Science and the Trinity

The Christian Encounter with Reality

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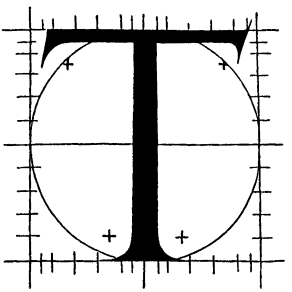
Contents

CHAPTER ONE

Four Approaches to the Dialogue between Science and Theology



THEOLOGY seeks to speak of God, the One who is the source of all created being. Therefore, to some degree theology must take account of all forms of truth-seeking investigation into the nature of what is. Among such enquiries, the discoveries of science are of clear significance as they tell us about the pattern and history of the universe. Theology, in its turn, regards that universe as being God's creation. It is therefore not surprising that the dialogue between theological thinking and the science of the day has had a long history. One may recall that Augustine, in his *Literal Commentary on Genesis*, does not at all produce the kind of flat-footed 'creationist' seven-day account that his title might suggest to a modern reader but, among other things, emphasises that if well-supported contemporary understanding of the natural world appeared to conflict with a traditional interpretation of scripture, then that interpreta-

tion should be reconsidered in the light of this other knowledge.

The form that this interaction between science and theology has taken has varied considerably over the centuries. Certainly it is not possible to subsume it under some single simplistic rubric, such as the 'warfare' of the scientific with the theological or their harmonious conflation with each other. John Hedley Brooke, in his scholarly survey covering the period from the seventeenth century to the end of the nineteenth century,[1] has made clear the variety and the complexity of the historical interaction between science and religion. For the general enquirer, careful consideration of these matters has been hampered by the assiduous propagation of the myth of a battle between scientific light and religious darkness—a misrepresentation particularly popular in those sections of the media that love stories of confrontation.

Someone who has suffered from a campaign of misrepresentation in this respect has been John Calvin. It has become a cliché to quote, as an egregious example of theological blindness to scientific truth, his alleged remark 'Who will place the authority of Copernicus above that of the Holy Spirit?' In actual fact this remark is nowhere to be found in Calvin's writings. It appears to have originated as a plain invention by the nineteenth-century writer F. W. Farrar, who (I regret to have to say) was the Dean of Canterbury Cathedral.[2] The injustice is particularly great since Calvin's idea of accommodation—the concept that the writers of scripture expressed

1. J. H. Brooke, *Science and Religion*, Cambridge University Press, 1991. P. J. Bowler, *Reconciling Science and Religion*, University of Chicago Press, 2001, carries the story into the early twentieth century with similar conclusions.

2. D. Alexander, *Rebuilding the Matrix*, Lion Publishing, 2001, p. 129.

themselves in ways that would be accessible to the common reader of their time—led him to warn expressly against treating the Bible as a quarry from which to attempt to hew scientific conclusions. Calvin wrote in his *Commentary on the Psalms* that 'The Holy Spirit has no intention to teach astronomy . . . the Holy Spirit would rather speak childishly than unintelligibly to the humble and unlearned'.[3] To continue this Anglican acknowledgement of Reformed good sense in thinking about these matters, let me also note that Benjamin Warfield (who founded the lectures that I had the honour to give), writing in the aftermath of what is mythically represented as a paradigm period of great conflict between science and religion, said that, in his opinion, he 'did not think that there is any general statement in the Bible or in any account of creation, either as given in Genesis 1 and 2 or elsewhere alluded to, that need be opposed to evolution'.[4] Finally, we should gratefully recall that one of the leading contemporary theologians to take a sustained interest in how science and theology relate to each other is also from the Reformed tradition. I refer, of course, to Thomas Torrance, whose writing often refers to scientific matters, particularly those associated with his two great scientific heroes, James Clerk Maxwell and Albert Einstein.[5]

Recent years have seen a very active engagement in the dialogue between science and theology, mostly conducted by those whose intellectual formation has been on the scientific side of the border. It is quite customary to date this vigorous

3. Quoted ibid., p. 132.

4. Quoted ibid., p. 201.

5. T. F. Torrance, *Theological Science*, Oxford University Press, 1969; *Divine and Contingent Order*, Oxford University Press, 1981; see also J. C. Polkinghorne, *Faith, Science and Understanding*, SPCK/Yale University Press, 2000, § 8.3.

activity from the publication in 1966 of Ian Barbour's *Issues in Science and Religion*,[6] and there is no doubt that this was indeed a seminal event in terms of its wide influence in the academic world. However, many of the isssues raised in Barbour's book had been anticipated in Eric Mascall's Bampton Lectures of 1956, *Christian Theology and Natural Science*,[7] where their treatment was heavily influenced by the author's Thomistic style of thinking.

Since those days, the mutual conversation between science and theology has intensified and the rate of relevant publication has quickened considerably. The resulting dialogue has proved to be a kind of spiral process, circling ever inwards to deeper engagement with topics of central concern to Christian theology.[8] There are certain natural frontier issues, such as the doctrine of creation, the status of natural theology, and the critique of a crassly reductive physicalism, that will always engage the attention of workers in this field. Yet much of what can be said in respect to these issues is as consistent with the distant God of deism as it is with the God of providential theism who truly interacts with the history of creation. The recognition that this is so has had the effect in the last ten years of bringing to the top of the agenda a more demanding question. It asks in what way one might hope to understand divine providential action to be exercised in the kind of world whose processes are described by the orderly accounts that science seems to offer. No fully agreed consensus has emerged

