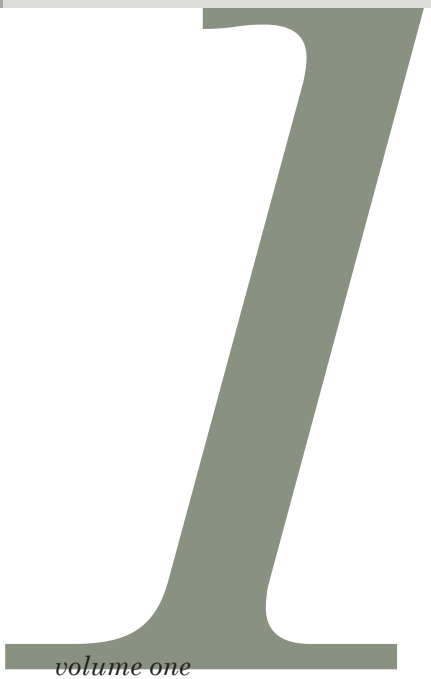
A SCIENTIFIC THEOLOGY: NATURE

T&T CLARK THEOLOGY



volume one

ALISTER E. McGRATH

t&t clark

A SCIENTIFIC THEOLOGY

VOLUME I

NATURE

A SCIENTIFIC THEOLOGY

VOLUME I

NATURE

Alister E. McGrath

Published by T&T Clark

A Continuum imprint

The Tower Building, 11 York Road, London SE1 7NX
80 Maiden Lane, Suite 704, New York, NY 10038

www.continuumbooks.com

First published 2002
This edition published 2006

EISBN 9780567031228

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library

Typeset by Waverley Typesetters, Fakenham, Norfolk

FOR

THOMAS F. TORRANCE

A SCIENTIFIC THEOLOGIAN

Contents

PART TWO: NATURE

Preface

This trilogy had its origins in the long, hot and dry European summer of 1976. I was working at the University of Utrecht in the Netherlands, combining mastering the complex isolation of a protein thought to be implicated in phosphatidylcholine transport between biological membranes (which had been pioneered at Utrecht) with following through my continuing interest in the history and philosophy of the natural sciences, making use of Utrecht's excellent libraries.

I cannot recall quite how the idea came into my mind; it was as if a mental bolt of lightning flashed across my consciousness, eclipsing my thoughts on how best to apply Fourier Transforms to study the time-resolved anisotropy of a fluorescent probe that I had developed for studying lipid viscosity in biological membranes and their models. The idea that shot through my mind was simple: explore the relation between Christian theology and the natural sciences, using philosophy and history as dialogue partners. It would be grounded in and faithful to the Christian tradition, yet open to the insights of the sciences. This would be more than a mere exploration of a working relationship; it would be a proposal for a synergy, a working together, a mutal cross-fertilization of ideas and approaches – in short, a scientific theology.

Like all simple ideas, this turned out to be rather more difficult to put into practice than to conceive. The idea which came to me in a flash took twenty years to follow through. As the project which now follows is somewhat lengthy, it may be helpful to explain how it came to develop, and the form which it has taken.

By the age of eighteen, as someone about to leave high school and go up to university, I felt that I had sorted out the meaning of life, and so was free to move on to deal with other issues. One of the incorrigible certainties on which my life was based at this stage was that religion was outdated and irrelevant, if not actually harmful. My early views on this matter were shaped to no small extent by the writings of Karl Marx. I must confess, however, that I was probably influenced in my reading of Marx by his interpreters of the 1960s, who reworked Marx's vision of the working class as the vanguard of a socialist society. The working classes having signally failed to achieve what Marx had expected of them, Theodore Adorno and others suggested that students should be seen as inheriting their mantle. This appealed to teenagers such as myself in the late 1960s; it offered us a real role in the reshaping of history, as well as an excellent excuse for not being bothered by such wearisome matters as academic work. Who could fail to be seduced by being offered such an historic role? Whose ego could fail to be pampered by such a grandiose vision? It was also useful at a more mundane level. It allowed school students such as myself to suggest that we were far too busy creating a new world order to have time for such irrelevancies as homework.

The student riots in Paris and the United States suggested that real and permanent social change was not far away. In Northern Ireland, in which I had spent my entire youth, the events which gave birth to what were euphemistically termed 'the troubles' in 1968 were viewed by many more idealistic dreamers – myself included – as representing the dawn of a new era. It would be an era without religion. Marx had offered an explanation of the origins of religion which predicted its elimination through socio-economic change. Northern Ireland was notorious for its religious tensions; the elimination of religion would therefore lead to a new era of peace, co-operation and progress. It was impossible to overlook the compelling appeal of this world-view, and avoid being shaped by its vision. It was clear to me that Christianity was a relic of a past era, for which the future had no place. I was encouraged in this belief by a work which I had read in its second edition while a high school student – A. J. Ayer's powerful *Language, Truth and Logic*, which offered a vigorous rejection of metaphysics and elimination of any need to speak of God. Ayer's argument for atheism as the only intellectually credible and politically focused world-view for a thinking person seemed irrefutable.

Although I was interested in philosophy and politics while at school, my studies focused on the natural sciences. I had chosen to specialize in

the sciences from the earliest moment possible within the British educational system, and at the age of eighteen was awarded a scholarship to study chemistry at Oxford University. The decision to study at Oxford is easily explained. It was widely regarded as offering the best university-level course in chemistry in Great Britain. In addition, it offered the possibility of a hugely stimulating intellectual environment in which to consolidate my atheistic views. A. J. Ayer, whom I so greatly revered, was professor of philosophy at this point; I would have the opportunity of attending his lectures. I had decided to study at Wadham College partly on account of the excellence of its chemists (J. R. Knowles and R. J. P. Williams were fellows of the college at this time), and partly on account of the college's association with left-wing politics at this time.

