

THEOLOGY IN GLOBAL PERSPECTIVE SERIES

Peter C. Phan, General Editor

CHRISTIANITY AND SCIENCE

Toward a Theology of Nature

JOHN F. HAUGHT

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Science and Christian Hope

Shatter, my God, through the daring of your revelation the childishly timid outlook that can conceive of nothing greater or more vital in the world than the pitiable perfection of our human organism.

—Teilhard de Chardin¹

CHRISTIAN FAITH IS ESSENTIALLY about the future—not simply a future beyond the world but also the future *of* the world. Of course, it is concerned also with the meaning of the present and the past, but what this meaning is can be fully revealed only in the future. Christian faith is above all a quest for the Ultimately New, and it hopes for the radical renewal of “the whole of reality,” not just human history.² Christians are called upon to extend their religious expectations beyond human preoccupations outward toward the entire universe and its future. Science can help them do so.

Science, as I noted in the preface, has exposed the three infinities—the immense, the infinitesimal, and the complex. But Christian faith had already opened up a fourth, the infinite horizon of the future. It is the Future beyond all futures that Christian hope seeks. The heavens may entrance us, but even in their staggering expansiveness we cannot find all that our hearts are longing for. The human spirit’s quest for final liberation leads beyond all present times and past all perishing, beyond this universe and any others, toward the Absolutely New—in other words, to God, the one whose promises open up all of life and all universes to an endless and unimaginable future. “Christian hope,” says theologian Jürgen Moltmann, “is directed towards . . . a new creation of all things by the God of the resurrection of Jesus Christ.”³ At the very heart of Christianity lies a trust that the world remains forever open to a new future. The name of this future is “God.” God, however, is not just any future

1. Pierre Teilhard de Chardin, “The Mass on the World,” in Thomas M. King, *Teilhard’s Mass: Approaches to “The Mass on the World”* (New York: Paulist, 2005), 150.

2. Jürgen Moltmann, *Theology of Hope: On the Ground and the Implications of a Christian Eschatology*, trans. James W. Leitch (New York: Harper & Row, 1967), 34.

3. *Ibid.*, 33.

that we dream up. The futures we conjure up and plan for ourselves are inevitably inadequate to what we really need. Rather, as Karl Rahner has put it, God is the *Absolute Future*, deeper and more surprising than anything we could possibly wish for ourselves. *Deus semper maior* (“God is always greater”).⁴

God is the “power of the future”⁵ that rises up to greet the universe anew at the place where each present moment passes away. Although we cannot grasp this elusive Future we can allow ourselves to be grasped by it. “The coming order is always coming, shaking this order, fighting with it, conquering it and conquered by it. The coming order is always at hand. But one can never say: ‘It is here! It is there!’ One can never grasp it. But one can be grasped by it.”⁶

Perhaps “future” is not the first idea that people today, including Christians, associate with the word “God.” The essential “futuraity” of God that shaped the biblical experience has for centuries hidden behind a fogbank that is only now, very slowly, beginning to dissipate. As the mists that had enshrouded the future begin to fade, we may still prefer not to expose ourselves to the wide vista that opens up ahead. The future that Israel, Jesus, and the early church felt to be dawning so dramatically, the “coming of God” that gave their lives a sense of adventure and unparalleled excitement, many of us would still prefer to hold at bay. The restlessness that accompanies exposure to the future is easily suppressed, especially if we are comfortable with the way things are right now.

And yet, even in the best of circumstances, at some level of our being we still long for a new future, even as we cling to what is past or present. A sense of the coming (*adventus*) of God stirs us up, makes us yearn for deeper freedom, for a more wide-open space in which to live. Yet, like idlers standing by in the market place, we remain tied to what is or what has been rather than to what will be. It is the destitute, those who now have nothing to fall back on, who are most open to the promise of a radically new world. It is their ears that the fire of the gospel first sings with the unsettling news of God’s coming.

4. Karl Rahner, *Theological Investigation*, vol. 6, trans. Karl and Boniface Kruger (Baltimore: Helicon, 1969), 59-68; see also Jürgen Moltmann, *The Experiment Hope*, ed. and trans. M. Douglas Meeks (Philadelphia: Fortress, 1975), 48.

5. Wolfhart Pannenberg, *Faith and Reality*, trans. John Maxwell (Philadelphia: Westminster, 1977), 58-59; Ted Peters, *God—The World’s Future: Systematic Theology for a New Era*, 2nd ed. (Minneapolis: Fortress, 2000).

6. Paul Tillich, *The Shaking of the Foundations* (1948; New York: Charles Scribner’s Sons, 1996), 27.

But how are we to connect the thought world of the natural sciences to the Christian revelation of a God who is coming and seeks to renew the world? If we are receptive to the gospel and serious about making sense of Christian faith today, we need to tie what science is telling us about the universe to Jesus' own infectious excitement about the coming of God's reign. The fervor of expectation aroused in his followers by Jesus and the news of his resurrection must be the framework of any truly Christian reflection today on the meaning of the entire universe as it is being laid open to us by the natural sciences. A Christianity that avoids reflecting on scientific understanding of what is going on in the universe is less than realistic. Christian faith needs to be not only consistent with what the sciences are saying but also eager to render more intelligible than ever the world that science has been setting before us. It is the purpose of this book to suggest ways in which science can influence and challenge Christian faith as well as how the light of faith can illuminate what we are learning from science about nature.

