

GOD IN RELATION TO NATURE

Can science's account of the regularity of nature be reconciled with Christianity's talk of the God who acts in history?

About the Author:

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Whatever it may mean to say that God is personal, such language must surely imply that God is active, doing particular things on particular occasions and not just functioning as an unchanging effect like the law of gravity. In recent years, the intellectual conversation between science and theology has moved on from natural theology's appeal to God as the ground of order and fruitfulness, to a more central theistic concern with the God of providence. On the one hand, we have science's account of the regularity of the processes of nature. On the other hand, we have Christian theology's claim to speak of the God who acts in history. Can the two be reconciled with each other? Achieving this end may require some flexibility from both science and theology in their assessments of the understandings that they bring to the dialogue.

The philosopher of history and historian of ideas, R.G. Collingwood, in his posthumously published book, *The Idea of Nature*,¹ proposed the thesis that there have been three eras in reflective thinking about the nature of the world, corresponding respectively to: (i) the ancient Greeks and their medieval intellectual successors; (ii) the Renaissance period and the birth of modern science; (iii) the modern period of the last two hundred years. In the first era, nature was thought of on the model of an organism. Greek natural science, Collingwood tells us, "was based on the principle that the world of nature is saturated or permeated by mind".² Its ceaseless motion arises from its being alive. In the second era, nature was thought of on the model of a machine. The physical world was considered to be clockwork so that, in the thought of Descartes, even animals were treated as being merely intricate robots. The only exceptions to this rule were the intentional acts willed by human minds or by disembodied spirits. Notoriously, Cartesian metaphysics proved impotent to integrate, in a satisfactory manner, mental acts with the motion of extended matter. Collingwood believed that what distinguished the modern era from its two predecessors was the recognition of the role of history. Thus unfolding process, particularly evolutionary process, is the fundamental model in its thinking about nature.

Such tidy schemes can only be produced by a somewhat coarse-grained account that does not worry over much about contrary details. More refined analysis will reveal the ebb and flow of currents and counter-currents of opinion.³ Nevertheless, Collingwood's broad-brush classification provides a useful framework for metaphysical thinking. Nature may be considered either as being in some sense alive, or as being mechanical, or as an unfolding process bringing emergent novelty into being.

Just as physics does not determine metaphysics though it certainly constrains it, so metaphysics in its turn does not determine theology though it certainly constrains the kind of theological thinking that will seem congenial and convincing. Each of Collingwood's three options has associated with it a particular way of conceiving of God and of God's relationship to nature.

THE ORGANIC MODEL

If the world were an organism, then it would be natural to think of God in terms of the World Soul. Divine action with respect to the universe might then be expected to be analogous to our human action within our bodies. There are a few contemporary theologians, such as Grace Jantzen,⁴ who explicitly defend the idea of divine embodiment in the world. In addition, the idea of nature as an organism is a commonplace of much New Age thinking, usually expressed in the parochial terms of terrestrial Gaia rather than a truly cosmic Ouranos.

Scientifically, such ideas founder on the fact that, however integrated Earth's ecosystem may or may not prove to be, the universe itself is too disseminated an entity to be described convincingly in organic terms. It does not possess anything like the degree of inter-relationship that characterises the parts of an organism.

Metaphysically, such ideas founder on the fact that, if they are not to amount to a simple pantheistic equation of nature and God, their implementation requires reliance on the dubious dualistic notion of a distinct separation between the soul (mirroring God) and the body (mirroring the universe).

Theologically, such ideas founder on the fact that they bind God too closely to creation, making divine existence coextensive with that of the universe, so that it is presumably finite in the past (beginning with the big bang) and, perhaps, finite in the future also (ending with the big crunch). God would then die with the death of the cosmos. So total a degree of divine immanence is theologically unacceptable, for it would imply that God is in thrall to the history of the universe.