Looking back on those days, I find myself amazed at my arrogance and naïveté. How could I have hoped to have sorted out the great issues of life by the age of eighteen? On arriving at Oxford, I found my settled intellectual certainties were challenged. Doubts which I had suppressed concerning the intellectual credibility of atheism began to crystallize. Marxism seemed to offer answers which were simply too neat to relate to the complex and fuzzy realities of life. Although the intellectual discrediting of Marxism in British academia probably dates from around 1989, signs of decay and failure were everywhere evident at this earlier stage, for those who chose to notice them. It was intellectually fashionable to be a Marxist at this time in Oxford, which presumably explains why so many who claimed to have espoused it seemed to know little about it, or have any real commitment to its values. A disconcerting number of Wadham College's more prominent Marxists seemed to end up becoming merchant bankers, offering what seemed to me to be a rather lame justification for this remarkable about-turn – the aspiration of 'reforming the system from within'.

A. J. Ayer also turned out to be something of a disappointment. The radical philosophy which I had found so appealing as a teenager had, in effect, become the establishment position at Oxford. Although the Oxford guild of professional philosophers would not have seen it like this, the simple fact was that Oxford philosophy had become stuck in a rather boring rut. More interesting, creative and important things were happening elsewhere. As if that were not enough, I discovered that Ayer's reputation at Oxford in the early 1970s seemed to have rather more to do with his sexual proclivity than his philosophical creativity. The 'I've-slept-with-Freddy-Ayer' club was rumoured to be one of Oxford's less exclusive societies. New College students whom I knew

took great pleasure in relating how Ayer had fallen into the habit of placing his shoes on the window sills of his rooms in New College when expanding the frontiers of human knowledge.[1]

By the end of my first term at Oxford, I was in a state of mental flux. I had suffered the immense inconvenience of discovering that Christianity could not be dismissed as easily as I had thought. In fact, it seemed to have rather a lot going for it. I underwent the kind of experience that Augustine describes so powerfully in his *Confessions*, which could be thought of as a 'twice-born' encounter with the Christian faith. While I continue to have difficulty in identifying the factors which brought about this decisive change in my outlook, I am quite clear that by the end of my first term at Oxford, I had firmly accepted the basic ideas of the Christian faith as both intellectually persuasive and personally fulfilling.

A huge amount of rethinking remained to be done, not least in relation to my interests in the natural sciences. Having previously thought, in rather uncritical terms which I now realize to have been shaped by Andrew Dickson White's hostile and inaccurate account of the relation of Christianity and the sciences,[2] that the natural sciences were the enemy of religion, I now began to realize that the situation was rather more complex (and interesting), demanding a more nuanced and informed response. My natural instinct was to abandon my studies of the natural sciences, and begin the detailed study of Christian theology. However, I was dissuaded from this, and in the end completed my first degree in chemistry and went on to gain a doctorate from Oxford in molecular biophysics. It was during a period spent working at the University of Utrecht on a European Molecular Biology Organization fellowship in 1976 that I began to think about the serious intellectual engagement between Christianity and the natural sciences, noted earlier, which would ensure that the theological, philosophical, historical and scientific aspects of the matter would be given full weight.

This demanded a serious engagement with Christian theology. On my return from Utrecht in August 1976, I began to plan how this might be realized. I had just been awarded a Senior Scholarship at Merton College, Oxford, for the period 1976–8. The scholarship in question allowed its holder either to undertake research work for an advanced degree of the University of Oxford, or to study for a second first degree,

[1] Some of these are documented in Ben Rogers, *A. J. Ayer: A Life*. London: Chatto & Windus, 1999. Some of the more interesting anedoctes circulating at the time appear to have been omitted, presumably for legal reasons.

[2] Andrew Dickson White, *The Warfare of Science*. London: Henry S. King & Co., 1867.

without limit of subject. I therefore asked the college authorities if it might be possible to fulfil both these possibilities, by continuing my research in molecular biophysics, while at the same time studying for the Final Honour School of Theology. In November 1976, the college agreed to this request.

At this stage, I was very much an amateur in matters of theology. I suspect that my interest in theology might well have proved to be short-lived, if not stillborn, had I begun my theological studies by reading some of the works which were typical of English-language theology of this time. However, redemption was at hand. Although I had left Wadham College in 1975 to take up a research scholarship at Linacre College, I remained in touch with its recently-appointed chaplain Tim Gorringe (now Professor of Theology at Exeter University). Gorringe was working on aspects of the theology of Karl Barth,[3] and suggested that I could do far worse than immerse myself in the *Church Dogmatics*. By the end of the first half-volume – which had just appeared in a new English translation, replacing the unsatisfactory translation originally published in 1936 – I knew that I was going to be excited by the study of theology. Barth's vision of theology might well have been controversial, and caused eyebrows to be raised within the English theological establishment of the time. But the vision was exciting, challenging and inspirational. Above all, I found myself impressed by the intellectual coherence of Barth's vision of 'theological science', and thrilled by the vision Barth offered of a sustained theological engagement with the past:[4]

> 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.

With this in mind, I set out to ensure that I immersed myself in historical theology, as well as systematic theology, realizing that the latter could not be undertaken without the former, and that the former was incomplete without the latter. While I have misgivings about many aspects of Barth's theology – as I think these volumes will make clear – it is impossible to understate the positive impact which Barth had upon

[3] For a recent example of his writing in this area, see Timothy R. Gorringe, *Karl Barth: Against Hegemony*. Oxford: Oxford University Press, 1999.

[4] Karl Barth, *Die protestantische Theologie im 19. Jahrhundert: Ihre Vorgeschichte und ihre Geschichte*. 2nd edn. Zurich: Evangelischer Verlag, 1952, 3.

my estimate of, and enthusiasm for, theology as a serious intellectual discipline.

I went on to complete my doctorate in December 1977, and take first-class honours in theology in June 1978. My hope had been that I would be able to plunge into the debate about the relation of Christian theology and the natural sciences on the basis of a doctorate and publications in the latter,[5] and a first degree in the former. I had been elected to the Naden Studentship in Divinity at St John's College, Cambridge, and intended to use my time at Cambridge to study the Copernican debates of the second half of the sixteenth century. This, I hoped, would be good enough to allow me to get on with the project I had devised two years earlier. However, it soon became obvious that a mere first degree in theology was totally inadequate – although certainly better than nothing – as the basis for such an engagement. The problem was not simply mastering the ideas, but coming to terms with an extensive body of literature already written on the topics of direct relevance to my project, while at the same time keeping up with my reading in the history and philosophy of science. The task seemed totally unmanageable.

