deterministic event.** This is an event that had a prior set of precursor events from which the event followed [a lunar eclipse]. *"The maintenance of precedent on which science depends was attributable to the stability and coherence of the divine upholding agency"* (p. 26).

Events that are determined by God's fiat (word) are either...			
Determined by precedent and are...			Undetermined by or contrary to precedent and are
Predicable in practice	Predictable in principle	Unpredictable in practice	Unpredictable in principle

3. **Chance.** The uncertainty principle is a statement about *"limits to our knowledge"* (p. 28-29) not about the absence of causal precursors. We shouldn't "solve" problems by *"refusing to recognize"* them (p. 29). MacKay believes that God is the causal precursor to all events. He also disapproves of the notion that determinate variables must be measurable to be meaningful. In other words, just because we can't measure God's providence doesn't mean it isn't real. He asks how well our view of life, the universe, science, nature, and causes, *"corresponds with what God knows we would objectively correct to believe?"* (p. 29). If we believe in a God who knows and sustains the universe then there is a huge difference between our epistemological uncertainty (lack of predictive knowledge), and ontological uncertainty (lack of determining causes). There is no rational ground for claiming that the absence of observable causal precedents means there are no causal precedents.⁷ *"The God of biblical theism is beholden to none to account for his creative agency. If he freely wills into being a succession of events in which one half of the sub-microscopic details at any time are unspecified by their precursors, this would involve no inconsistency with his character, still less with his sovereignty as portrayed in the Bible"* (p. 30).
4. **A Misstated Issue.** In this section MacKay interacts with biologist Jacques Monod's **Chance and Necessity** (1972). Monod states, *"Chance alone is at the source of every innovation, of all creation in the biosphere. Pure chance, absolutely free but blind, is at the very root of the stupendous edifice of evolution. This central concept in biology...is today the sole conceivable hypothesis, the only one compatible with observed and tested fact...Our number came up in the Monte Carlo game"* (p. 31). To summarize MacKay in my own terms, I believe he is saying that even if the universe, matter, and life, emerged without a prior precedent: this in no way contradicts the Bible. We simply don't know what the prior precedent was, other than God. According to scripture creation was 'ex nihilo,' out of nothing. *"Whether we as scientists would classify an event as 'chance' or as 'physically determinate' is of no concern whatever to the biblical writers, who would coolly assure us that God gives being to all events in both categories [by chance or determinate], and that he is sovereign equally over either category"* (p. 33).⁸ *"Certainly the concept of divine sovereignty in physical events as exemplified in the Bible has no quarrel whatsoever with a hypothesis that some of these events were extremely improbable by human*

⁷ By the same token, MacKay offers no rational grounds for belief in divine causal precedents.

⁸ This once again begs the question, "Why posit a God behind nature at all?"

reckoning" (p. 33). Chance, argues MacKay, is not an agent or a cause or source. *"It stands for the absence of an assignable cause"* (p. 34). When Monod personifies chance he makes an illegitimate switch from a *"scientific to a quasi-religious mythological concept"* (p. 34).⁹ To classify an event or process as random does not prevent recognizing the hand of God in it.¹⁰