The concept could, however, be modified in a number of ways. Panentheism retains the ghost of divine embodiment in its belief that "the Being of God includes and penetrates the whole universe, so that every part of it exists in Him but (as against pantheism) that His Being is more than, and is not exhausted by, the universe".⁵ Arthur Peacocke denies that this implies that the world is in some sense a part of God,⁶ but doubts must linger about whether this particular way of seeking to maintain a balance between divine transcendence and divine immanence can succeed in the delicate feat of avoiding such a conclusion. Certainly the doyen of panentheists, Charles Hartshorne, said that God "is both the system [the universe] and something independent of it".⁷

The highly speculative and uncertain ideas of quantum cosmology⁸ could provide a way of rescuing such a God from sharing the fate of our observable universe. According to some theories, this world is just one among infinitely many that bubble up out of a universal and truly active medium, the vacuum state of quantum gravity. Each individual world rises and falls, but the process itself continues ceaselessly "for ever". If there is room for a God in such speculations, it might seem to lie in a pantheistic identification of the divine with the quantum vacuum itself, an idea of extreme theological etiolation.

THE CELESTIAL MACHINE

If the world were a mechanism, then it would be natural to think of God as the Celestial Engineer. Divine action would be limited to the initial construction, and the subsequent maintenance in existence, of the cosmic machine. Perhaps there might also be a need for occasional interventions to correct faulty workings, were they to occur. This is the kind of view that Isaac Newton seems to have held, at least about the non-human universe, believing that tendencies to instabilities in the solar system would require divine attention every fifty thousand years or so if the system's integrity were to be maintained. Newton was deeply impressed by the beautiful and orderly construction of the

celestial machine, claiming that this demonstrated that there must be divine Intelligence behind its contrivance.

However, such an interpretation proved not to provide lasting intellectual satisfaction. Leibniz was quick to point out that a machine that required periodic attention to keep it going fell short of the perfection to be expected of divine handiwork. Worse still, once God had been reduced to being just a clockmaker, the apparent self-sufficiency of the machine threatened to make otiose even that deistic role. This was to lead later in the eighteenth century to the atheistic proclamation of the properties of matter as being the sole and sufficient ground of explanation. In many minds, God seemed to have been made redundant.

Scientifically, such ideas founder on the twentieth-century discoveries of quantum theory and chaos theory. The widespread intrinsic unpredictabilities that these theories entail show that the physical world is not simply mechanical, in the sense of being predictable and controllable, but it is something subtler, and perhaps suppler, than that.

Metaphysically, such ideas founder on their inability, in any convincing way, to accommodate mental activity within their account of reality. We should not so readily abandon the attempt to take seriously that realm of experience which, in actual fact, is the ground of all our perception and knowledge.

Theologically, such ideas founder, not only because the God of deism is inadequate to account for the Christian intuitions of prayer and providence, but also because that God has so little to do that, for many, a thorough-going atheism eventually appears to be a more economical proposition. At best, the question of divine existence is left open, its answer laden with so little consequence that it becomes almost a matter of indifference what that answer might prove to be.

The Evolutionary Model and Divine Kenosis

If the world is an evolving process still in via, then God may be expected to be in interactive relationship with its unfolding history. There is no need, however, for the Creator to be a Cosmic Tyrant, in total control of all that is happening. Indeed, the play of creation, as we perceive it, has more the appearance of an improvisation than the performance of a predetermined script.

One of the immediate Christian responses to the publication in 1859 of Charles Darwin's *Origin of Species* was Charles Kingsley's recognition that the Creator was no longer to be thought of as the originator of a ready-made world but as the giver of a creation "allowed to make itself". In twentieth-century theology, this idea has been developed to the point of acknowledging that there is a divine kenosis involved in the act of creation. The Creator self-limits divine power in allowing the created-other to be truly itself, in its God-given freedom of being. Such a degree of setting aside of total divine control is perceived to be fitting for the God whose character is love and whose nature would be incompatible with the exercise of a cosmic tyranny.