Happily, there proved to be a way of dealing with the immensity of the task by breaking it down into more manageable segments. Under the guidance of the late Gordon Rupp (then the *doyen* of English Luther studies, who had at that stage recently retired as Dixie Professor of Ecclesiastical History at Cambridge University), I began to develop an engagement with one major period in Christian theology (the Reformation), one major Christian theologian (Martin Luther), and the development throughout history of one specific Christian doctrine (the doctrine of justification).[6] Having dealt with these three related topics, it was relatively simple to use each as a platform for engaging with other periods, other theologians, and other doctrines. The approach

[5] For which see Benjamin de Kreef et al., 'Lipid Asymmetry, Clustering and Molecular Motion in Biological Membranes and Their Models', in S. Abrahamsson and I. Pascher (eds), *Nobel Foundation Symposium: Biological Membranes and Their Models.* New York: Plenum Press, 1977, 389–407; Alister E. McGrath, Christopher G. Morgan and George K. Radda, 'Photobleaching: A Novel Fluorescence Method for Diffusion Studies in Lipid Systems', *Biochimica at Biophysica Acta* 426 (1976), 173–85; Alister E. McGrath, Christopher G. Morgan and George K. Radda, 'Positron Lifetimes in Phospholipid Dispersions', *Biochimica at Biophysica Acta* 466 (1976), 367–72.

[6] See Alister E. McGrath, *Luther's Theology of the Cross: Martin Luther's Theological Breakthrough.* Oxford: Blackwell, 1985; idem, *The Intellectual Origins of the European Reformation.* Oxford: Blackwell, 1987; idem, *Iustitia Dei: A History of the Christian Doctrine of Justification.* 2nd edn. Cambridge: Cambridge University Press, 1998.

Rupp advocated also allowed me to grapple with the issue of the development of Christian doctrine in general.[7] By 1996 – some twenty years after the idea for the project was conceived – I finally felt ready to begin serious work in the field.

I began to set out some of my reflections on this relationship in an earlier work *The Foundations of Dialogue in Science and Religion* (1998), which may be regarded as an anticipation of the present, more substantial series of works.[8] This work represented an expanded version of a lecture I was invited to deliver at the University of Utrecht in January 1997 on 'The Relation of the Natural Sciences and Christian Theology', and can be seen as doing little more than clearing my own mind, preparatory to a more detailed engagement with the issues.

It was always clear to me that several volumes would be needed to do justice to the notion of a 'scientific theology', which sought to draw upon and interact with the methods of the natural sciences as an aid to theological reflection and analysis. Where medieval writers had extolled the virtues of philosophy as *ancilla theologiae*, I had come to the different – though clearly related – conclusion that it was a *natural* philosophy which would best serve this purpose.[9] To do justice to the theological, scientific, philosophical and historical issues involved, it was obvious from the outset that the traditional monograph was a quite inappropriate means of addressing this issue. Like many others, I had been frustrated by the brevity of many such existing discussions, and longed for the detailed and sustained engagement which a project of this magnitude demanded.

Such a work counters the trend towards the fragmentation of intellectual discourse and engagement by calling for the forging of links

[7] Alister E. McGrath, *The Genesis of Doctrine*. Oxford: Blackwell, 1990.

[8] Alister E. McGrath, *The Foundations of Dialogue in Science and Religion*. Oxford: Blackwell, 1998.

[9] On the important concept of 'natural philosophy', see Luciano Boi (ed.), *Science et philosophie de la nature: un nouveau dialogue*. Berne: Peter Lang, 2000. For older approaches, J. A. Bennett, 'Robert Hooke as Mechanic and Natural Philosopher', *Notes and Records of the Royal Society* 35 (1980), 33–48; L. W. B. Brockliss, 'Aristotle, Descartes and the New Science: Natural Philosophy at the University of Paris, 1600–1740', *Annals of Science* 38 (1981), 33–69; James W. Garrison, 'Newton and the Relation of Mathematics to Natural Philosophy', *Journal of the History of Ideas* 48 (1987), 609–27; P. M. Heimann, 'Nature is a Perpetual Worker: Newton's Aether and Eighteenth-Century Natural Philosophy', *Ambix* 20 (1973), 2–24; J. F. W. Herschel, *Preliminary Discourse on the Study of Natural Philosophy*. London: Longman, Rees, Orme, Brown & Green, 1830; James R. Jacob, 'The Ideological Origins of Robert Boyle's Natural Philosophy', *Journal of European Studies* 2 (1972), 1–21; J. R. Lucas, *Space, Time and Causality: An Essay in Natural Philosophy*. Oxford: Oxford University Press, 1984.

between four distinct, though related, disciplines. It can be thought of as a dialogue between theology and the natural sciences, with history and philosophy as respected and necessary partners to, and participants in, that discussion. A serious synthesis of this nature demands a considerable degree of space, especially if it is to avoid the superficiality and simplification which inevitably accompany briefer discussions of so complex an issue.

I must therefore apologize in advance for the length of the volumes which go to make up this analysis of 'scientific theology'. Their length results from the need to achieve a viable synthesis which recognizes and responds to the many issues which are involved. It is my hope that my readers will forgive the length of the work, and perhaps that they may capture something of my sense of intellectual excitement concerning the project.

The present work is fundamentally an attempt to explore the interface between Christian theology and the natural sciences, on the assumption that this engagement is necessary, proper, legitimate and productive. Its three volumes set out to explore the manner in which the working assumptions of the natural sciences can serve as a dialogue partner to the theological enterprise, in which there is a genuine interaction and interchange between the two disciplines, to the mutual benefit of both. It is fundamentally a sustained essay in theological method, in the sense of an attempt to explore the contours of a potentially interesting dialogue, not without its difficulties, which promises to be one of the more significant intellectual conversations of the twenty-first century. The interface between Christian theology and the natural sciences is not merely an intellectually habitable zone; this exploration is to be seen as an essential consequence of core Christian beliefs, which have defined Christianity throughout its long and complex history.