6. I. G. Barbour, *Issues in Science and Religion*, SCM Press, 1966.

7. E. L. Mascall, *Christian Theology and Natural Science*, Longman, 1956.

8. For discussion of some of the contributors to this dialogue, see J. C. Polkinghorne, *Scientists as Theologians*, SPCK, 1996; *Faith, Science and Understanding*, ch. 8.

from these discussions, but it has been widely recognised that the intrinsic unpredictabilities that twentieth-century physics has uncovered as limits on our knowledge of detailed behaviour, both in quantum theory and in chaos theory, have significantly qualified the kind of merely mechanical account of physical process that previously had seemed to be the deliverance of science.[9] As a result, an honest appeal to science cannot be used to discredit belief in God's providence acting within the divinely ordained open grain of nature. Moreover, if creatures can act as agents in the world (a capacity that human beings directly experience but which itself is not, as yet, well understood in terms of a scientific account of detailed process), it would not seem reasonable to deny the possibility of some analogous capacity in the Creator.

Recently there has been a further twist in this spiralling engagement of science and theology, in that issues of eschatological credibility have become matters of current discussion. Here the main initiative must lie with theology but science can pose, with some sharpness, some of the questions that need to be addressed and it can even, to a minor degree, constrain the form of some of the answers that can be proposed.[10]

One consequence of this increasingly more specific engagement with topics of central theological concern has been to show up more clearly that there are some significant differ-

9. See R. J. Russell, N. Murphy and A. R. Peacocke (eds.), *Chaos and Complexity*, Vatican Observatory, 1995; J. C. Polkinghorne, *Belief in God in an Age of Science*, Yale University Press, 1998, ch. 3. The word 'intrinsic' is important here. No attempt is being made to revive the discredited concept of 'the God of the gaps', supposed to operate within the lacunae of current scientific knowledge and so always liable to vanish with the further advance of that knowledge.

10. J. C. Polkinghorne and M. Welker (eds.), *The End of the World and the Ends of God*, Trinity Press International, 2000; J. C. Polkinghorne, *The God of Hope and the End of the World*, SPCK/Yale University Press, 2002. See also Chapter 6.

ences of approach to the dialogue between science and theology that are present in the thinking of various participants in the conversation. When the principal matters under consideration were the deep intelligibility of the physical world, the anthropically fruitful history of the universe, the evolutionary exploration of inherent potentiality, and the inadequacy of a reductionist theory of quarks and gluons to fulfil the grandiose claim to be a Theory of Everything, it was comparatively easy to discern a considerable degree of unanimity among those who sought to incorporate these insights into a theology of nature. When the matters under consideration came to include such topics as divine providential engagement with the specificities of history, the significance of human personhood, the status of Jesus Christ, and the hope of a destiny beyond death, then much more diverse assessments began to be made concerning how relevant and constraining are scientific conclusions, and how appropriate is a scientific style of thinking, for the theological task of the discussion of these issues. In the light of these developments, I want to re-examine the range of approaches that have come to be pursued in the contemporary dialogue between science and theology.

In his Gifford Lectures,[11] Ian Barbour offered a taxonomy of the different ways in which he saw that it had proved possible to relate science and religion. His scheme has become something of a classic grid which has been used by many subsequent writers on the subject. Barbour's fourfold classification employs the headings of Conflict, Independence, Dialogue and Integration.[12] Conflict corresponds to the uncom-

11. I. G. Barbour, *Religion in an Age of Science*, SCM Press, 1990, ch. 1.

12. This is worked out in relation to specific topics in I. G. Barbour, *When Science Meets Religion*, HarperCollins, 2000.

promising choice demanded by those who believe that either science or religion must be the sole occupant of the intellectual driving seat. The contradictory stances of scientism and creationism (the latter word understood in its curious North American literalist sense) meet here in agreeing that a choice has to be made that will then commit one to being wholly intolerant of any other point of view. Independence presents us with a far less drastic option. Science and religion are considered to use different languages, to pose different questions, to consider different dimensions of experience, and generally to operate insulated from one another. This division is quite often presented in terms of a dichotomy that separates the domains of public knowledge (science) and private opinion (religion), or by way of a similar distinction between a concern with facts and a concern with values. Independence is a popular stance for scientists who do not want to dismiss religion altogether, but who equally do not want to worry very much about its truth claims.[13]

The stances of Dialogue and Integration both take a much more positive view of the possibility of fruitful exchange between science and theology. The former believes that the two disciplines have things to say to each other. For example, both offer insights into the nature of cosmic history. Their perspectives are different and there is no direct entailment between them, but nevertheless one can reasonably expect the two sets of insights to exhibit some degree of compatibility with each other. It is in this mode that many would consider that the idea of evolutionary process and the concept of continuous creation can be seen as mutually enlightening. Inte-

13. See, for example, S. J. Gould, *Rock of Ages*, Ballantine, 1999.

gration seeks a much closer degree of engagement, such as would be proposed, for instance, in the synthetic thinking of Teilhard de Chardin,[14] or in the metaphysical scheme of process thought.[15]

Most serious contributors to the dialogue between science and theology reject both the head-on collision of Conflict and the mere talking past each other of Independence. Both of these approaches are seen as being either inadequate or misleading. Attention, therefore, has concentrated on the mediating ground of interactive encounter. In his own thinking, Barbour acknowledges that he uses a combination of the two stances of Dialogue and Integration that he has described.[16] Other writers have sought to delineate the frontier exchange in somewhat different ways.