SCIENTIFIC SIMPLIFICATION

Can one worship the Christian God in an age of science? For many it is not easy. On the one hand, scientific *discovery* has made the universe appear larger and more complex than ever before—for many even larger than God. On the other hand, scientific *method* seems, at least at first sight, to make the world smaller than it really is. It can make the universe seem too simple to inspire a sense of mystery. Science's way of investigating is to break natural phenomena down into more elementary components or into earlier chains of physical causes. Likewise, scientific method deliberately blinds itself to what Pierre Teilhard de Chardin calls the "insideness" of things.⁷ Science looks at the world externally and objectively. It says nothing about value or meaning, and it misses completely the subjective world that each of us experiences interiorly. Moreover, science studies events in terms of *what has been* rather than what will be. Of course, it tries to make the future predictable, for unless science can make predictions, it does not qualify as science. But it can predict what will happen in the future only on the basis of what has already happened. By itself scientific method leaves little room for *new* being. On its own it is scarcely able to hear the strains of any dawning new creation. As I shall emphasize repeatedly, in harmony with one of Teilhard's most important

7. Pierre Teilhard de Chardin, *The Human Phenomenon*, trans. Sarah Appleton-Weber (1959; Portland, Ore.: Sussex Academic Press, 1999), 23-24.

principles, the world can become fully intelligible to us only as we look toward its future, not by looking only into its historical past or particulate makeup.⁸

Scientific method then is unable by itself to prepare the mind and heart for what is truly new. But Christian faith, as distinct from science, is *essentially* expectation of new creation, so its prescribed posture of hope may sometimes seem remote from the alleged “realism” of science. Christian creeds, doctrines, and theologies are not properly read unless they communicate the sense of expectation that gave rise to the faith’s earliest fervor about the coming of God. “We hope to enjoy forever the vision of Your Glory,” many of us pray during the eucharistic celebration, but how can we express such hope and at the same time accept what the sciences are telling us about the world? Christian hope implies that the world is not ultimately tied to endless repetition; yet in science everything must conform to timeless, hidebound routine. How then can we hold science and faith together without contradiction? This, it seems to me is a central question for theology today, and it will not go away simply by our ignoring it.

Unfortunately, Christian instruction can also easily anesthetize human minds against the invasion of the future. Theology has often represented the idea of God in concepts that deal best with what is, or what has been, rather than with what will be. God is usually pictured as the eternal, unchanging, and timeless mystery that grounds, creates, and now hovers over, or underlies, the world. Many Christians have grown comfortable with such vertical locations of deity, but these depictions of God, supported as they are by prescientific theological metaphysics, fail to capture the mood of expectation that haunted the earliest ecclesial gatherings.

It is doubtful that theology can be faithful to its calling as long as it fails to put us in touch once again with the *anticipatory* temper of Christian faith. But it is precisely the expectation of new creation that makes it so difficult for many scientists and philosophers to accept Christianity. Of course, there are also less important—and entirely unnecessary—reasons why the scientifically enlightened often disdain Christianity, as well as why many Christians snub science. We shall have ample opportunity to review these reasons later on. The point I want to make here is that for many scientifically educated people the *true* stumbling block to Christian faith is its belief that a new world is coming and indeed is already taking hold right now, transforming and renewing the *whole* of creation.

Scientific method is simply not equipped to see this happening. Science views the present in terms of what is earlier and simpler. Its sense of the future

8. *Ibid.*, 163: It is only in the future that “the past lines of evolution take on their maximum coherence.”

is shaped by a preoccupation with what has already taken place in strict conformity with the virtually timeless laws of physics and chemistry. Science, in other words, is not wired to see what is truly new. Genuine Christian faith, on the other hand, views things and events especially in terms of what is coming. Science is not wrong in looking to the past so as to understand the present, but its way of seeing the world is limited. If the world has room for a radically new future, scientific method is not perceptive enough to take hold of it. Christian faith, as I shall emphasize throughout, is essentially about what is coming, and about the God whose very essence is to be *future*, the inexhaustible font of renewal.⁹

Does this mean then that science and faith are incompatible ways of looking at the world? Not at all. Not only are they compatible, but a mutual engagement of the two perspectives can enrich the lives of all of us. Looking with science toward what is earlier-and-simpler is essential to appreciating the arrival of what is later-and-more. And a sense of the dimly dawning horizon of a later-and-more can give deeper meaning to what science sees in its survey of the past and present. This mutuality will prove especially significant as we try to understand the phenomena of emergence and evolution.

