## CHAPTER SIX

# PARASITES AND PANGLOSS: ROBIN ATTFIELD ON EVOLUTIONARY THEODICY AND ENVIRONMENTAL ETHICS

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My encounters with Robin Attfield have been diverse, even though we had never met until the colloquium in his honour in Cardiff in 2009. I knew of course of his books on environmental ethics, and I was therefore delighted to be sent for review his more recent *Creation, Evolution and Meaning* (Attfield, 2006a). I described this without hesitation as "an important work of philosophical theology", and noted that I was "full of admiration for the clarity of thought that underlies every part of this book" (Southgate, 2008a). I was particularly helped by his treatment of evolution and suffering, which contributed significantly to my own recent monograph *The Groaning of Creation* (Southgate, 2008b).

So I was delighted to receive an affirmative email from Attfield about *Groaning*. It's par for the course in academe that no sooner is one's own book out that another book in the same area appears immediately. A philosophical treatment of the problem of animal suffering was duly published straight after my own book. This was Michael J. Murray's *Nature Red in Tooth and Claw*, which I was able to ask Attfield to review (Murray, 2008; Attfield, 2009a). I will return to Murray's book later in this chapter. But meanwhile I had the extraordinary privilege, at a conference in Crete in 2008, of standing in for Robin Attfield, reading out his paper and fielding questions on the latest version of his argument on stewardship.

So I have had plenty of opportunity recently both to appreciate Attfield's work and even to pretend to be him! What I want to do in this present piece is to comment on the relation between his position on evolutionary theodicy and my own, and then consider how that difference in theological approach might be correlated with a difference in ethical emphasis.

## **Attfield on Evolutionary Theodicy**

One of the great merits of Attfield's treatment of evolutionary suffering is his nuanced and critical approach to evolutionary theory, which is like any good theory full of internal arguments (Attfield, 2006a, 109-14). This bears very much on his final question: "Could things be otherwise?" (Attfield, 2006a, 147-50) and hence on the burden of suffering that the evolutionary theodicist is tasked with addressing. The jury is very much out on the adequacy of natural selection alone as an evolutionary mechanism. Yet the theologian should be very wary of the assumption that God had to input "information" to effect certain key transitions—the implication of Holmes Rolston's position in his Gifford Lectures, published as *Genes, Genesis and God* (Rolston, 1999). I think Attfield may be over-charitable to Rolston, and to Keith Ward, in supposing that they are positing purely naturalistic schemes as explanations for how evolution has given rise to the outcomes that it has (Attfield, 2006a, 149-50). Rolston writes.

for the key transitions in evolutionary history new information is needed in enormous amounts and... one cannot just let this information float in from nowhere... there is a Ground of Information... otherwise known as God. (Rolston, 1999, 359).

#### Ward writes in his God, Chance and Necessity,

Taking natural selection alone, it seems to me highly unlikely that rational beings should ever come to exist in a universe like this... I regard evolution by natural selection as a much more insecure and precarious process than seems compatible with the theistic idea of a goal-directed process... a continuing causal activity of God seems the best explanation of the progress towards greater consciousness and intentionality that one sees in the actual course of the evolution of life on earth. (Ward, 1996, 77-78)

In such passages these distinguished authors seem to run the risk of inserting God's influence into gaps in the causal order as described by science, gaps which further scientific understandings are in the habit of closing.

That is not to say that theistic reflections may not inform research programmes in evolutionary science—a good example is Simon Conway Morris's work on convergent evolution, and on the possible yet-to-be-characterised constraints that may exist on what evolutionary forms are ever "tried" (Conway Morris, 2003). But the existence of such constraints,

and the reasons underlying them, need to be properly established within the methodology of the relevant sciences, and not grafted in from theology, however rich the connections that might then be established between the resultant science and the theology of creation.