John Haught produced an alliterative scheme using the concepts of Conflict, Contrast (similar to Independence), Contact and Confirmation.[17] The stance of Contact acknowledges that science and theology interact with each other and that, in consequence, new scientific discoveries can exert an influence on theological thinking. An instance would be the impact that biological evolution and Big Bang cosmology have had on the way that theologians talk about the doctrine of creation. The stance of Confirmation makes the bolder claim that 'religion, without in any way interfering with science, paves the way for some of its ideas, and even gives a special kind of blessing . . . to the scientific quest for truth'.[18] This possibility

14. P. Teilhard de Chardin, *The Phenomenon of Man*, Collins, 1959.

15. A. N. Whitehead, *Process and Reality*, Free Press, 1978; P. A. Schilpp (ed.), *The Philosophy of Alfred North Whitehead*, Open Court, 1971.

16. Barbour, *Religion in an Age of Science*, p. 30.

17. J. Haught, *Science and Religion*, Paulist Press, 1995.

18. Ibid., p. 4.

might be illustrated by the claim, made by some historians of ideas,[19] that it was the Judaeo-Christian-Islamic concept of a creation whose order had been freely chosen by its rational Creator that provided an important element in the intellectual setting that enabled modern science to come to birth in Europe in the seventeenth century.

In my turn, I have sought to redescribe Barbour's two forms of constructive encounter in terms of the categories of Consonance and Assimilation. The former refers to the way in which 'science does not determine theological thought but it certainly constrains it' by conditions of mutual congruence. In contrast, the category of Assimilation refers to attempts 'to achieve a greater merging of the two disciplines'.[20] I am suspicious of this latter approach, since I believe that it tends to result in science playing too great a controlling role in the proposed convergence, with the result that there is a danger that theological concerns become subordinated to the scientific. I fear this effect much more than Barbour does, and hence my choice of a less complimentary term to describe the synthetic exercise.

More recently, a group of younger scholars came together with the intention of formulating a revisionary approach to these issues. They were influenced by what they saw as the postmodern state of cognitive pluralism, with its suspicion of all attempts at an overarching meta-narrative. For these reasons, the group sought to go beyond the ideas of the scientist-theologians of my generation. Appropriately enough, no single agreed theme emerged and their joint volume expounds

19. See, for example, S. Jaki, *The Road of Science and the Ways to God*, Scottish Academic Press, 1978; C. A. Russell, *Cross-Currents*, Inter-Varsity Press, 1986.

20. Polkinghorne, *Scientists as Theologians*, pp. 6–7.

a variety of contrasting views.[21] The spread of the options offered is wide, ranging from Willem Drees's reliance on scientific naturalism, which only permits theology a peripheral role as the possible source of answers to limit questions, to the contributions of the two editors, Niels Gregersen and Wenzel van Huyssteen, who present less drastic proposals, based on the concepts of contextual coherence and post-foundational rationality respectively. The former approach uses coherence, evaluated within a general web of beliefs and knowledge and exercised in a pragmatically effective way, as its critical norm, while the latter envisages a flexible, multi-dimensional concept of rationality, located within the context of living and developing traditions. The total offering of the six contributors is of considerable interest, but it is too diverse for short summary. I have to say that personally I remain persuaded of the validity of a carefully nuanced critical realism in both science and theology. It seems to me that a number of the points made by its critics are more in the nature of an exploration of what might be involved in understanding the qualifier 'critical', rather than amounting to a negation of the concept itself. As the present volume illustrates, I am unwilling to relinquish the grand scheme of Trinitarian theology, anchored in the narratives of the canonical tradition.

I have come to believe that the increasing theological sophistication of the interaction between the two disciplines means that a different kind of classification is now needed, making somewhat finer distinctions that relate not only to the methods of discourse employed but also to the content of what

21. N. H. Gregersen and W. J. van Huyssteen (eds.), *Rethinking Theology and Science*, Eerdmans, 1998.

is allowed to enter into the mutual conversation. The principal purpose of this chapter is to explore a fourfold discrimination of the different kinds of positive interaction that have actually been taking place. In the course of the discussion I shall make illustrative use of the ideas of four contributors to the science-theology dialogue whose work seems, respectively, to fall into these four categories. The scheme I propose is essentially theological, rather than methodological, in its character. The first of its categories is:

(1) *Deistic.* The adjective is justified because the degree of engagement between science and theology that is envisaged in this approach is modest, with the initiative coming mainly from the scientific side. The core of the strategy is the recognition that there are significant questions that arise from the experience of doing science, but their character is such that answering them requires a move outside of science itself. If these meta-questions are to be addressed, the resource for doing so must therefore be more than purely scientific. It is then suggested that the concept of some form of Cosmic Intelligence, of the kind that the God of deism would represent, is a rationally coherent possibility that should be taken into account by those who are seeking a maximal degree of understanding.

The questions that give rise to this kind of argument generally centre on two topics. One is the character of the laws of nature. From a purely scientific standpoint, these are the scientific givens that are discovered to be acting in the universe and which serve to define the character of its physical fabric. Science does not explain their origin but simply uses them as the basis for its discussion of the detailed character of physical and biological process.

Every discipline has to rest on an unexplained founda-

tion. For science this is provided by the fundamental laws of nature, just as theology rests on the given existence of the deity conceived, for example, as a maximal necessary being. Nothing comes of nothing, and no explanatory scheme can be totally self-explanatory, as if it were totally free from any unexplained input. In forming our view of reality, David Hume would encourage us to take our stand on the ground that treats the given properties of matter as the basis for all explanation. However possible such a materialist stance might have seemed in the eighteenth century, at the beginning of the third millennium, physical scientists, in particular, are apt to discern in the laws of nature a character that is highly suggestive that there is more to learn about them than unaided science can find the means to say. Hume's scientistic strategy appears unappealing. A move beyond science then becomes a possibility to be explored (see also Chapter 3).