5. **The winding down of the world?** In this section MacKay discusses the famous second law of thermodynamics. This law states, *"In a closed system the overall disorder must increase towards a maximum as time goes on"* (p. 36). Scientists measure the amounts of disorder and how the total energy of a system is distributed in an index called "entropy." The higher the entropy the more scrambled is the distribution of energy. Information scientists calculate entropy using 'bits' and algorithms.' The second law of thermodynamics has been invoked in two ways in the science/theology debate. 1) Anti evolutionist theologians (incorrectly it turns out) clam the evolution of highly complex life forms from simpler forms. This (they claim) contradicts the second law of thermodynamics. MacKay says that argument is flawed because *"the earth is not an isolated system. It receives a continual flood of highly ordered energy from the sun; and if one estimates the resulting increase in entropy (energy disorder) for the sun, this vastly outweighs any local reduction in energy disorder brought about on earth by biological processes, whether evolutionary or otherwise"* (p. 37)¹¹. 2) Astrophysicists predict the heat death of the universe (IE., the end of the world). But, argues MacKay, whether or not the universe is a closed system is beyond human comprehension and understanding. *"No existing evidence (some would say no conceivable evidence) can rule out speculations that the orderliness of the universe is continuously replenished, or even oscillates up and down over some long time scale"* (p. 38). *"The data of science leave entirely open the future course of the cosmic drama. The Second Law of Thermodynamics can do no more than assure us that a gradual winding down of the universe is one of the possible Last Acts. If the drama is actually held in being by a divine Author, of course, the Last Act may be different from our wildest imaginings"* (p. 39).
6. A chance event is one which defies determination or the basis of precedent. It is, "the unforeseeable," (p. 40). But even in the case of the most scientifically inscrutable event, theism can still persist. Nothing scientists know requires believers to quit saying, "God did it." Is the occurrence of any particular event due to the agency of God or chance? Theologians say, "God." If this is so, does this mean that humans are mere puppets in a divinely ordered world? This will be the focus of Part III.

⁹ Point well taken. "Chance" doesn't "make" things happen. Other than Monod, I'm not aware of any atheist scientists who personify chance in this way. Most use the term "chance" as, "No knowable precedent, cause, or determining factor." The pattern made when a cue ball "breaks" ten billiard balls is "chance," in that we can't plot the pattern ahead of time simply because we don't have enough information about trajectories, speed, angles, weight of balls, etc. No one [to my knowledge] says, "Chance as a causal agent determined the pattern on the pool table."

¹⁰ To believe in providence one simply slaps divinity on top of or behind natural processes. It is an act of faith neither verifiable or falsifiable. I know water boils at 212 degrees Fahrenheit *and* because I want tea. In the same way I can recognize laws of nature *and* slap a divine purpose behind it. I do so for emotional reasons.

¹¹ Take that, evolution deniers.

PART III. What Room for Providence?

1. **The Image of Space-time.** Christians believe, MacKay says, that God transcends space and time. This being the case, "*We must be prepared to admit our ability to think about God is limited*" (p. 42). MacKay poses two questions: 1) if God is to be pictured as an invisible inhabitant of our world how can we know Him? 2) and how, if we and our world have its being in him, how can we know Him? The answer to both questions is: God reveals himself to us in the events of the world. But since God himself exists outside of our four-dimensional world (space and time), how is this possible? Some analogies may help.

A. Authors live "outside" of the world of space and time they've created for the characters in their novels. Authors "transcend" their creation. Just as the characters of a novel have limited ability to think about the Author, humans have limited capacity to think about God the Author of space and time.

B. A two-dimensional drawing cannot adequately or completely depict a three-dimensional object. To represent a three-dimensional object (like a bridge for example) artists need to draft several two-dimensional drawings from several vantage points or different perspectives. So too, to "see" or experience God humans require a multi-dimensional approach, three perspectives on God. Theologians call this the Father, Son, and Holy spirit.

2. **What makes a contradiction?** "*Two disparate accounts from exactly the same standpoint cannot both be true*" (p. 47). MacKay offers several examples where "apparent" contradictions are resolved by taking into account "differences of standpoint."

A. When we hold our hands out in front of us and align our right finger behind our left thumb, it appears to the right eye that the finger is behind the thumb. But if you close your right eye and open your left eye, your right finger magically appears to the left of your thumb. Is your finger *behind* or *to the left of* your thumb? Both. Individually your two eyes can't both be right. But in stereo they create a three-dimensional image. Your eyes do not contradict each other but form a binocular image.

B. If you cut a piece of sand paper out of a sheet and superimpose (hold that piece over) the sheet of sandpaper it looks to each individual eye to be camouflaged. But looked at simultaneously with both eyes the image appears to be three-dimensional.

C. Magic Eye illusions work only when both eyes work in tandem. It's a hard mental/visual skill but it can be developed. If it's hard to train your eyes to see a Magic Eye optical illusion, how much harder must it be to "see" God.