Of the trio of theological sources Attfield addresses at the end of his chapter on "God and evil" I think only Arthur Peacocke truly makes clear the importance of the evolutionary theologian engaging with a purely naturalistic account of the long narrative of evolution (see for example Peacocke, 1990). Any account of the evolutionary process that requires God to make up deficiencies in that process starts to fall into the same traps that beset intelligent design arguments. In particular, it seems inherently problematic to postulate that natural selection, operating on spontaneous variants, can accomplish almost all the evolution of characteristics of organisms, but that just occasionally the process cannot work and had to be either steered or set aside. And, of course, any account that involves any significant element of divine steering of the evolutionary process by efficient causation, as for example in the proposal of Robert J. Russell (Russell, 1998), greatly intensifies the problem of theodicy—it makes God not only the author of a process to which vast quantities of suffering and extinction are intrinsic, but it also posits that God is efficiently active in the process without commuting that disvalue.

That said, Attfield is quite right that evolution does not and cannot establish materialism (Attfield, 2006a, 116). He is also right to point to the defects of Stephen Jay Gould's "non-overlapping magisteria" compromise between science and religion, as originally formulated (Gould, 2002), and to prefer the formulations of that other agnostic defender of evolutionary theism, Michael Ruse. Attfield's chapter on "Darwinism, Disvalues and Design" concludes with a masterly demonstration that predation, and even parasitism, the phenomenon that so disturbed Darwin himself, "form no significant problem for theists" (Attfield, 2006a, 130), a point to which I shall have to return.

In his "God and Evil" chapter Attfield reformulates the classic problem of evil into the proposition that

No other world that God could have created would have had a better balance of good over evil than the actual world, despite the many evils it contains, has or will have. (Attfield, 2006a, 135).

This is a very interesting move, because of course it raises the spectre of Dr Pangloss in Voltaire's *Candide*, and Leibniz' best of all possible worlds. Attfield is well aware of the various critiques of best-possible-world theory. These are summarised for instance in Robert Merrihew

Adams' introduction to his edited *The Problem of Evil* (Adams, R.M., 1990). Particularly relevant to my own reservations is Philippa Foot's point, as cited by Adams, that worlds are not good or evil in themselves, but good or evil for particular persons or projects (Adams, R.M., 1990, 7), and D.Z. Phillips' general rejection of the consequentialism implicit in best-possible-world theory as appropriate to talk about God (Phillips, 2004, 35-46). I note also Marilyn McCord Adams' critique that the God of Jews and Christians is not depicted by those traditions as an abstract value-maximiser, but as one who by grace does more for human beings than they are worthy to receive (cf. Adams, M.M., 1990, 210). I am not yet clear that Attfield's formulation above escapes all these problems.

Attfield goes on to show how the Free-Will Defence to moral evil can function within such a proposition. He challenges the famous anti-theodicy of Ivan Karamazov, who would "return his ticket" if all the goods of the world depended on the torture of a single child, as "a disproportionate judgement" (Attfield, 2006a, 137). Attfield then shows convincingly how the Free-Will and Irenaean defences to moral evil can be combined. When he turns to the more difficult problem of natural evil, he concludes that, without evidence, it is hard for us to suppose that a better natural system could exist (Attfield, 2006a, 141). Though widespread disvalue is conceded, its outworkings are seen to be "systemic preconditions of the flourishing of billions of creatures across the ages, as well as of human capacities and of the human endowment' (Attfield, 2006a, 143). There was in Ruse's phrase "no other way" to realise the range of creaturely values we observe other than a world of natural selection, "complete with predation, parasitism, agony and suffering and (apparent) waste" (Attfield, 2006a, 146, drawing on Ruse, 2003, 333).

In my own monograph I pick up this "only way argument" (Southgate, 2008b, 47-48). Attfield and I would both be profoundly wary of the bolder claim that this is the best possible world. I want only to share the more modest claim with which Attfield ends, that a created world realising the sorts of values we observe would have to be a Darwinian world.