For one thing, there is the fact of the profound intelligibility of the universe that has made its laws actually accessible to us, so that whether it is quantum theory's account of the subatomic world, or the account that general relativity gives of the vast domains of cosmic curved spacetime, we are able to understand regimes that are remote from everyday experience and whose character demands highly counterintuitive ways of thinking if we are properly to comprehend them. Moreover, mathematics—that apparently most abstract of human activities—turns out to provide us with the key to unlock these physical secrets. And it is not just any old mathematics that fulfils this revelatory task, but the kind whose equations are endowed with the unmistakeable character of mathematical beauty. The fundamental structure of the universe is astonishingly rationally transparent to us, thereby affording science

the possibility of making its discoveries. The universe is also rationally beautiful, thereby affording scientists the reward of wonder as the recompense for all their demanding labour. Are all these matters just our luck, or are they signs that there is a divine Mind that lies behind the marvellous order of the cosmos?

Meta-questioning of the laws of nature does not end there, for there is also the remarkable fact that it is their quantitative specificity that alone has allowed the development of carbon-based life in the course of cosmic history. While that history has been characterised by evolutionary exploration of potentiality, the process only resulted in such fruitful consequences as human beings because it took place in a context that was, so to speak, 'finely tuned' to permit the possibility of carbon-based life developing. The detailed character of the physical fabric of the world was of critical importance and had to be tightly constrained. There has been much discussion of what should be made of these Anthropic Principle considerations, but they certainly raise metaphysical questions to which belief in God can provide, at the least, an economic and coherent answer.[22]

The second topic that has attracted much attention has been the coming to be of self-conscious life, surely one of the most remarkable developments known to us in the fourteen-billion-year history of the cosmos. In the dawning of rational self-awareness, the universe began to come to know itself, and thereby science became a future possibility. To many people this does not look like just an incredibly happy accident.

22. See J. D. Barrow and F. J. Tipler, *The Anthropic Cosmological Principle*, Oxford University Press, 1986; J. Leslie, *Universes*, Routledge, 1989.

One contributor to the dialogue between science and theology whose thinking has been almost entirely confined to these issues is Paul Davies.[23] His thought is largely science-driven and theological considerations play a distinctly subordinate role in it, a fact that enables Davies to make his somewhat notorious comment that, in his opinion, 'science offers a surer path to God than religion'.[24] It is, of course, the etiolated God of deism—the Cosmic Architect or the Great Mathematician—who is, at best, the endpoint of this kind of argument. *God and the New Physics* concludes with the picture of a deity who is a kind of ingenious demiurge.[25] In a later and more developed book, *The Mind of God*, Davies admitted that it was not obvious to him that 'this postulated being who underpins the world has much relationship to the personal God of religion, still less the God of the bible or the Koran'.[26] One is reminded of Albert Einstein, who liked to use talk about God as a kind of cipher for the rational order of the universe, but who vigorously repudiated belief in a personal God, saying that if he had a God it was the (pantheistic) God of Spinoza.[27]

Davies ends *The Mind of God* by stating,

> I cannot believe that our existence in this universe is a mere quirk of fate, an accident of history, an incidental blip in the great cosmic drama. Our involvement is too intimate. . . . Through conscious beings the universe has generated self-awareness. . . . We are truly meant to be here.[28]

23. P. Davies, *God and the New Physics*, Dent, 1983; *The Mind of God*, Simon and Schuster, 1992.
24. Davies, *God and the New Physics*, p. ix.
25. Ibid., ch. 17.
26. Davies, *The Mind of God*, p. 191.
27. M. Jammer, *Einstein and Religion*, Princeton University Press, 1999.
28. Davies, *The Mind of God*, p. 232.

Davies' thinking illustrates both the possibility of a stand-alone natural theology and also its theological thinness. Thomas Torrance is surely right to insist that natural theology must be integrated with the rest of the discipline of theology in the single search for the knowledge of God, if the theological enterprise is to prove to have sufficient richness and depth.[29] All possible resources for insight must be drawn into play. It is not enough to recognise the significance of persons simply in terms of their self-awareness; they must also be regarded as perceivers of value and as participants in the religious encounter with the reality of the sacred. There is also a dark side to human nature that must be acknowledged, that corruptive influence that theologians consider under the category of sin.

The God of deism ultimately proves too diminished a deity for the question of that kind of divine existence really to seem to matter all that much. Hence the decay that one can trace historically in the course of eighteenth-century rational religion, moving from natural theology to natural philosophy and then on to atheism itself.[30]

(2) *Theistic.* In actual fact, almost all believers in God are adherents of a particular faith tradition, though no doubt with a variety of degrees of commitment to the core of their tradition. The individual person of general but unanchored theistic inclinations, such as Paul Davies, is a rather unusual case. Most belief stems not only from metaphysical argument but also from the experience of worship and practice within a religious community. Of course, this observation immediately raises all the perplexities inevitably associated with the great diversities

29. T. F. Torrance, *Theological Science* and *Reality and Scientific Theology*, Scottish Academic Press, 1985.

30. M. Buckley, *At the Origins of Modern Atheism*, Yale University Press, 1987.

of belief exhibited by the world faith traditions in their accounts of the nature of the sacred. Here is both a problem and a potential for future theological discourse—a problem because of the apparent cognitive dissonance, and a potential because of the rich diversity of insight and experience expressed and preserved. I regard this interfaith issue as one of the most important subjects on the theological agenda at the start of the third millennium,[31] and I shall have a little more to say about it in the Postscript. Meanwhile I must confine my discussion to what has been going on within Christianity.