Science looks at the world by observing and generalizing from large numbers of similar events that have already taken place. Every falling object, for example, traces the same changeless path of acceleration that the Newtonian law of gravity specified several centuries ago. Every new species of life can be accounted for by looking back at how the invariant mechanism of natural selection has eliminated unpromising traits of organisms in the past. In this sense science abides no exceptions and no surprises. Scientific method focuses on initial physical conditions and the unchanging, deterministic laws operating in nature from age to age. Of course, it may occasionally discover habits of nature previously unknown, and it can formulate fresh hypotheses. But, at least as it has been understood for the past several centuries, science looks at things in terms of what has always been. To science, every future occurrence, no matter how strange, will be an exemplification of timeless laws and previous physical circumstances, so by itself science simply cannot see clearly the perpetual newness of creation. Even though dramatically new phases, or new kinds of physical activity, such as living and thinking organisms, have emerged at times in nature's long history, science tries to explain these "emergent" phenomena as much as possible in terms of the earlier habits of nature pertaining to nonliving and unintelligent physical processes.

9. Following Jürgen Moltmann, *The Coming of God: Christian Eschatology*, trans. Margaret Kohl (Minneapolis: Fortress, 1996).

There is irony here, for the actual *discoveries* of science, such as the Big Bang, the evolutionary trajectory of life, the genetic code, the Hubble Deep Field, and the chemical aspects of mind have in fact made the world new for all of us. In this sense science continually opens up a new future to human consciousness. Scientists, as human persons just like the rest of us, face their professional future in expectation of arriving at new insights. This anticipation energizes them and gives meaning to their lives. But when it comes to *explaining* new discoveries, science is typically limited to fitting them into what it already knows of nature's past patterns of occurrence.

Even new theories, at least until fresh information challenges the old, are made to fit into an established understanding of the laws of physics, or else they are not scientifically intelligible. Unless natural phenomena and processes can be simplified in such a way as to be mathematically intelligible, our understanding of them will not qualify as scientific. As the mathematician Gregory Chaitin puts it, "for any given series of observations there are always several competing theories, and the scientist must choose among them. The model demands that the smallest algorithm, the one consisting of the fewest bits, be selected. Put another way, this rule is the familiar formulation of Occam's razor: Given differing theories of apparently equal merit, the simplest is to be preferred."¹⁰

This reductive approach, once again, is not wrong. Methodologically speaking, science has every right to look at the world in a way that momentarily brackets out the impression of novelty. Much can be learned about nature by focusing in mathematical terms on the regularities it always obeys. And scientific explanation must be a legitimate part of any rich accounting for everything that goes on in nature, even intellectual, moral, and religious activity. The salient issue, however, is whether science can be the *whole* explanation.

In the intellectual world today, apart from scattered islands of postmodern dissent, there is a widely shared belief that science is enough to account fully for everything. "Scientific naturalism," as I shall call it, is the academically endorsed belief that science alone can take us down to the deepest and most fundamental strata of the world's being.¹¹ So it is not scientific method itself but *belief* in the unlimited explanatory scope of science that contradicts Chris-

10. Gregory J. Chaitin, "Randomness and Mathematical Proof," in *From Complexity to Life: On the Emergence of Life and Meaning*, ed. Niels Gregersen (New York: Oxford University Press, 2003), 23.

11. Apparently it was T. H. Huxley, Charles Darwin's famous "bulldog," who first used the expression "scientific naturalism." See Ronald Numbers, "Science without God: Natural Laws and Christian Belief," in *When Science and Christianity Meet*, ed. David C. Lindberg and Ronald Numbers (Chicago: University of Chicago Press, 2003), 266.

tianity and other religions. To Christian theology the sciences are important levels in an extensively layered hierarchy of explanations needed to account for anything. But science, since it leaves so much of the world out of its theories, hypotheses, and mathematical models, cannot provide ultimate explanations.

Theology, on the other hand, professes to instruct people about the deepest explanatory level of all. It looks for ultimate explanation, whereas science is limited to proximate ones. To theology, the ultimate explanation of nature and nature's laws is the creativity, love, power, and wisdom of God, the One who perpetually opens up a new future for the world. Scientific naturalism, on the other hand, assumes that science, at least in principle, can explain all things exhaustively and ultimately in terms of what has already been. In its belief that science alone can provide ultimate or final explanation, scientific naturalism in effect turns science into an alternative religion. And so it views theology as a rival rather than a friend of science.

If it is faithful to the biblical vision, theology for its part may find it necessary to cultivate what may be called a "metaphysics of the future."¹² From a Christian point of view the world leans on the future as its true foundation.¹³ What gives consistency to the world—and happiness to the human heart—is the general thrust of all things toward what is yet to come. Were this forward momentum to slacken even momentarily, nature would be annihilated.¹⁴ A richly textured understanding of the world, therefore, will not only uncover the past but also imagine its future. But such a forward thrust requires that our consciousness adopt the posture of anticipation, hope, and openness to surprise. Science alone, with its flair for tracing the world's journey back into the remote past, is not equipped to deliver this kind of discernment. Christianity invites us to look at the world through the eyes of hope. "From first to last," Jürgen Moltmann says, "Christianity . . . is hope, forward looking and forward moving, and therefore also revolutionizing and transforming the present." Hope is the "medium of Christian faith as such, the key in which everything in it is set, the glow that suffuses everything here in the dawn of an expected new day."¹⁵

12. I am using this expression in order to capture the biblical sense that what is "really real" for a community of hope lies "up ahead" in a future that has yet to be actualized by the God who is coming. For similar, but not identical, views, see Moltmann, *Experiment Hope*, 48; Pannenberg, *Faith and Reality*, 58-59; Rahner, *Theological Investigations*, 6:59-68. It is especially Rahner's understanding of God as the "Absolute Future" that lies behind my understanding here.