"When you are confronted with a situation which has more dimensions than your descriptive framework, you must be prepared to accept and seek to integrate more than one description, from more than one standpoint, if you are not to miss some of the truth about the situation....Since the Being of God is a complete mystery to us apart from what he may disclose to us, our only hope of learning of its 'dimensionality' must be through careful and unprejudiced integration of any images he may offer us in human terms, being specifically careful to preserve the disparities between different images, as the chief source of clues to the 'depths' of what is to be perceived." Before trying to make sense of any statement about God, it is essential to identify as well as we can the standpoint for which it claims to be a valid 'projection'" (p. 44).

"If we are to do justice to what the biblical writers claim to be self-disclosures by God in various circumstances--to perceive what is there to be perceived in and through the data--then non only must we be patient of apparent disparities; we must also be prepared for some time to pass, and maybe much effort to be expended, before our perception beings to 'click.'" (p. 46-47).¹²

3. **The human face of God.** The Bible offers multiple views of God which, when seen individually, may appear at odds with each other. *"Disparities between such projections, if they are genuine, are to be welcomed as informative clues; but we need not expect to be able to resolve them into an integrated multidimensional picture just by thinking about them.... Our best hope of achieving some integration will be to absorb what we can of each projection when we ourselves are in the appropriate situation for that projection, and to avoid the mistake of trying to absorb a projection 'from the wrong angle'--i.e., in a situation for which that projection does not apply"* (p. 48). In practical terms this means seeing God as both transcendent (extra temporal) and in time (sustainer in the flesh).
4. **Prayer in a scientific age.** If the world follows a succession of reliable and predictable events where does prayer fit in? Why ask for anything to be different?
 - Do we expect God to break with science and precedent on our behalf?
 - If it is God's will won't we get what he wants whether we pray or not?
 - If God controls all, including our synapses, aren't even our prayers his doing?

MacKay's answers: these questions are problems only if we see God outside of time (one perspective). If we see God as in time the problems vanish (another perspective). *"The rational thing for those who love God to do when in trouble is to express their trust in this and related promises by praying for help, confident that if their Creator sees that good would be served by a positive response, he will have ordered accordingly events that may otherwise have no 'causal connection'"* (p. 55).

5. **A secular Illustration.** In this section MacKay tackles one of philosophy's more famous puzzles, **Newcomb's Paradox**. A quick Google search will reveal how nettlesome this problem is for serious philosophers, mathematicians, and game theorists. It has to do with speculative predictions of an omniscient gift giver. Which gift would you prefer: an envelope which contains X number of dollars (the amount of which depends on what the omniscient gift giver predicted you'd pick), cash, or both? It's much more complicated than this and fun if you have a free week for mind bending puzzles.
6. **The specter of the inevitable.** If God is in total control are we not mere puppets? MacKay says no. We are not puppets or "play actors" but rather, *"agents: conscious individuals whose behavior is (sometimes at least) shaped by and in pursuit of his own thoughts and purposes"* (p. 61).
7. **Contact with God.** In this final brief chapter MacKay summarizes his reconciliation of faith and science. In short (and this is my interpretation of MacKay), "There is nothing in

¹² This is as close as MacKay gets to the problem of evil (if that was even in his thoughts). Reconciling a sovereign God with suffering of the innocent takes time and much effort.

science or logic that would necessarily prevent one from having faith. I have successfully rebutted the arguments against faith." Whether or not he has succeeded I leave for you to decide.

Erik's Conclusion. Having a 40-year love affair with the doctrine of Providence I was delighted to swim in these waters once again. However, overall this book was disappointing for the following reasons: MacKay never mentions the Achilles' Heel of monotheistic providence: evil, suffering, and injustice. He never offers reasons why the providential Creator behind science is one and the same as the God of the Bible. And while he claims there are no scientific reasons not to believe in Providence, he offers no reasons to believe. Finally, for all the Bible quoting he does he omitted quoting the many mentions in the Bible of chance and randomness (in the wisdom literature).