The ways in which a religious tradition impinges upon theological reflection can be quite diverse. While the believing community will provide the general context for theological discourse, there are a variety of manners in which specific issues might be engaged. This section, and the two sections that follow, illustrate this sort of diversity within the context of a Christian concern for the issues of science and religion.

By a theistic approach pursued within the Christian context, I mean one that is genuinely influenced by a Christian style of thought and experience, but which does not necessarily come to grips with a fully articulated range of doctrinal issues, such as those that are laid out in the articles of the Nicene Creed. A theistic approach of this kind will not at all be content with natural theology alone. It will draw inspiration from the Bible, and in particular from the life and words of Jesus of Nazareth. It will be concerned with how one may understand divine providential action to be exercised in the

31. See J. C. Polkinghorne, *Science and Christian Belief/The Faith of a Physicist*, SPCK/Princeton University Press, 1994, ch. 10; *Scientists as Theologians*, ch. 5; *Science and Theology*, SPCK/Fortress, 1998, ch. 7.

history of the world and how one may understand the practice of petitionary prayer, but it may, in the end, be somewhat reserved about exactly what responses should be given to these questions. It will be a theological activity that is influenced by the experience of worship and which values the collective insights of the Christian community, but it will allow itself a good deal of freedom about how it actually makes use of the resources of the tradition.

My example of someone who operates largely in a theistic mode is Ian Barbour. No one could fail to see that his thinking is contained within the envelope of Christian understanding. He makes use of a variety of general biblical concepts and in particular he lays stress on the cross of Christ as the outstanding exemplification of the power of suffering love. For Barbour, relationship and history are the most important categories for theological discourse and he is much influenced by the inspirational Christology of Geoffrey Lampe.[32] In Barbour's view, 'What was unique about Christ, in other words, was his relationship to God, not his metaphysical "substance" '. He suggests 'that in an *evolutionary perspective* we may view both the human and divine activity in Christ as a continuation and intensification of what had been occurring previously. We can think of him as representing a new stage in evolution and a new stage in God's activity'.[33] This implies, as Barbour acknowledges,[34] that what is special about Jesus is a matter of degree. One might say that Jesus was better at being truly human than the rest of us have succeeded in being. If that is a fair way of putting it, it would seem that Jesus is

32. G. W. H. Lampe, *God as Spirit*, Oxford University Press, 1977.
33. Barbour, *Religion in an Age of Science*, pp. 210–11, his italics.
34. Ibid., p. 213.

an inspiring example but he does not act as our redeeming Saviour. Although Barbour quotes the words of Paul, 'God was in Christ reconciling the world to himself' (2 Corinthians 5:18), it seems that they are to be understood in a purely exemplificatory sense. Yet an adequate account of the soteriological role of Christ, so strongly testified to by the Church from the very first, is surely an indispensable criterion of a fully adequate Christology. Affording an example does not seem to be enough, for we stand in need of a source of the grace that will enable human beings actually to follow that example. The *imitatio Christi* is not something that we can do just on our own.

In relation to central Christian dogmas in general, Barbour is often content to summarise what has been said by others and to be somewhat reticent about what he himself thinks. This tendency is particularly notable in respect to Christ's resurrection, to which there are very few references of any kind in Barbour's corpus. For much Christian thinking, both contemporary and traditional, the resurrection is the hinge on which Christian understanding pivots. If Jesus was indeed raised from the dead that first Easter day, never to die again but to live an exalted life at the right hand of God the Father, then there is indeed something uniquely significant about him, going beyond anything that could be considered as 'a continuation and intensification of what had been occurring previously'.

The other aspect of Barbour's thinking that is particularly striking is the role that is played in it by a metaphysical understanding derived from process philosophy. He is the leading proponent in the science and theology community of

that particular way of thinking. Personally, I have two principal problems with process thought. One is that its event-dominated metaphysics does not seem consonant with the physical basis provided by modern quantum theory, which assigns at least as important a role in physical process to continuous development as it does to discontinuous change, the latter occurring only intermittently at moments of measurement. My other problem is that the God of process theology is too metaphysically limited, constrained to act through persuasion alone. Such a conception of deity falls short of describing a being who could be the basis of an everlasting hope. Certainly, the process God does not seem to be the One who could have raised Jesus from the dead. Barbour is frank enough to confess that 'Process theology does call in question the traditional expectation of *an absolute victory over evil*'.[35] I also have to say that the persuasive lure of the God of process theology seems to be soteriologically insufficient, for the human condition is such that we need empowerment as well as encouragement. God must will the means as well as the desirability of our salvation. Hence the Christian concern with grace given to us (cf. Romans 7:15–25).

There is nothing at all improper in theology operating in tandem with a chosen philosophical system. One thinks of the influence of neo-Platonism on Augustine, or of the newly recovered philosophy of Aristotle on Aquinas. Yet, despite all its bold creativity, process thought does not seem to sit easily with much Christian insight into the Creator's ways with creation. That said, one must gladly acknowledge that there is a much greater richness in the theistic approach of the kind

35. Ibid., p. 264, his italics.

that I see Barbour as exemplifying than is to be found in the theologically thin account of Davies' deistic approach. There is, however, still the question of whether there might not be even richer approaches, capable of leading to deeper and more exciting conclusions, that also need to be taken into account. Two such stances remain to be considered.

(3) *Revisionary.* This third attitude corresponds to an approach which engages extensively with the range of topics that have been the traditional concern of Christian theology, but which also believes that the way in which these topics are to be treated requires radical revision in the light of modern knowledge and, in particular, as a result of scientific discovery. Such an approach will lead to much talk about Christology and about Christ's resurrection, but it will not hesitate to speak on these issues in a manner that is distinctly different from that which has been employed in the past. My representative figure for this way of treating the dialogue between science and theology is Arthur Peacocke.