13. Pierre Teilhard de Chardin, *Activation of Energy*, trans. René Hague (New York: Harcourt Brace Jovanovich, 1970), 239.

14. *Ibid.*

15. Moltmann, *Theology of Hope*, 16.

A NEW DAY FOR THE UNIVERSE

The new day that Christianity expects, however, is not exclusively one of personal, political, and social liberation. It is also a new day for the entire universe, the heavens and the earth, for what is visible and invisible. And it is just this *cosmic* expectation on the part of Christianity that I shall emphasize in these pages. For Christian theology, Moltmann continues, there is essentially “only one problem: the problem of the future.”¹⁶ But the future will comprise not only those episodes of the human story that are yet to unfold but also the ongoing story of a still unfinished universe. If we fail to keep our sights trained on the distant cosmic future, and instead focus myopically only on human destiny, we shall shrink even our human hopes to the point where they no longer energize our lives and works. Consequently, this book’s focus must be primarily on how the Christian hope for a new creation of the *cosmos* can frame the picture of the world that the natural sciences are now laying out before us.

Credo that profess to be based on the biblical experience claim in effect that *everything* can be made new. In the modern period, however, there has emerged—not for the first time in human history—a pessimistic picture of the universe that denies that any *real* renewal of its being is possible. What seems new to us, this belief system maintains, is in fact always old and unchanging. There is really nothing new under the sun. The truly lucid consciousness, Albert Camus writes, must therefore be cleansed of hope.¹⁷ Bertrand Russell echoes the sentiment: “Only on the firm foundation of unyielding despair can the soul’s habitation henceforth be safely built.”¹⁸ And the Nobel Prize-winning physicist Steven Weinberg declares that “it would be wonderful to find in the laws of nature a plan prepared by a concerned creator in which human beings played some special role. I find sadness in doubting that we will.”¹⁹

There can be no doubt that the birth of modern science, exciting as its discoveries have been, has simultaneously ushered in a fierce strain of pessimism about the future. Once again, this is partly because science looks essentially into the past, or into timeless laws of physics, for a “fundamental” under-

16. Ibid.

17. Albert Camus, *The Myth of Sisyphus, and Other Essays*, trans. Justin O’Brien (New York: Knopf, 1955).

18. Bertrand Russell, *Mysticism and Logic, and Other Essays* (1918; Garden City, N.Y.: Doubleday, 1957), 48.

19. Steven Weinberg, *Dreams of a Final Theory: The Scientist’s Search for the Ultimate Laws of Nature* (New York: Pantheon Books, 1993), 256.

standing of how things will eventually turn out. Explanation, as far as natural science is concerned, means tracing a line of causation back into a series of events that have already happened. If you want to understand how snow rabbits came to be white, for example, you have to imagine a process of natural selection whereby predators *in the past* devoured all the dark or spotted rabbits who could not camouflage themselves against the snowy backdrop of a northern climate. And if you want to understand the expansion rate of the universe you have to go back fourteen billion years to the Big Bang itself.

Habituated to science's method of looking back, modern intellectual life has adopted a picture of reality that stands in tension with Christian hope and its expectation of future transformation. The practice of looking into a past inertial chain of causes to acquire present understanding has swept over the whole world. It has found a comfortable home in academic thought, and from there it has oozed out into modern and postmodern culture. It has shaped dominant views of economics, politics, and personality. It continues to influence social thought and the practice of medicine. It has even infiltrated the world of religious reflection. But its primary place of residence is the impressive edifice of the natural sciences.

This scientific abode has not only functioned as a forum in which to celebrate great discoveries and intellectual achievements, but it has also served as a kind of customs house, where all who enter into the world of "true" knowledge must check much of their cognitional apparel at the door. In exchange for a ticket to see what science has uncovered, visitors must agree not to ask questions about the meaning or value of things. They must look at the objects on display through lenses that filter out any shade of inherent importance or purpose. Further, they must focus not so much on wholes, but instead on component parts, processes, and mechanisms that cause things to function in a specific way.