A kenotic account of creation is of great significance in theodicy's attempt to wrestle with the perplexities posed by the evil and suffering so clearly and painfully present in the world. If it is the case that not every event is brought about by a direct exercise of divine power, then not everything that happens can be expected to accord with God's benevolent will. Just as the human exercise of free will can lead either to the deeds of a Mother Theresa or to the acts of a Stalin, so nature allowed to make itself will be a world in which death is the necessary cost of new life. The possibility of genetic mutations producing new species cannot be divorced from the possibility of genetic mutations producing malignancy, and rain for crops and destructive storm winds will both be part of the way the weather turns out to be. Among theologians who have particularly developed this

theme has been Jürgen Moltmann⁹ (employing the kabbalistic notion of zimsum, a divine ontological making-room for the existence of another) and W. H. Vanstone¹⁰ (based on a meditative consideration of the necessary precariousness involved in any loving act of creativity and on a recognition of the value conferred by such an act).

Scientifically, such ideas draw support from two kinds of discovery that have been made in the last two centuries. The first set relates to an increasing acknowledgment of the role of historical process in the formation of the physical world as we observe it today: successively the discovery, in the late eighteenth and early nineteenth centuries, of the geological history of the Earth; the recognition, in the later nineteenth century, of the evolving biological history of life on Earth; the discovery, somewhat reluctantly arrived at in the early twentieth century, that the universe itself has had a history, stemming from the big bang.

Quantum Theory and Chaos Theory

The second set is the discovery of intrinsic unpredictabilities, of the kind already referred to, in the behaviour of both quantum mechanical and classical physical systems. If these phenomena are to be understood as signs of the openness of the future to the emergence of true novelty, then their unpredictabilities will have to be interpreted, not just as epistemological defects, limiting our ability to know in detail what is going to happen, but as ontological opportunities, permitting the operation of additional causal principles, over and above the energetic transactions that physics describes.

In the case of quantum theory, such a strategy has been almost universally adopted, so that Heisenberg's uncertainty principle has become, in the minds of most physicists, a principle of indeterminacy. The additional causal principle held to be operating in this case is then usually considered to be pure randomness, so that the outcomes of indeterminate quantum measurements are said to occur simply "by chance".

In the case of chaos theory, this ontological option has been far less popular, though it has been defended by some people, including the present writer.¹¹ What the corresponding additional causal principles might be will be discussed shortly. The philosophical case for treating quantum theory and chaos theory similarly in this respect, derives from the fact that what would then be involved for either theory would be an alignment of epistemology (knowledge of future behaviour limited by intrinsic unpredictability) and ontology (the claim of a corresponding causal openness) as closely as possible with each other.

This strategy would accord well with the realist stance adopted, consciously or unconsciously, by scientists in relation to the significance of their work. Almost all of them believe that the knowledge that they acquire as the result of so much trouble in the course of their researches, is a reliable guide to what the physical world is actually like. Contrary to Kant, they do not divorce phenomena (known appearance) from noumena (the real nature of things). Unless one were learning, by means of science's intricate and artificially contrived experimental procedures, what the world is really like, the whole enterprise would not seem worth the time, talent and treasure spent upon it. A critical realist interpretation of this kind is not logically necessary, either for quantum theory or for chaos theory, but it is needed to sustain the scientific endeavour and, I would claim, to explain its success.¹²

Metaphysically, such ideas draw their support from the consideration that an extension of causal principles beyond the energetic exchanges described by a reductionist physics, might offer the glimmer of the possibility of accommodating, within this enhanced understanding, a genuinely instrumental role for mind, active in the execution of human intentions. Whether this hope has any grounds, we shall have to look at in due course.

Theologically, such ideas draw support from the related consideration that a physical world found to be sufficiently supple in its process to accommodate human agency, might also be expected to display an analogous ability to be open to divine providential action. While the possibility of this prospect has certain obvious attractions for the theologian, it also represents embarking on a line of argument that runs counter to much traditional theological thinking. Its frank appeal to an analogy between human and divine agency might seem to lead to the danger of assimilating the Creator to creatures, an elision that the Judaeo-Christian-Islamic tradition has always strenuously resisted. God must remain God, in all the uniqueness and ineffability of deity.