Interdisciplinary inquiry – whether this takes the form of the fusion of disciplines or the critical scrutiny of their boundaries – has become an increasingly important element of general intellectual activity. Yet it is reasonable to point out that some such inquiry is undertaken in something of a spirit of serendipity – a hope that the study of two apparently unrelated disciplines might yield new and exciting insights, inaccessible from the perspective of either on its own. Others, in contrast, are based on the perception that the two disciplines are fundamentally related to one another, so that the analysis of their mutual relationship may be expected from the outset to be realistic and profitable. It is the contention of this work that the relationship of Christian theology to the natural sciences is that of two fundamentally

related disciplines, whose working methods reflect this common grounding in responding to a reality which lies beyond them, of which they are bound to give an ordered account.

This is not, as will become clear, a work of systematic theology. It is, however, a systematic work of theology – if this distinction may be allowed – which is primarily concerned with issues of method rather than substance. However, in that it is impossible to disentangle the manner in which knowledge arises from the specific knowledge thus attained, it will be clear that this difference has perhaps more to do with emphasis than substance. Theological assumptions cannot be isolated from theological method any more than the conclusions of the natural sciences may be disentangled from the methods used to infer them.

This work is written from an evangelical perspective, by which I mean an approach to theology which insists that 'theology must be nourished and governed at all points by Holy Scripture, and that it seeks to offer a faithful and coherent account of what it finds there'.[10] This task of rendering Scripture faithfully is, in my view, best carried out in dialogue with the 'great tradition' of Christian theology and in response to the challenges to the Christian faith which are raised by other disciplines – such as the natural sciences. Yet I have no doubt that many Christian theologians who would not wish to identify or style themselves as 'evangelical' will find much in these volumes that they will be able to welcome and appropriate. At its heart, after all, evangelicalism is fundamentally Christian orthodoxy, even though it may choose to place its emphases at points at which others might demur.[11]

The reader will notice that the work is generous in the amount of bibliographical information provided in footnotes. In view of the complexity and importance of many of the issues discussed in this work, I have felt it right to indicate the works which have led me to the conclusions set out in its pages. It is hoped that these references may

[10] Alister E. McGrath, 'Engaging the Great Tradition: Evangelical Theology and the Role of Tradition', in John G. Stackhouse (ed.), *Evangelical Futures: A Conversation on Theological Method.* Grand Rapids, MI: Baker, 2000, 139–58.

[11] On the complex issue of defining evangelicalism, see David Bebbington, *Evangelicalism in Modern Britain: A History from the 1730s to the 1980s.* London: Hyman, 1989; Stanley J. Grenz, *Revisioning Evangelical Theology: A Fresh Agenda for the 21st Century.* Downers Grove, IL: InterVarsity Press, 1992; Kenneth Hylson-Smith, *Evangelicals in the Church of England 1734–1984.* Edinburgh: T&T Clark, 1988; Alister E. McGrath, 'An Evangelical Evaluation of Postliberalism', in T. R. Philips and D. L. Okholm (eds), *The Nature of Confession: Evangelicals and Postliberals in Conversation.* Downers Grove, IL: InterVarsity Press, 1996, 23–44; John G. Stackhouse, *Canadian Evangelicalism in the Twentieth Century: An Introduction to Its Character.* Toronto: University of Toronto Press, 1993.

also be of some use to readers in developing their own thinking on these issues.

It will be obvious that I owe an enormous amount to those who have taught me, argued with me, and helped me see things more clearly. I can only begin to acknowledge these kindnesses. I owe thanks to Professors J. R. Knowles, G. K. Radda and R. J. P. Williams for instilling in me both a love and respect for the natural sciences, and a profound and healthy suspicion of ideas not grounded in an engagement with the real world. I owe an incalculable amount to those who helped me capture and sustain a sense of the excitement of theology, and wish to thank especially Professor Timothy Gorringe, Fergus Kerr OP, Professor Oliver M. T. O'Donovan, the late Professor E. G. Rupp, Professor Thomas F. Torrance, and Edward J. Yarnold SJ. Wycliffe Hall, Oxford, at which I have taught since 1983, has been an academically stimulating and spiritually supportive community, and has provided me with a secure base for research and writing. I am especially grateful to Mr Darren C. Marks (St Hugh's College, Oxford), who acted as my research assistant in the final stages of this work, and made invaluable suggestions for the improvement of the text. The John Templeton Foundation made funds available to support the research underlying these three volumes; without such generous assistance, this work could not have been written. What you, reader, make of them remains to be seen. It is my hope that you will find them interesting; I can at least be sure that it will take you less time to read this series than it has taken me to research and write it.

ALISTER E. MCGRATH
Oxford, October 2000

PART ONE

Prolegomena

Chapter 1

The Legitimacy of a Scientific Theology

The present work is conceived as an extended essay which explores the contours of a possible approach to a scientific theology. It aims to examine, critically yet appreciatively, the way in which the working assumptions and methods of Christian theology and the natural sciences interact with and illuminate each other, and allow each other's distinctive characteristics to be appreciated, as an interesting means to the greater end of achieving at least a partial synthesis of their insights. There are often significant similarities in the issues faced by both Christian theology and the natural sciences as they go about their respective tasks. It is therefore of considerable interest to ascertain whether these disciplines might have anything to learn from each other. This series of volumes is not intended to offer some definitive statements concerning the relation of Christian theology and the natural sciences, but to offer some suggestions which will stimulate discussion, even if they do not command assent.

The structure of this trilogy should make it clear that this work is primarily concerned with theological method, rather than with specific theological topics. This structure takes the following form:

1. *Nature.* This opening volume clarifies the general position to be adopted, before moving on to a detailed engagement with the concept of 'nature', which is of such decisive importance in any discussion of the relation of the natural sciences and theology. 'Nature' is often treated as a fundamental resource for theology, on the basis of the assumption that it is an unmediated and uninterpreted concept. Yet there is a growing and settled view

that the concept of 'nature' actually represents a socially mediated construct. Nature is thus to be viewed as an interpreted notion, which is unusually vulnerable to the challenge of deconstruction. The implications of this for a 'theology of nature' are explored, with especial reference to the Christian understanding of nature as creation.