Peacocke has always maintained the right of theology to speak with its own distinctive voice. He believes that theology 'refers to the most integrated level or dimension we know in the hierarchy of relations [within reality]. So it would not be surprising if the concepts and theories which are developed to explicate the nature of this activity are uniquely specific to and characteristic of it'.[36] As a very positive example of the way in which scientific understandings have influenced theological discourse, one might take the way in which Peacocke has made such helpful use of evolutionary insight to encourage a theological concept of *creatio continua* as a way of reflecting on the

36. A. R. Peacocke, *God and the New Biology*, Dent, 1986, p. 30.

process by which creatures have been allowed to explore and realise the potentiality with which creation has been endowed by its Creator.[37]

When one comes to Christology, however, a more mixed and confusing form of discourse seems to be in evidence. Peacocke sometimes speaks in terms strongly reminiscent of Barbour's way of thinking. He believes that we are encouraged 'to understand the "incarnation" which occurred in Jesus as exemplifying that emergence-from-continuity which characterises the whole process by which God is creating continuously through discontinuity'.[38] Peacocke lays great stress in his work on the transformative power of divine communication. This leads him to believe that 'what we have affirmed about Jesus is not, in principle, impossible for all humanity'.[39] Once again one faces the soteriological problem of whether the example of this 'new emergent'[40] that Jesus is felt to represent is sufficient to help those who have so far failed to emerge. It would seem that communication (*gnosis*, one might even say) is not the same as grace (participation in the divine life and energies).

Yet, at other times, Peacocke, speaking of the cross of Christ, can say that we have to conclude that '*God* also suffered with him in his passion and death'.[41] If this refers to a true divine participation in the travail of creation, it seems to

37. A. R. Peacocke, *Creation and the World of Science*, Oxford University Press, 1979, chs. 2 and 3; see also the essays in J. C. Polkinghorne (ed.), *The Work of Love*, SPCK/Eerdmans, 2001.

38. A. R. Peacocke, *Theology for a Scientific Age*, enlarged edition, SCM Press, 1993, p. 301.

39. Ibid., p. 302.

40. Ibid., p. 303.

41. Ibid., p. 310, his italics.

demand something much more like a traditional ontological understanding of the incarnation, so that in Christ God is indeed caught up in the sufferings of creation from the inside, and not simply alongside. The statement then seems to stand in unresolved tension—even contradiction, one might feel—with the language of an inspirational or functional Christology that has preceded it.

In his discussion of the resurrection, Peacocke shows a preference for the kind of language of exaltation that one finds in the Epistle to the Hebrews. He sees the resurrection appearances as 'referring to a new kind of reality hitherto unknown because not hitherto experienced'.[42] In relation to the stories of the empty tomb, however, he expresses considerable reservations. One reason for this caution is that Peacocke believes that, since in our case the molecules of our bodies will soon be dispersed and recycled after our deaths, the direct transmutation of Christ's corpse into his glorified body on the third day would serve as a poor precedent for the destiny of the rest of humanity. This supposed difficulty seems to rest on a failure to distinguish between a kind of crude resuscitatory realism that would interpret resurrection as the literal restoration of what had previously been (an idea that I too would certainly reject, not least because the atoms of our bodies have no abiding significance, for they are changing all the time), and the significance of Christ's resurrection as the wholly novel and seminal event from which God's new creation has begun to grow and which prefigures the ultimate redemption of all creation, matter as much as humanity. In my own thinking about the resurrection I attach credi-

42. Ibid., p. 281.

bility and theological importance to belief that the tomb was empty.[43]

In an earlier survey of the thinking of three scientist-theologians, I placed Peacocke between myself and Barbour in terms of the consonance-assimilation spectrum that I was then using. My judgement was that he appeared at times 'to operate in an assimilationist mode and at other times in a consonantist mode'.[44] Since then Peacocke, in an article in *Zygon* that has a strongly programmatic tone to it, has declared himself in terms that are much more unambiguously those of a radical revisionary. Beginning with the metaphor of a bridge between science and theology, he asserts that in medieval times 'one had to change vehicles halfway across the bridge as reason was left behind and the deliverances of a revealed faith took over in going from science to religion'.[45] That alleged abandonment of the usage of rational discourse seems a curious verdict on an age that was deeply concerned with questions of logic. It is also a curious verdict on the thought of someone like Thomas Aquinas, who believed that the mind seeks truth without reserve and whose dialectic method in the *Summa Theologiae* is to consider arguments both for and against the proposition being considered. At any time in Christian history, what in fact changed in crossing the bridge was not the reasonable appeal to motivated belief, but rather the kind of experience that can appropriately be invoked in seeking that motivation. The distinction made in Aquinas between reason

43. Polkinghorne, *Science and Christian Belief/The Faith of a Physicist*, pp. 115–18, 164.

44. Polkinghorne, *Scientists as Theologians*, p. 84.

45. A. R. Peacocke, 'Science and the Future of Theology: Critical Issues', *Zygon* 35 (2000), p. 120.

and faith does not relate to the acceptance or abandonment of rationality, but to the evidential sources on which a reasonable discussion can draw. It relates to the distinction between natural theology (with its reliance on general human experience) and revealed theology (with its reliance on specific acts of divine self-disclosure). In my view, the theological community has been quite as much a truth-seeking community as the community of science.