For much of the modern period the search for explanation in the domain of what is earlier-and-simpler has meant endorsing the point of view known as "scientific materialism."²⁰ Materialism is the belief that reality consists ultimately of mindless and lifeless bits of "matter." This belief still provides the backdrop of much research. Today many philosophers call it "physicalism" rather than materialism in order to signify their awareness that during the past century matter has increasingly shown itself to be much more subtle and slippery than we used to think. But physicalism no less than materialism takes the natural world, as made accessible to us by science, to be all there is. The

20. For a profound analysis and critique of scientific materialism, see Alfred North Whitehead, *Science and the Modern World* (New York: Free Press, 1925), 51-59.

most fundamentally explanatory science, therefore, is physics. According to materialist philosopher David Papineau,

physics, unlike the other special sciences, is complete, in the sense that all physical events are determined, or have their chances determined, by prior physical events according to physical laws. In other words, we never need to look beyond the realm of the physical in order to identify a set of antecedents which fixes the chances of subsequent physical occurrence. A purely physical specification, plus physical laws, will always suffice to tell us what is physically going to happen, insofar as that can be foretold at all.²¹

Materialism, or physicalism, implies a Godless world, whatever finer distinctions one might make. Here I wish only to indicate that in the intellectual world it is materialist belief, not science itself, that still constitutes the main challenge to religion and Christianity.

Any worldview that excludes the divine is also known more generally as “naturalism.”²² Naturalism is a broader notion than either materialism or physicalism, and it comes in many flavors. Its followers include not only the harder materialists and the softer physicalists but also those who are impressed by what seems to them to be the infinite resourcefulness and expansiveness of nature. Some naturalists are pantheists, others are “ecstatic naturalists,” and still others are materialists. Some think the universe is for us, others against us. But, at least as I shall be using the term, naturalism is best defined as “the belief that nature is all there is.”²³

Naturalism arose historically—and understandably—as a reaction to a one-sided, world-despising supernaturalism, the kind of religiosity that finds in the transient natural world little to inspire hope and so looks for salvation only up above, in another world apart from this one.²⁴ In its extreme forms, supernaturalism blunts the sense of a future *for* the world, persistently translating the invigorating sense of the “up ahead” into a stagnating “up above,” an interpretation that in turn leads at times to a religious hatred of nature. This perspective, it goes without saying, has little to do with the incarnational and eschatological perspective of biblical Christianity.

Naturalism is a powerful protest against extreme supernaturalism, and this protest comes in different forms. For example, there are both sunny and shady

21. David Papineau, *Philosophical Naturalism* (Cambridge, Mass.: Blackwell, 1993), 3.

22. Paul Tillich, *Systematic Theology*, 3 vols. (Chicago: University of Chicago Press, 1967), 2:5-10.

23. See Carl Sagan, *Cosmos* (New York: Ballantine Books, 1985), 1: “The universe is all that is, all there ever was and all there ever will be.” Also Charley Hardwick, *Events of Grace: Naturalism, Existentialism, and Theology* (Cambridge: Cambridge University Press, 1996).

24. Tillich, *Systematic Theology*, 2:5-10.

naturalists. Sunny naturalists insist that nature is enough to satisfy all our spiritual needs. To them there is no need for traditional kinds of worship since the universe itself is large enough to fulfill our hearts' deepest longings. To the sunny naturalist, Christianity is misguided in focusing on a God distinct from nature. According to this species of naturalism the idea of God is not only scientifically unnecessary but also religiously and morally superfluous. Nature is enough. Shady naturalists, on the other hand, claim that since nature is the source of suffering and death, and not just of life and beauty, it would be silly to make any religious covenant with it. Shady naturalists are sad that the world seems so Godless. It would be comforting, they admit, to know that a beneficent providence governs the world, but scientific honesty requires that we now abandon such naïve trust. The world is headed toward final oblivion, so the best we can do is acquire a sense of honor for not having denied the fact of nature's tragic destiny.²⁵

As far as the present study is concerned, I shall use the term "naturalism" to designate the broadly shared conviction, whether sunny or shady, that nature, as made available to ordinary experience and scientific discovery, is literally "all there is." And when I use the term "religion" I am referring henceforth to the belief that nature is *not* all there is. Christianity is a religion in this sense, but it is also one whose core teachings emphasize the goodness, and what I shall call the *promise*, of nature. In spite of the well-known historical difficulties associated with Galileo and Darwin, Christianity has no quarrel with science, as Pope John Paul II has recently emphasized.²⁶ But Christianity is inalterably opposed to naturalism. This book will take the position that it is not science but a kind of materialist naturalism often mistaken for science that stands in conflict with the beliefs of Christianity and other faiths. When Christian faith comes face to face with science itself, it finds a friend with whom it can converse, whatever blunders and misunderstanding there may have been in the past. With naturalism, however, there can be no fruitful coalition.²⁷

Science, as Alfred North Whitehead acknowledged in the early twentieth century, has often metamorphosed into the defense of materialist naturalism,

25. Weinberg, *Dreams of a Final Theory*, 255, 260.

26. Pope John Paul II, "Address to the Pontifical Academy of Sciences," November 10, 1979; *Origins*, *CNS Documentary Service* 9, 24 (November 29, 1979), 391; also Cardinal Poupard, "Galileo: Report on Papal Commission Findings," *Origins* 22, 22 (November 12, 1992), 375; Pope John Paul II, "Letter to the Reverend George V. Coyne, S.J., Director of the Vatican Observatory," in *Origins* 18, 23 (November 17, 1988), 377.