2. *Reality.* The second volume in the series deals with the issue of realism in science and theology, and sets out both a critique of anti- and non-realism, and a positive statement of a realist position. In the light of this, the nature of a scientific theology is explored, with particular emphasis being placed upon theology as an *a posteriori* discipline which offers an account of reality.
3. *Theory.* The third and final volume in the series deals with the manner in which reality is represented, paying especial attention to the parallels between theological doctrines and scientific theories. This volume considers the origin, development and reception of such doctrines and theories, and notes the important parallels between the scientific and theological communities in these important matters.

By its very nature, this series of works is lengthy and complex. So why undertake such a major publishing programme? The answer lies in the degree of interconnectedness of the matters to be considered, which is such that it would be quite inappropriate to consider them in isolation. What is under consideration is not a series of isolated ideas, but a complex web of interacting concepts and methods, which demand to be considered as a system. The issues to be considered are not purely scientific or theological, but involve careful analysis of certain historical developments and episodes, the role of communities in testing and receiving ideas, and philosophical debates.

The need for this extended study is evident from a number of general and more specific considerations. In general terms, the growing interest in the relation of the natural sciences has thrown up a number of fundamental issues which have yet to be addressed with the detail and precision which they demand. We shall note two, simply to illustrate the issues. Much is made of 'natural theology' and 'the investigation of nature' in such discussions.[1] Yet what is 'nature'? How does this

[1] See, for example, Ian G. Barbour, 'Experiencing and Interpreting Nature in Science and Religion', *Zygon* 29 (1994), 457–87; Albert Borgmann, 'The Nature of Reality and the Reality of Nature', in Michael E. Soulé and Gary Lease (eds), *Reinventing Nature: Responses to Postmodern Deconstruction.* Washington, DC: Island Press, 1995, 31–46; Frederick Gregory,

notion relate to the more specifically theological concept of 'creation'? What are the intellectual rivals to the Christian understanding of nature, and how did they arise? Is it not a matter for some concern that the concept of nature has failed to receive the full theological attention that it demands? It is therefore imperative that this project should begin with a major engagement with the question of what is to be understood by the highly elusive – yet immensely important – concept of 'nature'.

A second example is provided by the rise of what is often referred to as the 'postliberal' school of theology, which stresses the importance of communities and narratives in theological reflection.[2] There is an obvious parallel here with the natural sciences, especially in the manner in which scientific communities originate theories and hypotheses, subject them to critical examination, and finally receive them within the community as a whole. Yet such parallels have been sadly overlooked, despite the considerable light which they cast upon the theological enterprise. The whole question of the genesis, development and reception of doctrine is of incalculable importance to theology, especially to those theologians who see their responsibilities in the light of being answerable to a community of faith. Yet the parallel process within the global scientific community, both in the past and at present, has not been given due attention. The present project will thus deal with this matter in some detail.

Yet the contribution of this project does not lie in the identification of a series of areas which have been neglected; it lies in its insistence that these be correlated, and brought together in a coherent vision of a 'scientific theology'. Charles Gore once spoke of the 'coherence' of Christian doctrine, meaning that each individual aspect of the Christian world-view was not freestanding, insulated from its neighbours. Rather, it was part of an interconnected and interactive whole. The manner in which the doctrines of the Trinity and the person of

---

Nature Lost? Natural Science and the German Theological Traditions of the Nineteenth Century. Cambridge, MA: Harvard University Press, 1992; C. Jungnickel and R. McCormmach, *Intellectual Mastery of Nature: Theoretical Physics from Ohm to Einstein.* 2 vols. Chicago: University of Chicago Press, 1986; James L. Larson, *Interpreting Nature: The Science of Living from Linnaeus to Kant.* Baltimore: Johns Hopkins University Press, 1994.

[2] George Lindbeck, *The Nature of Doctrine.* Philadelphia: Westminster, 1984. More generally, see Brad J. Kellenberg, 'Unstuck from Yale: Theological Method after Lindbeck', *Scottish Journal of Theology* 50 (1997), 191–218; Stephen L. Stell, 'Hermeneutics in Theology and the Theology of Hermeneutics: Beyond Lindbeck and Tracy', *Journal of the American Academy of Religion* 61 (1993), 679–703.

Christ relate to one another may be offered as one example of this phenomenon of interconnectedness. While it is unquestionably of interest to publish monographs dealing with individual aspects of the intellectual dialogue between Christian theology and the natural sciences, these must be seen as subsidiary to a process of integration and synthesis, leading to the formulation of a 'scientific theology' as a whole.

Were this project to have been published as a series of articles, a fatal fragmentation would have developed, at two levels. First, the articles would have been dispersed across a range of journals, dealing with such matters as the history and philosophy of science, the intellectual history of the sixteenth and eighteenth centuries, specialized aspects of patristic and medieval theology, classical philosophy, and the contemporary debate over the nature of 'postmodernity'. These discussions belong together, and require integration into a greater whole, in order to allow at least a partial glimpse of this greater perspective. Second, the ideas developed could not have been correlated with one another, and their importance for each other, and for the greater project as a whole, could not have been explored.

There have been several attempts to develop theological or ideological systems patterned on the natural sciences in the past. The most noted of these is Friedrich Engels' attempt to conceive Marxism as a science with a methodology similar to those of the natural sciences. This may have seemed attractive at the time; it was to prove a serious embarrassment to later Marxist writers. Georg Lukács, for example, rejected this approach, and urged a greater ontological modesty in Marxist claims.[3] Marxism was not to be seen as a universal theory of scientific method, applicable to nature in its totality, but a social theory, focused on a set of specific economic and social issues. The natural sciences were an inappropriate analogy for Marxist theory.

The present project argues, largely on the basis of a detailed analysis of a Christian doctrine of creation, that there are good reasons, grounded in the structure of the world as the creation of God, for developing an approach to theology which recognizes and welcomes convergences. There is, it will be argued, both an ontological foundation and imperative for dialogue between the disciplines, with important implications for the formulation and development of a scientific theology.

[3] Georg Lukács, *History and Class Consciousness*. Cambridge, MA: MIT Press, 1971, 24. For a discussion, see Steven Vogel, *Against Nature: The Concept of Nature in Critical Theory*. Albany, NY: State University of New York Press, 1996, 5–7, 15–20.