A further danger might be feared to lie in the appeal being made to twentieth-century science. Dean Inge warned us that he who marries the spirit of the age will soon find himself a widower. The history of science is full of revisions—of revolutions, even, if we were to credit the account of Thomas Kuhn.¹³ In any case, are we to suppose that, before the discoveries of quantum theory and chaos theory, an honest theologian was impotent to talk convincingly of God's action in the world? That is certainly not how the record of theological tradition actually reads. Many of its most influential figures used an altogether different metaphysical strategy for their discussion of providence.

Classical theology from Augustine onwards, and most powerfully expressed in the writings of Aquinas, sought to preserve the uniqueness of divine action by speaking of God's primary causality, exercised in and under the manifold secondary causalities of creatures. No explanation was given of how this happens; it was simply said to be the case. Any attempt to exhibit the "causal joint" by which the double agency of divine and creaturely causalities related to each other was held to be impossible, or even impious.

Three assertions were important consequences of this point of view. The first was that the ineffability of the mode of action of this primary causality had the effect of totally repudiating any possibility of an analogy between human and divine agencies. A second assertion was that God is fully party to every event, not simply by allowing it to happen by divine permission as the creation is held in being, but in bringing it about through the exercise of divine will. Nothing is outside direct divine control, an assertion that poses obvious problems for theodicy, which can only match the veiled and mysterious character of primary causality with the veiled and mysterious claim that in the end all will be found to have been for the best. *O felix culpa!* is to be written over all of human, terrestrial and cosmic history.

The third assertion was that primary causality is so divorced in character from secondary causality that it may be held to be active whatever form the latter is believed by science to take. Theology is made invulnerable to whatever may currently be claimed about the process of the physical world. It seems that this feature has had a particular attraction for twentieth-century defenders of primary causality, such as Austin Farrer.¹⁴ However, some of us feel that the deep obscurity involved in the idea of a double agency, operating simultaneously through both primary causality and secondary causalities, carries with it the danger that the discussion might turn out to be no more than double talk.

What, for its partisans, is the strength of the idea of primary and secondary causality is, for its critics, its greatest weakness. The strategy represents an extreme case of a "two-languages" approach to understanding how theology and science relate to each other. Their discussions are treated as independent, so that they talk past each other at different levels of discourse. The two disciplines might then be considered as presenting two different paradigms or involving participation in two different language games.

THE UNITY OF KNOWLEDGE AND TRUTH

This point of view is rightly and emphatically rejected by many who work at the interface between science and theology, and particularly by such scientist-theologians as Barbour, Peacocke and myself.¹⁵ In its place, we wish to assert that the unity of knowledge and truth is ultimately guaranteed by the oneness of the Creator. It means that there is active intercourse across the boundary between the two disciplines, of a kind variously characterised as aiming at consonance, dialogue, integration, or assimilation. In our view, creation is not so distanced from its Creator that the character of its history and process affords no clue to the nature of God's interaction with it.

Those who adopt this latter stance then have to explain how they are to understand and cope with the changes that occur in scientific understanding and how these might relate to theology. Broadly speaking, the answer will be the same, both within science and beyond it. The clue lies in the recognition both of the limited and provisional character of current knowledge and also of the persistence of some well-tested forms of insight beyond the era of their discovery.

Contemporary science is always incomplete but it is also the platform from which the continuing search for a fuller and more secure understanding can be launched. At any given time, current science will include some elements that will prove long-lasting and some that will prove to be in need of correction. There will also be some phenomena that are known to occur but whose nature is still beyond the reach of current theory. In other words, science is both precarious and successful, requiring a humble assessment of its achievements but yielding lasting insights and rewarding boldness in their further exploitation and extension.

Galileo provides us with an example of what I mean. He began to develop a recognisably modern and successful concept of inertia in order to explain how the Earth could be rotating on its axis and encircling the Sun, without our being aware of this in terms of obvious terrestrial phenomena (such as would have been the case if we had been left behind!). This was an immensely important insight of lasting validity. At the same time, he believed that these ideas could also be used to explain the action of the tides. He repudiated Kepler's suggestion that the Moon might play an important role in this phenomenon. In this respect, Galileo was mistaken, as soon became apparent. Neither he nor Kepler could make quantitative progress in understanding the details of tidal behaviour. That required Newton's great discovery of the existence of universal gravity and the precise form that it took. Yet Newton, as he said, "stood on the shoulders of giants" and his theory of motion built on the insights of Galileo. This story of partial and provisional success leading on to further advance, is characteristic of the way that science progresses, bit by bit. Some of its ideas will prove transient but some of them will prove enduring.