27. This is not to say that Christians cannot form fruitful alliances with *naturalists* as distinct from naturalism. Indeed, on many ethical issues, such as the ecological predicament, cooperation is both warm and fertile.

much to its own detriment.²⁸ In doing so it has implicitly abandoned the idea that anything in the universe can be truly new. It is this dogma, not science itself, that stands in opposition to the essential biblical belief in God. In a materialist venue every scientific finding is just one more monotonous unearthing of what we already knew about the inner essence of things. Life, for example, is really “just chemistry.” Mind is nothing more than matter parading itself under peculiar organic conditions. And the world deep down is really nothing more than a set of timeless physical routines *masquerading* as matter, life, mind, and spirit.²⁹

Christianity, on the other hand, believes in an eternal freshness of being. Its God is one “who makes all things new” (Rev 23:5). Its expectation is that a new world is already being created. So Christian faith, though not irreconcilable with science, *is* irreconcilable with the modern materialist naturalism which logically rules out any such novelty. The really important disagreement, therefore, lies between naturalist physicalism, on the one hand, and a belief that the world can be made new, on the other.

SCIENCE, FREEDOM, AND THE FUTURE

Science is not the same thing as scientism, the belief that science alone can provide in principle an adequate understanding of everything. And, as I have already tried to make clear, science differs from scientific naturalism, the belief that nature is all there is. In fact, science from now on can become even more insightful if it casts off the antiquated materialist naturalism that holds it back from open-ended inquiry into the new. If it were to abandon the narrowly physicalist framework that has been its home for over three centuries, scientific exploration could be made compatible with a worldview that allows the world to manifest itself as truly unprecedented. In doing so it would also ensure that scientific inquiry will always have a future. This book, therefore, will attempt to express what some of the main discoveries of science can mean if we interpret them in the light of Christian expectation. It will be a *theology of nature* rather than a natural theology. Natural theology tries to show what nature, as scientifically known, can tell us about the existence of God. As I see it, however, a Christian theology of nature tries to express what the natural world means when we take it to be grounded in the reality of the God who in Christ and through the Spirit makes all things new.

28. Whitehead, *Science and the Modern World*, 51-59.

29. P. W. Atkins, *The 2nd Law: Energy, Chaos, and Form* (New York: Scientific American Books, 1994), esp. 200.

Christian faith, as it comes into encounter with science, need not present itself as terribly complicated. It is both simple and profound, but it does not have to appear convoluted. Even the doctrine of the Trinity does not have to be made needlessly arcane, although it will always remain mysterious. As a start we may express the substance of Christian faith in only three propositions. First, Christians believe in the reality of a transcendent mystery, the origin, ground, and destiny of the universe. We name this great mystery God. In Christian thought the all-encompassing origin, ground, and destiny of the universe is called the “Father,” whom Jesus addressed intimately as *Abba*. Along with the faith of Israel, Christians understand this God as one who makes and keeps promises, breathes existence into all things, opens up the future, and makes all things new, even to the point of defeating death. As we shall see, science may seem at first to make the reality of a promising God questionable, but a Christian understanding of God provides human minds, including those of scientists, with limitless breathing room. God is the ground of freedom by virtue of being the world’s future.

Second, Christianity instructs us that we should not think about God without first thinking about the man Jesus of Nazareth, the one who is called the Christ, the Messiah, the promised one who has become the foundation of all hope. The picture of Jesus given in the Christian tradition is that of a compassionately healing personality who, as the Son of God, was crucified but rose from the dead. Jesus is the very incarnation of God—the eternal divine Logos, the Word of God made flesh. As the risen Lord, the Son of God continues even now to open up the entirety of creation to a new future. Only in the context of a cosmic future centered on the risen Christ can we hope to enjoy the fullness of redemption and freedom.

Third, Christianity is about the work of the Spirit. According to St. John, early Christian writings, and the Nicene Creed, we understand the Spirit as the Giver of Life. The work of the Spirit is that of actualizing *emergence* in nature, of liberating life and consciousness from deterministic physical routine, and of sparking the urge toward freedom in human persons. The life of Jesus is one of being moved, even driven, by the Spirit of life and freedom. “It is for freedom,” St. Paul says, “that Christ has set us free. Stand firm, then, and do not let yourselves be burdened again by a yoke of slavery” (Gal 5:1).

Each generation of Christians has to understand afresh what these words of St. Paul signify. Today we need to discern what they might mean in terms of scientific pictures of the world. The faith of Christians is a call to the fullness of freedom in the Spirit. But what could freedom possibly mean in an age of science? Science, after all, suggests that we are products of deterministic causal processes and hence that we are not really free after all. We are part of the physical universe where every event is the effect of invariant physical

causes arising from the causal past. If we are part of law-bound nature, how could there be any room even for free choice, let alone for the exalted kind of liberty St. Paul is talking about?