Science as the *ancilla theologiae*

Throughout its long history, Christian theology has found itself exploring its interface with other disciplines. The driving force behind this is not difficult to discern. The implicit claim on the part of the Christian faith to have a bearing on every aspect of human life, evident in both classics of Christian theology such as Augustine's *City of God*[4] and more recent works such as Abraham Kuyper's 1898 Stone Lectures at Princeton,[5] encouraged the direct engagement of Christian theology and other intellectual disciplines, on the understanding that the Christian doctrines of creation and redemption demanded precisely such an engagement as an integral element of discipleship. This process of interdisciplinary engagement has embraced philosophy, the arts, the social sciences, as well as the broad area of human intellectual endeavour usually described as 'the natural sciences'. Some, such as the thirteenth-century writer Roger Bacon, brought all together in a coherent vision of a comprehensive human engagement with reality, undergirded by a vigorous theological foundation.[6] For Bacon, *scientia* as a whole was the handmaiden of theology.

The natural sciences today offer to Christian theology today precisely the role that Platonism offered our patristic, and Aristotelianism our medieval forebears. A scientific theology will treat the working assumptions and methods of the natural sciences as offering a supportive and illuminative role for the Christian theological enterprise, both assisting theological reflection and identifying and allowing exploitation of apologetic possibilities and strategies.

The notion of the ancilla theologiae

Before beginning to examine the manner in which the natural sciences can now become the *ancilla theologiae nova*, we must consider the issues which arise in allowing any world-view to play such a role. To permit the natural sciences to act in this matter is to allot them a certain privilege, and it must be understood from the outset that its role is

[4] See Robert A. Marcus, *Saeculum: History and Society in St Augustine*. Cambridge: Cambridge University Press, 1970.

[5] Abraham Kuyper, *Lectures on Calvinism*. Grand Rapids, MI: Eerdmans, 1948. See further Peter Somers Heslam, *Creating a Christian Worldview: Abraham Kuyper's Lectures on Calvinism*. Grand Rapids, MI: Eerdmans, 1998.

[6] David C. Lindberg, 'Science as Handmaiden: Roger Bacon and the Patristic Tradition', *Isis* 78 (1987), 518–36.

limited, circumscribed and above all *supportive*. The natural sciences neither prove nor disprove Christianity; they are, however, a most profitable dialogue partner.

An early example of this process of intellectual engagement is provided through the expansion of Christianity into a Hellenistic milieu in the first centuries of its history, which led to the exploration of the contours of the relationship between Christianity and secular Greek philosophy.[7] Greek metaphysics had developed the idea of a god long before its encounter with Christianity, with the result that the proclamation of the God of Jesus Christ in this milieu involved somewhat tortuous negotiations with this metaphysical god, leading to a complex and nuanced history of identifications and differentiations.[8] Among these may be noted the distinct tendency to identify the figure of Christ with the mediating principle of Middle Platonism. It is perhaps unfair to suggest that this represents the dominance of rationalism or philosophy over the data of Christian revelation. There is a temptation for every generation of theologians to bring a cluster of inherited metaphysical commitments as self-evident, requiring no further justification, to the task of theology. The engagement of the Christian tradition with an already existing view of reality thus required that certain elements of the philosophical concept of God be critically refined, remastered and reappropriated.

The interaction between Christian theology and classical philosophy underwent further exploration during the Middle Ages, as Aristotelianism became increasingly the *ancilla theologiae* of preference. The works of Aristotle had been preserved in the Islamic world, and had become a resource of some considerable importance for the development of a number of Arabic sciences.[9] With the translation of these works into Latin, a major new intellectual resource was placed at the disposal of medieval theology. As a study of those western Christian theologians to have availed themselves of this new resource – such as Thomas Aquinas – makes clear, the interaction between Christianity

[7] Aloys Grillmeier, 'Hellenisierung-Judaisierung des Christentums als Deuteprinzipien der Geschichte des kirchlichen Dogmas', *Scholastik* 33 (1958), 321–55, 528–55. More generally, see the important overview of Henry Chadwick, *Early Christian Thought and the Classical Tradition*. Oxford: Clarendon Press, 1966.

[8] Wolfhart Pannenberg, 'The Appropriation of the Philosophical Concept of God as a Dogmatic Problem of Early Christian Theology', in *Basic Questions in Theology II*. London: SCM Press, 1971, 119–83.

[9] Shukri B. Abed, *Aristotelian Logic and the Arabic Language in Al-Farabi*. Albany, NY: State University of New York Press, 1991; Francis E. Peters, *Aristotle and the Arabs: The Aristotelian Tradition in Islam*. New York: New York University Press, 1968.

and Aristotelianism was by no means straightforward.[10] For example, Aquinas' use of Aristotelian physics – as in his argument *ex motu* – caused some difficulties for traditional themes of Christian belief.[11] It was clear that an uncritical appropriation of Aristotelian insights was not a realistic possibility for theology. This perception was strengthened by certain shifts in the reception of Aristotelianism in the later Renaissance, not without significance for Christian theology,[12] and by the growing hostility towards the use of Aristotle in the more Augustinian writers of the later Middle Ages.[13] In that Aristotle's corpus of writings embraced both physics and metaphysics, meteoreology and logic, it was inevitable that the interaction between Christian theology and Aristotelianism would go far beyond the confines of philosophy, and embrace the natural sciences.

In the late sixteenth and early seventeenth century, Protestant Orthodoxy – both Lutheran and Reformed – found Aristotelianism a congenial dialogue partner, especially in relation to issues of theological method.[14] The rival system of Pierre Ramus found favour with other Protestant theologians, especially within English Puritanism.[15] Nineteenth-century American evangelicalism, noted for its commitment to the supreme authority of Scripture, did not have any difficulty in using some of the leading ideas of the Scottish Enlightenment in defending and developing their proposals.[16] Rudolf Bultmann and Paul Tillich found the form of existentialism developed in the writings of

[10] William E. Carroll, 'San Tommaso, Aristotele e la creazione', *Annales Theologici* 8 (1994), 363–76; James A. Weisheipl, 'Aristotle's Concept of Nature: Avicenna and Aquinas', in Lawrence D. Roberts (ed.), *Approaches to Nature in the Middle Ages.* Binghamton, NY: Center for Medieval and Early Renaissance Studies, 1982, 137–60.