Many phenomena have become known to science well before a theoretical framework was in place for understanding them. At the end of the nineteenth century, physicists could not reconcile the temperature of the Earth, or the continued shining of the Sun, with the long periods of time over which the evolutionary biologists asserted that these phenomena must have been sustained. Radioactivity (which generates heat within the Earth) and nuclear reactions (which fuel the Sun) were then unknown and unsuspected. Lord Kelvin was rash enough to claim that the physicists' inability to comprehend these long-lasting phenomena must mean that the biologists were mistaken. The error, however, was Kelvin's and it derived from his overconfidence about the completeness of nineteenth century physics. Later, many properties of matter and of radiation became known which remained unintelligible until the discovery of quantum theory shed light on the processes that lay behind them.

Almost all scientists believe the progress of science is a convergence onto an increasingly verisimilitudinous understanding of the nature of the physical world. We are its map-makers, never able to give a totally comprehensive account—sometimes, as the scale changes, having radically to revise our views (that patch of apparent Newtonian terra firma turns out to be a quantum swamp), yet improving overall accuracy with each major discovery. Progress is not made either by denying the existence of phenomena that we currently cannot understand or by exaggerating (as the elderly Kelvin did) the scope of what we have currently achieved. Persistence and openness in investigation, and a degree of realistically humble assessment of present attainment, are indispensable virtues in the pursuit of science.

This edifying conclusion is of wider application than just within science alone. It certainly bears extension to theology and to the interaction between theology and science. If we do not display a certain degree of intellectual daring, no progress will be made. If we do not display a certain degree of intellectual humility, misleading and untenable claims will be made. If we are not content to live with the acknowledgement that there are phenomena that are beyond our contemporary powers of explanation, we shall have a truncated and inadequate grasp of reality.

QUESTIONS OF AGENCY, HUMAN AND DIVINE

Human agency, and divine providential agency, both clearly fall into the category of experience that is presently beyond our capacity for full understanding. As persons, we should not deny our basic experience of free choice and consequent moral responsibility. Nor should we deny our experiences of prayer and intimations of providence. As Christians, we should hold fast to our intuition, and the testimony of our tradition, that God acts in the world. As rational thinkers convinced of the unity of knowledge, we should not forgo the attempt, however modest and tentative it must necessarily be, to see whether a metaphysical conjecture, based on an ontological interpretation of the intrinsic unpredictabilities of physical process, might not afford us some insight into questions of agency. That is the task to which we must now return.

One of the first attempts of this kind was made by William Pollard,¹⁶ who looked to the uncertainties of quantum events to provide some room for providential manoeuvre. The idea has recently been revived by a number of writers,¹⁷ but this approach encounters some difficulties. One is that quantum events take place in the atomic realm of the very small and the resulting uncertainties tend to cancel each other out when a very large number of such events are combined to describe the behaviour of a lump of matter of a size sufficient to be relevant to what is happening on a humanly perceptible and significant scale. Another problem is that quantum uncertainties only relate to those particular kinds of events that we call measurements. By its nature, measurement only occurs from time to time, so that agency exercised in this way would have a curiously sporadic character.

Finally, we may observe that if microscopic quantum events are to have macroscopic consequences, this can only be through an enhancement of their effect due to their being part of a much larger system which is extremely sensitive to the fine details of its circumstance. Chaotic systems have this character (though it is necessary to add that currently there is a degree of perplexity about how to think correctly about the relationship of microscopic quantum systems and macroscopic chaotic systems to each other). For these reasons, the primary focus of our discussion will be on the possibilities offered directly by chaotic unpredictabilities.

We have seen that if these unpredictabilities are to be given an ontological interpretation, this will imply that additional causal principles must be at work bringing about the future, over and above the effect of the energetic exchanges between constituents which conventional physics describes.