This is one of many puzzles that science sets before theology today. In previous ages religions and philosophies often assumed that humans are not really a part of nature, so it was simpler then to think of ourselves as free. We were souls only temporarily encumbered by bodies. Today such a belief is incredible. Science has shown that we are completely continuous with natural processes even though our existence simultaneously extends toward what is not-yet. The physical universe gave birth to humanity no less than to other forms of life very gradually over the course of an immense amount of time. We are just as natural as bacteria, trees, and rodents. How then can we plausibly claim to be free without denying that we are also natural?

We need to face such questions squarely today. When I say “we” I mean not only Christians but other religious traditions as well. In this book I shall speak from a Christian perspective while simultaneously keeping in mind the implications of science for other traditions as well. I shall argue, in a manner that applies also to the wider story of religion on earth, that Christian theology must keep growing in the presence of scientific challenges, but without surrendering its hope for new creation. Today theology must become more attuned to biological evolution and the expanding universe, realities that for many sincere seekers have surpassed in magnitude and explanatory power our traditional ideas about God. A theology of nature, therefore, must show how theological reflection can provide a wide and generous ambience for the work of science. Christianity, of course, cannot introduce any new scientific information. It cannot determine whether this or that scientific idea is true or false. But a Christian theological setting can liberate science from belief systems—such as scientific naturalism—that make the world too small for both theology and open-minded scientific inquiry itself.³⁰

THE PROMISE OF NATURE

In Christ the ultimate mystery that encompasses all created being is revealed as self-giving love and saving future. What then should we expect the universe to look like in light of the divine humility and promise that enfold it? My pro-

30. John Paul II, “Letter to the Reverend George V. Coyne, S.J., Director of the Vatican Observatory,” *Origins* 18, 23 (November 17, 1988), 378: “Science can purify religion from error and superstition; religion can purify science from idolatry and false absolutes. Each can draw the other into a wider world, a world in which both can flourish.”

positional is that a faith shaped by a Christian sense of God's self-limiting love, a love that lays open the future to new creation, should already have prepared our minds and hearts for the kind of universe that science is now spreading out in front of us.

Science has demonstrated over the past century and a half that the universe is a still-unfolding process and that it is unfathomably vaster and older than we had ever imagined before. The cosmos came into being long before the arrival of human history, Israel, and the church. Apparently God's creative vision for the world extends far beyond terrestrial precincts and ecclesiastical preoccupations. Nevertheless, a Christian theology of nature emanates from and tries to remain faithful to the teachings of the community of hope known as the church. Inspired by the "cloud of witnesses" (Heb 12:1) that has kept hope alive since Abraham, it wagers that the promissory perspective of biblical faith that enlivens people of faith is applicable also to cosmic reality in all of its enormous breadth and depth. "Thou hast made thy promise wide as the heavens," the psalmist exclaims (Ps 138:2, *New English Bible*). So, at least from the perspective of biblical faith, all those billions of years that preceded the emergence of Israel and Christianity were already seeded with promise.

With the eyes of hope one may still apprehend a vein of promise in this ambiguous cosmos. Genuine hope does not lead to escapist illusions but instead opens a space in which the scientific mind can breathe more freely than in the stagnant atmosphere of modern materialism. Hope will allow us to see that the world given to us by contemporary science has always possessed an *anticipatory* character. It has always been open to future surprise, though naturalistic pessimism has failed to notice. From the beginning the universe has extended itself toward the actualizing of new and unprecedented possibilities. It is still doing so, especially through one of its most recent evolutionary inventions, human consciousness. Through our own forays of hope, the universe now continues to seek out its future, a future whose ultimate depth we may call God.

After the phenomenon of mind had burst onto the terrestrial scene, the world's emergent straining toward the future took the form of religious aspiration everywhere. In the West it broke through in the hope we associate with Abraham, the prophets, and Jesus. Science itself, because of its orientation toward earlier and simpler lines of causation, knows nothing of any promise in nature, nor should we expect it to. Nevertheless, even though science cannot accurately predict the actual shape of the real novelty that will emerge in the future, this is no reason to assume that future cosmic happenings will somehow contradict the laws of physics, chemistry, and biology. The predictable habits of nature will go on functioning as before, but they will be taken up into an indefinite array of novel configurations.

THE MEANING OF MIRACLES

It is in terms of this promissory understanding of nature, it seems to me, that theology can speak most appropriately about miracles. Often the biggest obstacle to a scientifically educated person's acceptance of Christian faith is that it speaks of signs and wonders that seem to violate the inviolable laws of nature on which science depends for its own credibility. Later on we shall note, for example, that Albert Einstein rejected all forms of biblical theism because its devotees believe in a personal, responsive God who is said to be able to answer prayers and work miracles. To Einstein the existence of a supernatural agent who can intervene in the law-bound world and suspend its predictable operations is incompatible with science. Science has to assume, he insisted, that nature admits of no exceptions whatsoever. After all, what would be the point of scientists' articulating the unchanging laws of physics if nature could take off in unpredictable directions any time it—or God—was so inclined?