[11] Alister E. McGrath, 'The Influence of Aristotelian Physics upon St Thomas Aquinas' Discussion of the *Processus Iustificationis*', *Recherches de théologie ancienne et médiévale* 51 (1984), 223–9.

[12] Charles B. Schmitt, 'Towards a Reassessment of Renaissance Aristotelianism', *History of Science* 11 (1973), 159–93.

[13] Adolar Zumkeller, 'Die Augustinertheologen Simon Fidati von Cascia und Hugolin von Orvieto und Martin Luthers Kritik an Aristoteles', *Archiv für Reformationsgeschichte* 54 (1963), 13–37; Alister E. McGrath, *Luther's Theology of the Cross: Martin Luther's Theological Breakthrough.* Oxford: Blackwell, 1985, 136–41.

[14] Richard Schröder, *Johann Gerhards lutherische Christologie und die aristotelische Metaphysik.* Tübingen: Mohr, 1983.

[15] Brian G. Armstrong, *Calvinism and the Amyraut Heresy: Protestant Scholasticism and Humanism in Seventeenth-Century France.* Madison, WI: University of Wisconsin Press, 1969; Donald K. McKim, *Ramism in William Perkins' Theology.* New York: Peter Lang, 1987.

[16] Sidney E. Ahlstrom, 'The Scottish Philosophy and American Theology', *Church History* 24 (1955), 257–72; Mark Noll, *Princeton and the Republic, 1768–1822.* Princeton, NJ: Princeton University Press, 1989, 28–58.

Martin Heidegger to be theologically fruitful,[17] where Emil Brunner (much to the irritation of Karl Barth) exploited the dialogical personalism of Martin Buber.[18] This list could be extended without difficulty. The point at issue is that, throughout its long history, Christian theology has willingly drawn upon philosophical resources to assist it in its task of exploration, criticism and synthesis.

The issues which are raised by the theological adoption of such philosophies are quite well understood, and may be summarized briefly as follows.

- The *potential* of the approach is that it allows for rigorous exploration of ideas, allowing parallels with other spheres of human intellectual activity to be appreciated and appropriated. It also serves an important apologetic purpose, in that it allows the Christian proclamation to be related to a wider intellectual culture, by identifying linguistic and conceptual parallels through which the gospel may be preached more effectively. Providing that the *ancilla* is understood to function in a ministerial, rather than magisterial, capacity, the integrity of theology as a discipline can be maintained without undue difficulty.
- The *danger* of the approach is that ideas whose origins, nature and justification lie outside the Christian faith may come to have a significant or decisive influence over how the Christian faith is presented or conceived. The history of the Christian tradition offers us numerous examples of secular philosophy being allowed to play a magisterial, rather than ministerial, role, whatever the original intention in adopting it may have been. Adolf von Harnack argued that the influence of Greek metaphysics upon Christianity was such that an essentially Hebraic gospel was distorted through the gradual assimilation of the gospel to Hellenistic ways of thinking.[19] Martin Luther complained that much late medieval Christian theology rested on Aristotle, rather than the Bible.[20] For Karl Barth, leaning on any secular philosophy

[17] John Macquarrie, *An Existentialist Theology: A Comparison of Heidegger and Bultmann.* London: SCM Press, 1965.

[18] Bernhard Langemeyer, *Der dialogische Personalismus in der evangelischen und katholischen Theologie der Gegenwart.* Paderborn: Verlag Bonifacius-Druckerei, 1963; Roman Rössler, *Person und Glaube: Der Personalismus der Gottesbeziehung bei Emil Brunner.* Munich: Kaiser Verlag, 1965.

[19] E. J. Meijering, *Die Hellenisierung des Christentums im Urteil Adolf von Harnack.* Amsterdam: Kampen, 1985.

[20] McGrath, *Luther's Theology of the Cross: Martin Luther's Theological Breakthrough,* 136–41.

> or methodology – to however moderate an extent – risked introducing anthropology into theology, and compromising theology's distinctive character as a response to divine revelation.[21]

On the basis of this brief analysis, it will be clear that there exists a well-established tradition within Christian theology of fostering interaction with intellectual resources which ultimately have their origins and derive their legitimation from outside the Christian perspective. The critical use of the methods and assumptions of the natural sciences may thus be argued to conform to an acceptable pattern, providing that they are understood to function in a ministerial capacity as a theological resource. In what follows, we shall consider some aspects of the debate over the use of such resources in greater detail.

The patristic debate over philosophy as the ancilla theologiae

An intensive debate took place during the patristic period over this issue, and may be regarded as being of landmark importance. One of the most important debates in the early church concerned the extent to which Christians could appropriate the immense cultural legacy of the classical world – poetry, philosophy, and literature. In what ways could Platonism be used to communicate the Christian faith? The debate went beyond the question of the *ideas* to be used in this matter to include the *literary form* in which such ideas were deployed. In what way could the *ars poetica* be adopted by Christian writers, anxious to use such classical modes of writing to expound and communicate their faith? Or was the very use of such a literary medium tantamount to compromising the essentials of the Christian faith? It was a debate of immense significance, as it raised the question of whether Christianity would turn its back on the classical heritage, or appropriate it, even if in a modified form.

One early answer to this important question was given by Justin Martyr, a second-century writer with a particular concern to exploit the parallels between Christianity and Platonism as a means of communicating the gospel. For Justin, the seeds of divine wisdom had been sown throughout the world, which meant that Christians could and should expect to find aspects of the gospel reflected outside the church.[22]

[21] Arie L. Molendijk, 'Ein heidnische Wissenschaftsbegriff. Der Streit zwischen Heinrich Scholtz und Karl Barth um die Wissenschaftlichkeit der Theologie', *Evangelische Theologie* 52 (1992), 527–45.

[22] Justin Martyr, *Apologia* I.xlvi.2–3; II.x.2–3; II.xiii.4–6.

