and on hell as a real possibility for each person which they ought to confront in themselves.

The huge merit of Healy's work is its exceptionally clear and systematic account of a very complex theology. To launch a fundamental critique of a theology as organic and inter-connected as Balthasar's would clearly be beyond its scope. However, there were some points at which some more comment or critique would be welcome. For example, while it is clearly not the case that Balthasar is a simplistically optimistic universalist, I wonder whether there is a greater tension or paradox in his eschatology than that which Healy appears to characterise as 'an eschatology of universal hope' (p. 208). As in the eschatology of Karl Rahner, there seems to be a genuine and tense paradox between faith in Christ's universal saving power and the personal possibility of hell, a paradox which causes one not so much to reaffirm that one should 'hope' for the salvation of all (which tends to construe 'hope' as meaning 'I wish for x, but it might not happen'); but rather to reassess the nature of Christian hope in a more fundamental way. Further reflection on this might help us understand how, for Balthasar, in the context of the life-giving exchange of the Eucharist, what is evil and ugly 'can and must be accepted positively' – a claim which could otherwise seem impossible or trite (p. 200-1).

A second and related problem is that Healy's account of the role of the Eucharist in Balthasar's theology sometimes seems to give that sacrament a historical and liturgical particularity which would make Balthasar's integration of it into eschatology almost untranslatable into another theological tradition (a pity, given than Balthasar's thought can and does stimulate much theological reflection outside Roman Catholicism). At other times, however, that particularly was lost, the Eucharist became a kind of cosmic principle and one was left wondering in fact how the motif of the Eucharist improved over that of the beatific vision, which itself is felt by Healy to be in danger of being too abstract.

Other points which would merit further very interesting research would be Balthasar's readings of the earlier church fathers. Healy gives very interesting comparisons of Aquinas and Palamas with Balthasar: one is only hoping that someone will soon write a detailed study of how Balthasar reads Gregory of Nyssa, Origen and Maximus the Confessor.

In sum, this is an excellent book, an important one not only for the reader of Balthasar, but for any theologian interested in questions of ontology and eschatology. Whilst this reviewer is not convinced that Balthasar provides the 'renewal of metaphysics' that Healy claims for him, nevertheless Healy's elucidation of concepts such as the *analogia entis*, the asymmetrical mutuality between God and creation and the notion of gift and loss in respect of God, does provide a stimulating resource in the ongoing debate.

MORWENNA LUDLOW

THEOLOGY AND MODERN PHYSICS by Peter E. Hodgson, Ashgate, Aldershot, 2005, pp. 296, £16.99 pbk.

What has science to do with theology? Some, in Barthian mood, might argue little: taking theology as the human attempt to comprehend God's self-revelation, and science as the human account of how the world works. On the other hand, the Christian claim that God is to be understood as the creator who has endowed nature with order and humans with creative rationality implies that God can be known both from revelation and from the 'book of nature', which claim undergirds a long Christian tradition of natural theology. While theology, then, is not subject

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to scientific proof or disproof, the dramatic advances in physics, especially in the last century, and the continuing attempt to draw out the implications of the theories of relativity and quantum physics, raise new questions about how we understand time, cosmology, and God's action in the world: if, for example, the universe is fundamentally indeterminate, just the product of blind chance (as some interpret quantum theory to imply), then it seems difficult to give a coherent account of divine agency. Hodgson's aim, stated in his preface, is 'to survey the interactions of theology and science [physics] through the centuries, with particular emphasis on the problems and pseudo-problems raised by the new physics of the twentieth century', because this has profoundly altered our conceptions of the cosmos and so also has profoundly affected our theological discourse.

Hodgson begins by discussing the relationship of theology, philosophy and science, drawing out the interconnections of these areas of inquiry. Philosophy initially arose (especially among the ancient Greeks) from an attempt to make sense of the world we experience. Hodgson argues that the ancient Greeks provided many of the beliefs about the material world that were essential for science (for example, that it is worthy of study, rational, orderly and open to the human mind). Yet science did not flourish in the classical world. This raises a question usually ignored in many popular histories of science, which jump from considerations of the cultural achievements of the ancient Greeks to the rediscovery of classical culture in the sixteenth-century Renaissance, which is usually conflated with the birth of modern science in the seventeenth century. This account ignores what Hodgson argues as one of his principal theses: that additional beliefs essential for modern science came from the Hebrew tradition and Christian theology; and it was only when the Hebrew and Christian belief in the orderly creation of the world by God was 'century by century hammered into the European mind to the exclusion of all other beliefs' (p. 5) from the High Middle Ages onwards that it provided the ground for the birth of modern science.