In his *Zygon* article, Peacocke then turns to the effects of the contemporary postmodernist critique. He believes that science can survive this in a way that is denied to theology. Part of his defence of this thesis lies in an appeal to evolutionary epistemology. Despite some other notable defenders of this strategy,[46] it seems to me too weak a support even for science, by itself failing to provide a credible basis for claiming the reliability of such macro-remote and counterintuitive subjects as quantum physics or relativistic cosmology. Better grounded is Peacocke's appeal to inference to the best explanation (IBE).

I see the latter strategy as being as much exercised in theology as in science and I would answer Peacocke's question, 'Dare theology, by using IBE, enter the fray of contemporary intellectual exchange and stand up and survive in its own right?'[47] with a definite 'Yes'.[48] In contrast, he fears that current theological practice relies principally on an authoritative book, an authoritative community and an appeal to a priori truth. So fideistic an account would seem to be something of a

46. See W. van Huyssteen, *Duet or Duel?*, SCM Press, 1998, ch. 3.

47. Peacocke, 'Science and the Future of Theology', p. 130.

48. See Polkinghorne, *Faith, Science and Understanding*, chs. 1–3, and the approach of my Gifford Lectures, *Science and Christian Belief/The Faith of a Physicist*.

caricature. There then follows an interesting and detailed set of fourteen points that Peacocke believes to be essential for the new theology of the future. Many of these points refer, in fact, to issues that would be widely recognised as being on the contemporary theological agenda, whatever approach one took to the framing of theological discourse with science and with wider culture. They include such matters as the challenge presented by a monistic view of created reality; human beings seen as 'rising beasts' rather than 'fallen angels'; the possible theological implications of extraterrestrial life; God's relationship to time.

Yet there are other points that are intended to be a challenge to traditional Christian thinking. The assertion that 'the historical evidence for miracles is usually inadequate to testify to them' leads to the suggestion that theology should rid itself of dependence on ideas of the 'disruption of nature by God'.[49] Yet that Humean way of thinking about the miraculous is theologically very unsophisticated, for miracles are properly understood not as arbitrary divine acts, but as insights into a deeper rationality present in the divine relationship with creation than that which can be discerned through ordinary events.[50] Peacocke couples this discussion with a call to reassess the virginal conception and the bodily resurrection of Jesus.

To take another point, one may well agree that redressing the imbalance present in classical theology between divine transcendence and divine immanence is a desirable correction, but it is by no means evident that the best or only way to do

49. Peacocke, 'Science and the Future of Theology', p. 134.
50. J. C. Polkinghorne, *Science and Providence*, SPCK, 1989, ch. 4.

so is to embrace 'sacramental panentheism',[51] the notion that the world is in some way included within God.

I shall return to many of these matters as the argument of the book develops. The point at issue between the revisionary approach and the fourth possibility to be discussed below is not whether new scientific insights will have the possibility of influencing theology, or whether it is the case that each generation will have to make the fundamentals of the tradition its own in its own way, for many of us are revisionists in a more modest mode and theology has never been a purely static discipline. The essential issue is whether substantial new thinking in theology can satisfactorily be achieved largely in disconnection with past understanding. There is always the danger that the gusting of the *Zeitgeist* might wrongly be mistaken for the wind of the Holy Spirit.

(4) *Developmental.* This approach pictures the interaction between science and theology as a continuously unfolding exploration rather than a process of radical change. Although there are cousinly analogies between science and theology in their common search for truth (such as appeal to inference to the best explanation), there are also significant disanalogies. One of the most important of these is that theology does not share in the cumulative character that science displays. Scientific understanding of a well-winnowed and well-defined regime attains a stability that means that it will not require further revision or amplification unless the boundaries of that regime are crossed. Newtonian mechanics is still good enough

51. Peacocke, 'Science and the Future of Theology', p. 134; for a critique, see Polkinghorne, *Faith, Science and Understanding*, § 5.3; for an even stronger emphasis on sacramental panentheism, see C. Knight, *Wrestling with the Divine*, Fortress, 2001.

to get an explorer satellite to Mars, though it will need to be replaced by general relativity for motion in the neighbourhood of a black hole. Science conquers territory over which it then holds permanent sway. Consequently it is synchronic in its character, able to concentrate on the contemporary state of understanding.

Most humane disciplines, however, because of the complexity and subtlety of their subject matter, do not enjoy this kind of cumulative attainment. In consequence, their discourse cannot be confined simply to some present state of the art, but has to range over more than contemporary insights. There is no presumptive superiority of the twenty-first-century theologian over theologians from the fourth or sixteenth centuries, any more than there is a presumptive superiority of twenty-first-century art or literature over that of preceding centuries. Different generations gain different forms of spiritual insight and we have to be humble enough to be willing to apprentice ourselves to the past in a manner that is not necessary in science. As a result, theology is a diachronic discipline, for which dialogue across the centuries is an indispensable resource, not least as a means of release from the possible constrictions of a purely contemporary perspective. Karl Barth wrote that

> We cannot be in the church without taking responsibility for the theology of the past as much as for the theology of the present. Augustine, Thomas Aquinas, Luther, Schleiermacher and all the rest are not dead but living. They still speak and demand a hearing as living voices, as surely as we know that they and we belong together in the church.[52]

52. Quoted in A. E. McGrath, *Nature 1*, T&T Clark, 2001, p. xv.

To acknowledge the truth of this is not to put oneself in unthinking thrall to the past, as Peacocke seems to fear, but to make the fullest use of the resources available for theological progress. Of course, in the twenty-first century, as in every century, people have to appropriate these resources in their own way, and by doing so the insights from the past will be modified and qualified. Yet the change will be evolutionary rather than revolutionary, so that the adjective 'developmental' is the right one to apply to the process. After all, this is just what one might expect to be the case as a result of the continuing work of the Holy Spirit, guiding and leading the Church into further truth (John 15:26; 16:12–14). It would be very surprising if what Christian belief is really all about only came to be realised in our time, just as it would also be very surprising if previous generations had already so perfectly comprehended Christian truth for there to be nothing left for us to do but passively accept their conclusions.