It is a thousand pities that Michael Murray wrote *Nature Red in Tooth and Claw* without Attfield's chapters to draw on. As far as I can see Murray never quite grasps the character of Darwinism, and hence he doesn't grasp the force of the "only way" argument as advanced by Attfield, Ruse and myself, among others. Nor does Murray ever quite free himself from variants of anthropocentrism based on the view that animal suffering is at least in part outweighed by the goods arising for human beings. But he does come somewhere near to Attfield's position in his eventual theodicy, which is based on affirming both nomic regularity—the

importance to all creatures of living in a consistent world, and a world moreover in which creatures evolve pain responses to noxious stimuli—and also what Murray somewhat oddly calls a chaos-to-order universe (Murray, 2008, 166-92). I suppose that roughly corresponds to a Darwinian universe which, although evolution is not of itself directed, has nevertheless manifested a massive increase in complexity over the last three billion years.

#### Reservations as to Attfield's Position

So there are points of contact between Murray's analysis and Attfield's, though I think Attfield's is a much clearer and more biologically-informed account. There are however two instances where I think Murray's account picks up something important. First, he cites the issue raised by Marilyn McCord Adams that

If the good in question requires the evil of treating someone as a means, then no-one has the right to permit that person to be treated in this way, regardless of the supposed greater good it will bring about. (Murray, 2008, 187)

Murray properly points to exceptions within the human sphere, such as quarantining (a sadly topical subject in 2009 with the advent of so-called "swine flu"). But where harms are *systemically* used to promote goods not in those creatures but in others, then there is a charge against the goodness of the exploiter of those individuals, and that is the situation with the harms occasioned by the evolutionary process. This is, in fact, the objection of Ivan Karamazov all over again—if that is how the *system* works, at the expense of the individual sufferer, well then, the protester respectfully and with reason returns his ticket. My own position is that this argument holds in the sphere of evolutionary evil just as in that of moral evil.

Attfield is right to hold that Ivan's argument does not imply that it would have been better for God not to have created at all. Rather I suggest that God's care and love must be operative at the level of every individual, not just in terms of a system that is, on balance, the best that can be achieved. And that leads me on to the second of Murray's insights, which is that evolutionary theodicy must be done using a combination of arguments (Murray, 2008, 193-99). The only way argument in isolation will not do by itself. It fails at the level of the suffering of the individual creature. I would hold that it needs to be embedded within a richer account of the Christian narrative—one that shows that God's care and love is

always operative, and makes a difference to the individual creature. In my own formulation this includes the invocation of God's co-suffering with every creature that suffers, and of Christ's atoning work at the Cross, and it also means postulating a fulfilled life for the victims of evolution in some eschatological state.

This I see as my principal difference from Attfield's position on evolutionary theodicy. In Attfield's book he merely says that the possibility of life after death lies beyond the scope of the present work (Attfield, 2006a, 150), so for all I know he will invoke it in some subsequent study—during what I hope will be a long and fruitful retirement. But I am convinced that merely to argue a theodicy on the basis of God as the consequentialist calculator of values against disvalues does as D.Z. Phillips has so trenchantly argued lead to an arid and even possibly an unholy theology (Phillips, 2004). Hence my insistence on offering what Thomas F. Tracy would call a "thick defence" of the justice of God, one which draws on the whole arc of the Christian narrative of creation and salvation, rather than trusting to a single argument (Tracy, 2007, 157-60). The "thin defence" of offering a single logical argument for God's righteousness in the face of evolutionary suffering may succeed philosophically in showing the logical compossibility of God's goodness and evolutionary evil, and I suspect that is Attfield's objective. But I continue to consider that it is vulnerable to a version of the objection of Ivan Karamazov, and what is more that it does little of itself to enrich our understanding of the God of evolutionary creation, as I have tried to do in my more extended treatment (Southgate, 2008b, Chs. 3-5; Southgate, 2011).