Theologians, I am convinced, must be sensitive to the fact that for scientifically educated people belief in miracles is a great obstacle to faith. We must be honest enough to ask whether Christian instruction, by insisting on a simplistic and literalist understanding of miracles, has tossed a false stumbling block onto the path of many who in other respects may be deeply attracted to Christianity. The same concern applies also to the matter of how to interpret the resurrection of Jesus from the dead. By giving people the impression that the resurrection and miracle stories are literally "violations" of nature,³¹ have we perhaps distracted ourselves from their real meaning and at the same time made them appear unnecessary impediments to genuine faith?

In pulling together a response to these questions, an appropriate starting point might be to understand the resurrection of Jesus, and by analogy his own life and works of power (sometimes called miracles), as violations not of nature or science but of any worldview that makes deadness the most fundamental and "normal" state of being. As I shall argue later and at more length, the modern world has harbored, along with many other strains of thought, an "ontology of death." Both theologian Paul Tillich and philosopher Hans Jonas apply this formidable designation to the modern naturalistic assumption that everything alive came from, is explainable by, and is destined to return to, a state of absolute lifelessness.³² It is not just the death of Jesus or of the total-

31. E.g., Norman L. Geisler, *Miracles and Modern Thought* (Grand Rapids: Zondervan, 1982), 12.

32. Hans Jonas, *The Phenomenon of Life* (New York: Harper & Row, 1966), 9; Tillich, *Systematic Theology*, 3:19.

ity of humans that the resurrection overturns. It also opposes any understanding of the universe that gives explanatory finality to what is dead. Epistemologically speaking, therefore, our minds need to be transposed into an anticipatory key in order to become attuned to the implications of Jesus' resurrection as well as the meaning of miracle stories in the Bible.

An ontology of death maintains that the most probable, natural, and intelligible state of being is death, not life. A resurrection faith contradicts such a sense of reality, aware that the chronological priority of lifeless matter in nature's history, or its extensiveness in space, is not the same as being ontologically foundational. Moreover, resisting the grounding assumptions of materialism does not entail opposition to science. Christian faith contradicts any worldview that forbids the breaking in of a *novum ultimum* ("what is ultimately new"), but this does not carry with it the implication that it opposes science. Whatever more specific interpretation we might give the New Testament accounts of Jesus' deeds and his being raised from the dead, we miss their point if we fail to realize that they are thoroughly eschatological. It is the breaking in of a radically new future in the person of Jesus that the New Testament authors are trying to communicate in their accounts of Jesus' life, words, works of power (*dynamis* in Greek), and resurrection from the dead. But this breaking in of the future does not mean the breaking down of nature, so science as such is not disturbed.

In order to hear properly the evangelists' or St. Paul's witness to the risen Lord, perhaps we need to have our thoughts and sensibilities transformed from the bottom up by the Bible's anticipatory worldview. However, it is just this worldview, a metaphysics of the future, that is the true stumbling block to Christian faith in an age of science. Requiring scientists to accept the resurrection simply as a past event that violated nature and the laws of science only raises a needless barrier to embracing a life of Christian hope. It is both unnecessary and misleading to make scientifically educated people swallow the idea that the redemptive acts of God are fundamentally an interruption of the continuum of cause and effect in nature, or to ask them to believe that God has to suspend the laws of physics in order to answer our prayers.

However, by removing these obstacles, a theology of nature will not make Christianity easier to accept. It will require a larger leap than ever, but at least it is a leap that will not require the repudiation of the well-established results of empirical science. Something drastic, world-shaking, and soul-shattering will be required by embracing a resurrection faith, but intellectual integrity will not have to be compromised. After encountering the *real* challenge of Christianity it may even seem easier and more tempting, though certainly not as adventurous and exciting, to revert to the notion of miracles and resurrection as though they were simply God's way of showing that the laws of nature

can be broken. Christianity demands something much more consequential than such credulity. It demands the transformation of our whole understanding of the universe if we are to arrive at an appropriate understanding of God, nature, and ourselves. This transformation can occur, I believe, without our having to reject or edit anything we have learned from science. It is not science that is at stake in this process of conversion. What is at issue is the firmly entrenched ontology of death that underlies the naturalistic worldview. What will be threatened is the common assumption that we can find in the state of lifelessness and mindlessness a fundamental understanding of nature.

In brief, Christianity's real invitation is to let ourselves be grasped and shaken by the power of the future that is now and always dawning. The challenge to accept the news of Jesus' resurrection and his works of wonder is of a piece with the summons to believe that the entire universe is undergoing creative transformation. The truly important challenge of faith is to resist the always strong, but simplistic and enervating, inclination to view the world as resting on the dead physical past, and to learn instead to realize, as Teilhard has put it, that the world rests on the future as its sole foundation. The real challenge of Christian faith in an age of science is to realize the ontological primacy of life over the deadness that materialists take to be the normal, natural, and most intelligible state of being. I shall develop these reflections further in chapters 8 and 9.

SUGGESTIONS FOR FURTHER READING AND STUDY

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