While there is currently no fully articulated theory of these extra causal principles, their general character is fairly clear.

THE SIGNIFICANCE OF PATTERN AND CONTEXT

Study of complex systems has served to emphasise that our description of physical process must have a dual character, involving not only energy but also what one might call "pattern". The future behaviour of a chaotic system is not totally haphazard. It displays a kind of orderly disorder. What will happen is confined within a large but restricted range of possibilities that technically is called a "strange attractor". This consists of a portfolio of possible future patterns of motion, all of the same energy but differing in the details of the way in which they unfold. There are a number of executive toys consisting of jointed rods and weights which, when released from apparently the same configuration, nevertheless exhibit a bewildering and unpredictable variety of subsequent motions. Playing with one of these toys is just an exploration of its strange attractor. The openness that a chaotic system can be interpreted as possessing corresponds to the multiplicity of possibilities contained within this strange attractor, and any one of the motions that is actually executed can be understood as corresponding to an input of information specifying its detailed structure ("this way, then that way, etc").

The corresponding new causal principles can, therefore, be anticipated to complement energetic causality with a pattern-forming informational causality. This conjecture is reinforced by considering other recent discoveries. Dissipative systems, maintained far from thermodynamic equilibrium by the input of energy from their environment, can manifest the spontaneous generation of an astonishing degree of orderly pattern. For example, in a certain type of convective fluid motion between two heated plates, the movement is confined within a regular series of hexagonal convection columns, an effect involving the correlated motion of trillions of molecules. Complex systems manifest surprising powers of self-organisation. For example, networks of lights, whose switching on and off is linked in a certain simple way to the state of their neighbours, are found spontaneously to settle down to one of only a limited number of orderly patterns, rather than continuing to flash haphazardly for ever.

A second feature of chaotic systems is that they are unisolatable. Because they are so sensitive, they can never be insulated from the effect of the environment in which they are located. Therefore they must be discussed holistically, in their total overall context.

ACTIVE INFORMATION AND TOP-DOWN CASUALITY

Putting these two insights together, we can see an ontological approach to interpreting chaos theory would imply additional causal principles of an holistic and pattern-forming kind. One might, in brief, call such a causality "active information" and denote its holistic character by the phrase "top-down causality", meaning the influence of the whole upon its parts. In somewhat differing ways, Arthur Peacocke¹⁸ and I¹⁹ have both sought to explore a little of what might be the value of such speculative, but motivated, ideas for attempts at thinking about divine providential action.

The discussion is balanced between a desire, on the one hand, to attain a degree of intelligibility about what might be involved in God's action in the physical world and, on the other hand, to preserve the distinctive character of deity, resisting too great a degree of assimilation of the divine to the creaturely. One way of meeting the second need, and one which is common to all Christian thinking about God's action, is the recognition of the timeless and transcendent role of the Creator in holding the creation in being, moment by moment of its existence. In Hebrew terms, this is described by the uniquely divine word, *bara*; in theological terms, it corresponds to the concept of

general providence. It makes God party to each event to the extent of the exercise of the divine permissive will in allowing that event to happen, but it does not imply that God actively desires that this should be so. Such sustaining activity has no conceivable human analogue and so it is a clear mark of divine uniqueness.

Our principal concern, however, is with God's immanent actions within unfolding creaturely history and the deliberate results that stem from that. Here the appropriate Hebrew word might appear to be 'asah, the ordinary word for bringing things about. The appropriate theological concept is special providence, God's particular acts on particular occasions and in particular circumstances. These are the actions to which the concept of active information might have some bearing through the supposition of the divine exercise of top-down causality. Here, also, the possibility—and some would say the danger—of inappropriate human analogy has to be reckoned with.

Peacocke and I approach this problem in different ways. He believes that one way of achieving a satisfactory distance between a universal Creator and localised creatures is to treat God as relating to the world-as-a-whole, so that God is a global Agent, in contrast to the local actions of creatures. While God undoubtedly does relate to the whole of creation, yet God surely relates to individual creatures also. It is not clear how the demands of the particularity of personal providence can convincingly be met by some unexplained trickle-down from cosmic interaction.