His main argument is that the cultural environment that allowed the genesis of modern science was that of Western Christian Europe (contrary to what more recent cultured despisers of that environment have noisily asserted to be the case). As he concludes (p. 224) 'this is not to say that modern science could never have developed in the absence of Christian revelation, but in actual historical fact it did not'. In support of this contention he documents the Judeo-Christian roots of science in the High Middle Ages. Next, he discusses the role of science in Muslim cultures, the Renaissance, classical (Newtonian) and modern (relativity and quantum theory) physics, cosmology, chaos theory, and concludes with some reflections on science and non-Christian religions.

Until Stephen Hawking came along it used to be perceived publishing wisdom that a book lost a percentage of its potential sales for every equation in the text. There are some equations in this book, but this shouldn't put people off, for Hodgson carefully draws out the implications of these formal statements. He makes the important point that 'Newtonian dynamics can only be expressed mathematically, and the mathematics is much easier to understand than the physics. . .reading verbal descriptions of Newtonian dynamics (and, *a fortiori*, relativity and quantum mechanics) can give only the illusion of understanding' although, as he tartly remarks, 'this is frequently deemed sufficient by popular writers to serve as a basis for their fantasies' (p. 67). He further rejects the Copenhagen interpretation, arguing that the indeterminacy of quantum mechanics is epistemic, not ontological, that 'physical reality is a strictly determined system that we only partly understand'. Quantum mechanics, therefore, gives no support to the philosophical propositions associated with it (nor to any additional theological speculations); and provides no new insight into free will or God's action in the world (p. 170).

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Hodgson's discussion is lucid, detailed and convincing. He argues that while the Aristotelian world view was logically coherent and had served as a conceptual framework for almost two thousand years, its emphasis on purpose and its privileging of intuition against quantitative measurement prevented the self-sustaining development of genuine science (p. 21). In contrast, the Judeo-Christian doctrine that God freely chose to create the universe (implying that he could have created it otherwise) encouraged the development of the experimental method (intuition is insufficient for understanding the world, we need to *study* it) essential for the development of science. He instances the long Christian tradition (dating from Augustine) that Scripture must be interpreted in a way that is not contradicted by established scientific conclusions; in contrast, the dominance of fundamentalist interpretations of the Qur'an is thought to be one of the major factors for the decline of science in the Muslim world from the fifteenth century. Even though this interpretation is held by few Muslim scientists today, its damaging cultural legacy persists.

Accordingly, if Christian beliefs form the essential presuppositions of modern science, then one might expect the progress of science to be impeded where these beliefs are either absent, repudiated, or ignored. Hodgson claims that this is in fact the case, taking as examples of the first category the religions of the East (Buddhism, Hinduism, and Taoism); of the second, the twentieth-century European totalitarian regimes (Nazi Germany and Soviet Russia); and of the third our own materialistic, hedonistic, capitalist society. Lest this be seen as cultural imperialism Hodgson notes that it 'it is a matter of historical fact that modern science developed in Western Europe and not in the East' (p. 208). Does Japan, where the standard of science is very high, provide a counter-example? Hodgson admits that this question is not easy to answer. He notes that the Japanese have an extraordinary ability to absorb ideas from other cultures, and cites an eminent Japanese physicist who commented that '"he often felt he was doing physics from the neck up" that is, that the beliefs on which his physics was based were not deep-rooted in his own culture, but came from outside.' (pp. 211-212). Similarly, I have heard Japanese biologists claim that it is easier for them to prosecute a successful scientific career in the USA and then return to Japan than it would be for them to do so at home. As Hodgson notes, these remarks are only speculative, and further research is desirable.

The early history of the atomic bomb is well known and illustrates both the failure of the Nazi regime to appreciate the importance of science, and the dramatic deterioration of German science which resulted from their policies (p. 214). Despite the high priority given to science in the Soviet Union, it simply could not keep up with the technology of the West, and was shackled by ideological inhibition of communication (p. 220). Similar autocratic social conditions might explain the lack of development of modern science in Eastern Christendom (pp. 36-38); the university was a product of the Medieval West. However, we should not be complacent. Hodgson thinks that contemporary Western culture, with its materialistic emphasis on immediate satisfaction, does not encourage (young) people 'to devote their lives to seeking the truth about the material world' (p. 221). This underlines the fact that science is primarily a vocation, a way of giving glory to God; and like other areas of human work is subverted when everything is subordinated to economics, so that profitability is the sole criterion of worth. We might, then, need the Christian counter-culture to become more actively engaged in promoting science: a new, and increasingly important role for faith schools, perhaps?

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