> We have been taught that Christ is the firstborn of God, and we have proclaimed that he is the Logos, in whom every race of people has shared. And those who live according to the Logos are Christians, even though they may have been counted as atheists – such as Socrates and Heraclitus, and others like them, among the Greeks ... Whatever either lawyers or philosophers have said well, was articulated by finding and reflecting upon some aspect of the Logos. However, since they did not know the Logos – which is Christ – in its entirety, they often contradicted themselves ... Whatever all people have said well belongs to us Christians. For we worship and love, next to God, the Logos, who comes from the unbegotten and ineffable God, since it was for our sake that he became a human being, in order that he might share in our sufferings and bring us healing. For all writers were able to see the truth darkly, on account of the implanted seed of the Logos which was grafted into them.

For Justin, Christians were therefore at liberty to draw upon classical culture, in the knowledge that whatever 'has been said well' ultimately draws upon divine wisdom and insight.

Important though Justin's argument may have been, it received a somewhat cool reception in many sections of the Christian church. The main difficulty was that it was seen virtually to equate Christianity with classical culture by failing to articulate adequate grounds for distinguishing them, apparently suggesting that Christian theology and Platonism were simply different ways of viewing the same divine realities. Justin's pupil Tatian (born *c.* 120) was sceptical concerning the merits of classic rhetoric and poetry, both of which he regarded as encouraging deception and a disregard for matters of truth. The most severe criticism of this kind of approach was to be found in the writings of Tertullian, a third-century Roman lawyer who converted to Christianity. What, he asked, has Athens to do with Jerusalem? What relevance has the Platonic academy for the church? The manner in which the question is posed makes Tertullian's answer clear: Christianity must maintain its distinctive identity by avoiding such secular influences.[23]

> Philosophy provides the material of worldly wisdom, in boldly asserting itself to be the interpreter of the divine nature and dispensation. The heresies themselves receive their weapons from philosophy. It was from this source that Valentinus, who was a disciple of Plato, got his ideas about the 'aeons' and the 'trinity of humanity'. And it was from there that the god of Marcion (much to be preferred, on account of his

[23] Tertullian, *de praescriptione haereticorum*, 7.

> tranquillity) came; Marcion came from the Stoics. To say that the soul is subject to death is to go the way of Epicurus. And the denial of the resurrection of the body is found throughout the writings of all the philosophers. To say that matter is equal with God is to follow the doctrine of Zeno; to speak of a god of fire is to draw on Heraclitus. It is the same subjects which preoccupy both the heretics and the philosophers. Where does evil come from, and why? Where does human nature come from, and how? . . . What has Athens to do with Jerusalem? What has the Academy to do with the church? Our system of beliefs comes from the Porch of Solomon, who himself taught that it was necessary to seek God in the simplicity of the heart. So much the worse for those who talk of a 'stoic', 'platonic' or 'dialectical' Christianity!

This wholesale rejection of every aspect of pagan culture had the advantage of being simple to understand. Christianity, according to Tertullian, was basically a counter-cultural movement, which refused to allow itself to be contaminated in any way by the mental or moral environment in which it took root.

Tertullian's basic question would find echoes throughout Christian history. For example, the English writer Alcuin rebuked the monks of Lindisfarne Abbey in 797 for reading too many Nordic sagas. 'What has Ingeld to do with Christ?', he asked, and by doing so, posed exactly the same question raised by Tertullian centuries earlier. Alcuin's remedy for the situation was direct and to the point: 'Let the words of God be read aloud at table in your refectory. It is the reader who should be heard there, not someone playing and fluting. It is the fathers of the church, and not the songs of the heathen, who should be heard.'

Yet there were difficulties with this consistently negative approach. It seemed to deny Christians access to or use of any of the intellectual and cultural heritage for a thoroughly laudable purpose – namely, the preaching of the gospel. Many early Christian writers studied classic rhetoric as a means of improving their preaching and writing, and thus facilitating the communication of the faith to those outside the church. Was Tertullian excluding this? Alongside this pragmatic approach could be found a more theological issue. Does not all true wisdom have its origins in God? And if so, should not Christians honour that truth where it is to be found? To his critics, Tertullian seemed to offer little in the way of response to these questions.

The matter became of greater significance with the conversion of the Roman emperor Constantine around the year 313. Christianity gradually came into favour, eventually to become the official religion of the Roman empire. The issue of the interaction of Christianity and

classical culture now assumed a new significance. Rome was now the servant of the gospel; might not the same be true of its culture? If the Roman state could be viewed positively by Christians, why not also its cultural heritage? It seemed as if a door had opened upon some very interesting possibilities. Prior to 313, this possibility could only have been dreamt of. After 313, its exploration became a matter of urgency for leading Christian thinkers.

It is no surprise that the answer which would finally gain acceptance was set out by Augustine of Hippo, and can perhaps be best described as the 'critical appropriation of classical culture'. For Augustine, the situation of Christians in late classical culture was comparable to Israel fleeing from captivity in Egypt at the time of the Exodus. Although they left the idols of Egypt behind them, they carried the gold and silver of Egypt with them, in order to make better and proper use of such riches, which were thus liberated in order to serve a higher purpose than before. In much the same way, the philosophy and culture of the ancient world could be appropriated by Christians, where this seemed right, and thus allowed to serve the cause of the Christian faith. Augustine clinched his argument by pointing out how several recent distinguished Christians had made use of classical wisdom in advancing the gospel.[14]

> If those who are called philosophers, particularly the Platonists, have said anything which is true and consistent with our faith, we must not reject it, but claim it for our own use, in the knowledge that they possess it unlawfully. The Egyptians possessed idols and heavy burdens, which the children of Israel hated and from which they fled; however, they also possessed vessels of gold and silver and clothes which our forebears, in leaving Egypt, took for themselves in secret, intending to use them in a better manner (Exodus 3:21–22; 12:35–36) . . . In the same way, pagan learning is not entirely made up of false teachings and superstitions. It contains also some excellent teachings, well suited to be used by truth, and excellent moral values. Indeed, some truths are even found among them which relate to the worship of the one God. Now these are, so to speak, their gold and their silver, which they did not invent themselves, but which they dug out of the mines of the providence of God, which are scattered throughout the world, yet which are improperly and unlawfully prostituted to the worship of demons. The Christian, therefore, can separate these truths from their unfortunate associations, take them away, and put them to their proper use for the proclamation of the gospel . . . What else have many good and faithful people from

[14] Augustine of Hippo, *de doctrina Christiana*, II.xl.60–1.