My strategy has been to locate the Creator/creature distinction in the contrast between God's acting through pure information input, and creaturely acts which involve a mixture of energetic and informational causalities, corresponding to the embodied status of creatures. This idea could be the prosaic translation of theology's poetic insight that God's action is the working of pure Spirit. I believe that such a distinction is tenable because, while passive information storage of the kind discussed by communications theory does exact an irreducible energy tariff for the recording of bits of information, the same is not true for active information. Thus the concept of its pure form, unmixed with energetic causality, is a coherent one.²⁰

Whatever their merits, the aim of these two strategies, Peacocke's and mine, is clear enough. It is to maintain a metaphysical distinction between God's providential agency and the intentional agency of creatures. The purpose is to absolve the proposal from the charge that it has reduced God to the role of being merely a cause among other competing causalities. The Creator, it is supposed, is more fittingly to be thought of as the director of the great cosmic improvisatory play, rather than as an invisible actor on the stage of the universe. It is not possible, however, to remove all unease about how successful either strategy actually is in this regard. The scientist-theologian is caught in a Catch 22 situation. The more explicit the talk about the causal joint by which God acts in the world becomes, the more danger there is that providence becomes just one form of causality among others. Yet, without some such attempt at explication, the idea of providence remains too mysterious for any discussion beyond fideistic assertion.

KENOTIC CREATION

I have recently come to reconsider whether the fundamental theological objection one is trying to meet is as forceful as I had originally supposed it to be. What has caused this revaluation is taking the kenotic nature of God's creative act as seriously as possible. Of course, nothing could reduce talk about the Creator to terms that could bear some valid analogy to creaturely discourse, except that divine condescension had allowed this to be so. The central Christian kenotic paradox of the incarnation centres on just such an act of divine self-limitation, so that God's nature is manifested in the plainest, and most accessible, creaturely terms through the Word's assumption of humanity and consequent participation in human life and human death in Jesus Christ. As the Fathers liked to say,

the Ancient of Days lay as a baby in a manger. The invisible God took our flesh and became a visible actor on the stage of the universe.

If we believe that Jesus is God incarnate then, there in first century Palestine, God submitted in the most drastic way to being a cause among causes. Of course, that was not all that God was doing during that period. Christian theology has never simply equated God with Jesus, nor supposed that the historic episode of the incarnation implied that there was, during its period, an attenuation of the divine governance of the universe. The incarnation does, however, suggest what character that governance might at all times be expected to take. It seems that God is willing to share with creatures, to be vulnerable to creatures, to an extent not anticipated by classical theology's picture of the God who, through primary causality, is always in total control.

This thought is the inspiration for the kenotic view of creation with which our discussion began, the concept that, in allowing the other to be, God allows creatures their part in bringing about the future. There must be an intertwining of providential and creaturely causality. Such an act of divine condescension would seem to correspond precisely to God's loving choice to be, in the unfolding history of creation, an immanent cause among causes.

Twentieth-century exploration of the implication of the kenotic act of creation has progressed in successive stages. The first point to be grasped was the divine self-limitation of omnipotence. Acts of the creaturely other (whether the deed of a murderer or the incidence of a cancer) are allowed to happen, although they are not in accord with God's benevolent will. Secondly there came a recognition that creation might also imply a kenosis of omniscience in that an evolving world of true becoming is one in which even the Creator does not yet know the future, for the future is not yet there to be known.²¹

I am now suggesting further that divine self-emptying extends to a kenosis of the status of agency, so that special providence is exercised as a cause among causes, active within the cloudy unpredictabilities of created process. The picture of the invulnerable, all-powerful God of classical theology has given way to the picture of the God who interacts within creaturely history but does not overrule the acts of creatures.

Divine uniqueness is still maintained in a number of ways. One is God's role in the transcendent sustaining of the world in being, to which reference has already been made. Another will be in relation to miraculous action.²² The latter is not to be understood as God's arbitrary irruption, in a quasi-magical way, into the otherwise smooth history of creation. That would involve the theological nonsense of the God of miracles acting against the same God whose faithful will is the ground of the reliable process of the universe.