It is the developmental approach that has been the stance that I have sought to adopt in my contributions to the dialogue between science and theology. In the introduction to my Gifford Lectures, I stated that I sought a 'basis for Christian belief that is certainly revised in the light of our twentieth-century insights but which is recognisably contained within an envelope of understanding in continuity with the developing doctrine of the Church throughout the centuries'.[53] I described the method to be employed as 'bottom-up thinking', an abductive strategy that seeks to take the record of experience as the basis for the search for understanding. Such a quest for motivated belief seems to me to be of a kind that

53. Polkinghorne, *Science and Christian Belief/The Faith of a Physicist*, p. 8.

responds to Peacocke's challenge that theology should 'enter the fray of contemporary intellectual exchange'. It certainly has the character of inference to the best explanation. I sought in the course of those Gifford Lectures to consider motivations for Nicene Christian belief, stating my conclusion that 'the Nicene Creed provides us with the outline of a rationally defensible theology which can be embraced with integrity as much today as when it was first formulated in the fourth century'.[54] One of the reasons why that claim can be made is that the condensed character of the Creed means that it indicates the heads of an adequate Christian discourse, without prescribing all the details of how that discourse must be conducted. Much the same can be said about the Christological Definition of Chalcedon, which stakes out a ground within which it believes the understanding of the Church's experience of Christ must be located, without attempting to mark a single point from which to deviate would be seriously heretical. Orthodoxy is not inflexibility.[55]

A comparison between the way in which these last three approaches function within Christian thinking can be made by seeing briefly how they influence consideration of the question of the virginal conception of Christ. Barbour does not discuss the matter at all, but Peacocke and I have both paid attention to the issue.[56] We agree that the evidential testimony

54. Ibid.

55. There is a connection between these thoughts and John Henry Newman's concept of the development of doctrine, but I would always want to find a scriptural seed from which the subsequent elaboration of understanding had grown. In my view, the Marian dogmas fail this test.

56. Peacocke, *Theology for a Scientific Age*, pp. 275–79; Polkinghorne, *Science and Christian Belief*, pp. 143–45; *Scientists as Theologians*, pp. 78–80.

offered in the New Testament is far weaker than the corresponding testimony to the resurrection, so that for both of us the central issue to be resolved is that of the relevance of a criterion of theological coherence to the assessment of the claim. Peacocke begins his consideration with a long discussion of where Jesus' Y chromosome could have come from. (As a woman, Mary would only have had X chromosomes.) This is really a restatement in modern form of the ancient understanding that if the virginal conception actually took place its character was miraculous rather than natural. Peacocke then questions whether this exceptional status would not deprive Jesus of identification with the rest of us who have been naturally conceived. This is a very serious point, for we both agree that Christian theology demands that Jesus is to be understood as being fully and truly human. I cannot see why this is not fulfilled by Jesus having a human genome, whatever its origin might have been. To suppose the contrary would be an instance of the so-called genetic fallacy, that nature is determined by origin. In any case, the total humanity of Jesus is most clearly demonstrated by the way in which he shared absolutely in human death, even to the point of reluctance at its approach (Gethsemane: Mark 14:32–42 etc.) and to a feeling of God-forsakenness in the darkness of the end (Mark 15:34; Matthew 27:46). Of course, Jesus' death was followed by the uniqueness of Jesus' resurrection on the third day, but it is important that this was not immediate, for between Good Friday and Easter is the silent grave and real death of Holy Saturday.[57] Moreover, Jesus' resurrection within history is to be understood as the anticipation and guarantee of what awaits

57. See A. K. Lewis, *Between Cross and Resurrection*, Eerdmans, 2001.

all humanity beyond history: 'as all die in Adam, so all will be made alive in Christ' (1 Corinthians 15:22).

For me the central issue relating to the virginal conception is different, focusing on whether this story, whose symbolic significance is clear enough (the combination of divine initiative and human participation in the coming-to-be of Jesus), is also properly required theologically to be an *enacted* story. Since I see the whole force of Christian incarnational belief as deriving from the fusion of the power of symbol with the power of actual history, I am prepared to believe that the virginal conception actually took place, as the inception of the salvific episode of true divine sharing in the life of humanity. The difference between the revisionary and the developmental approaches may often be found to lie in the differing ways in which they estimate the relative importance of scientific expectation and theological interpretation in weighing the probability of specific beliefs. I believe that Christian salvific symbols are never merely free-floating, but always anchored in actual occurrence, a principle that one might call sacramental.

Lastly, I realise that it may seem strange that my four typical thinkers have all been people whose background is scientific rather than theological. Does this just illustrate the parochiality of the scientist-theologian? I do not think so. While there are certainly theologians who take an interest in the dialogue with science,[58] their writing is often concerned with largely methodological issues and shows little sustained

58. The contributions of Wolfhart Pannenberg and Thomas Torrance are discussed in Polkinghorne, *Faith, Science and Understanding*, pp. 156–85.

engagement with the content of the natural sciences. I believe that such a content-based consideration is indispensable. At the same time, I am sure that the insights and questions that mainstream theologians could bring to the conversation would be of great value. I hope that in the future there will be a fifth approach, of a kind that one might label 'Systematic'.