Rather, miracle is the revealing by the Creator of the profound potentialities that the divine will has for creation, beyond those so far discerned in the workings of the world. Divine consistency requires that there must be a deep coherence between the already known and the now being revealed. Miracle becomes credible when these two are seen to constitute a fundamental unity. The central and essential Christian miracle of the resurrection of Jesus has just this character. It is not a hasty divine intervention on Easter Day to put right what had got badly out of hand on Good Friday, but the seminal event from which God's new creation has begun to grow, not as the abolition of the old creation but by way of its redemptive fulfilment.²³ (The Lord's risen body is not the replacement of his dead body but its glorification—hence the empty tomb.)

This reminds us of another important aspect of divine uniqueness. God's purposes will eventually be fulfilled. The precariousness involved in the Creator's sharing of causality with creatures may imply

that that fulfilment will be attained along contingent paths, as God responds to the free actions of others, but the God who is the ground of a true and everlasting hope will work ceaselessly to bring salvation to creation. The deep theological problems of grace and free will, and of eschatology, are not to be disposed of in the closing paragraph of a discussion of divine action, but our need to wrestle, as best we can, with the problems of God's agency arises from our religious conviction that God is no deistic spectator of the history of the universe, nor merely the sustainer of its process, but ultimately God will be this universe's Saviour.

John Polkinghorne

NOTES:

1. R. G. Collingwood, *The Idea of Nature* (Oxford University Press, 1945)
2. *Ibid*, **3**
3. See C. Kaiser, *Creation and the History of Science* (Marshall Pickering, 1991) for a more complex account
4. G. Jantzen, *God's World, God's Body* (Darton, Longman and Todd, 1984)
5. *The Oxford Dictionary of the Christian Church*; quoted with approval by A. R. Peacocke, *Theology for a Scientific Age* (SCM Press, 1993), **371**
6. Peacocke, *Ibid*
7. C. Hartshorne, *The Divine Relativity* (Yale University Press, 1948), **90**
8. See R. J. Russell, N. Murphy and C. J. Isham (eds), *Quantum Cosmology and the Laws of Nature* (Vatican Observatory, 1993)
9. J. Moltmann, *The Trinity and the Kingdom of God* (SCM Press, 1981), ch.4; *God in Creation* (SCM Press, 1985), **ch 4**
10. W. H. Vanstone, *Love's Endeavour, Love's Expense* (Darton, Longman and Todd, 1977)
11. I. Prigogine, *The End of Certainty* (The Free Press, 1996); for a recent summary of my thinking, see J. C. Polkinghorne, *Belief in God in an Age of Science* (Yale University Press, 1998), **ch 3**
12. For a summary, see J. C. Polkinghorne, *Scientists as Theologians* (SPCK, 1996), **ch 2**
13. T. Kuhn, *The Structure of Scientific Revolutions* (Chicago University Press, 1970)
14. A. Farrer, *Faith and Speculation* (A&C Black, 1967)
15. See Polkinghorne, *Scientists*, **ch 1**
16. W. G. Pollard, *Chance and Providence* (Faber & Faber, 1958)
17. See R. J. Russell, N. Murphy and A. R. Peacocke (eds.), *Chaos and Complexity* (Vatican Observatory, 1995), articles by N. Murphy and T. F. Tracy
18. Peacocke, *Theology*, **ch 3 & 9**
19. J. C. Polkinghorne, *Science and Providence* (SPCK, 1989), **ch 2**; *Reason and Reality* (SPCK 1991), **ch 3 & ref 11**
20. The argument is defended partly by reference to the somewhat arcane example provided by David Bohm's causal reinterpretation of quantum theory
21. See, for example, Polkinghorne, *Scientists*, **41**; R. Swinburne, *The Coherence of Theism* (Oxford University Press, 1977), **ch 10**
22. Polkinghorne, *Providence*, **ch 4**
23. See J. C. Polkinghorne, *Science and Christian Belief / The Faith of a Physicist* (SPCK/Princeton University Press, 1994), **ch 6 & 9**