The final component of my theodicy is a sense of the high calling of humanity as having a part in the redemption of the non-human creation. It is particularly interesting to me to see how-in both Attfield's work and my own—the way theodicy is framed has implications for ethics. It seems to me that because Attfield is satisfied with this as the world with the optimal balance of value over against disvalue, without the need to invoke other elements such as eschatological fulfilment, so it is natural for him to work on the basis of a stewardship ethic focussed very much on the preservation of the systems that embody this optimal balance. Whereas the implication of my own approach is that this profoundly ambiguous world stands much in need of healing by God, and that after the Cross and Resurrection of Christ we live in the era of that transformative healing. I therefore argue for a co-redeemerly environmental ethic (Southgate, 2008b, Chs. 6-7; see also Southgate, 2009). The remainder of this chapter will be an exploration of some of these distinctions, and I shall then end on some points of agreement.

## **Issues around Stewardship**

It is familiar ground in recent Christian theology that stewardship, as an image for the human vocation in respect of the non-human creation, is both commonplace—almost now the default position—and yet under heavy attack from a range of scholars. For a recent survey see Berry 2006. Particularly important critiques include Clare Palmer's denunciation of stewardship as being (in the sense in which it is popularly used) unbiblical (Palmer, 1992). Anne Primavesi has condemned the concept of stewardship as exploitative and unecological (Primavesi, 1991, 106-7). Sean McDonagh is concerned that "within the context of this analogy the earth is reified and becomes either inert property to be cared for or financial resources to be managed in a way that gives a good return on the investment". (McDonagh, 1994, 130). Edward Echlin claims that stewardship "easily lends itself to a detached and manipulative view of creation" and that it "has not moved hearts" (Echlin, 2004, 16). Bill McKibben regards it as "so lacking in content as to give us very little guidance about how to behave in any given situation" (McKibben, 1994, 51). Beyond that stewardship carries the implicit presumption that there is some state or character of the non-human creation, knowable by humans. that we are in a position to steward. And Attfield does note this criticism, as deployed by Richard Evanoff (Attfield, 2006a, 198-99). Do we yet know enough about the Earth to consider ourselves its stewards? Here Attfield helpfully responds by pointing out that a stewardly approach must be combined with vigorous use of the precautionary principle "where irreversible harms or the crossing of ecological thresholds are in question" (Attfield, 2006a, 199).

Attfield addresses some of the other classic criticisms of stewardship in his own article in the Berry book (Attfield, 2006b), in turn an amended version of a chapter in *The Ethics of the Global Environment* (Attfield, 1999). The reasonableness of the tone of this rebuttal is classic Attfield. My reaction on reading this piece is merely to note that the rhetorical flavour of an image such as that of the steward does not equate to its currency in philosophical analysis. The image may be carefully deployed by the reasonable philosopher, and yet continue to carry the wrong connotations when bandied around in the literature and politics of environmentalism. However, Attfield does in my view establish that the image of "steward" (I suspect he rather prefers that of "trustee") is at least consistent with sound environmental practice. While he does not convince me that stewardship "has been a central approach" throughout the Christian centuries (Attfield, 2006b, 84), nevertheless he establishes a

plausible continuity between the image of "tending the garden" in Gen. 2 (an image which has found favour with evangelicals, see for example Granberg-Michaelson, 1987), environmental practice in mediaeval Benedictinism, and the explicit adoption of stewardship in the work of Matthew Hale and those who followed him. (Attfield, 2006b, 81-84) His case is that the image need not lead to a sense that the landlord is absent, or that the land is merely a resource to be managed, or indeed exploited or manipulated.

I think it is at least one small pity that my own article on stewardship appeared just at the time Attfield's *Creation, Evolution and Meaning* was itself being published. I would have hoped to persuade him that while stewardship can be one element in a Christian environmental ethic, appropriately deployed in a particular range of circumstances, other emphases are also important (cf. Southgate, 2006). In particular I am concerned that the usual connotations of the word "stewardship" are in terms of caution about the future—"stewardship" of "resources" seeks to provide a future no worse than the present. There is an implication here (which most of the relevant ecotheologians would probably hotly deny) that indeed things tend to get worse, and stewardship is important to protect God's Earth because we do not expect its miraculous deliverance or transformation, at any rate any time soon.

Examples of this approach—stewardship as preservation—can be found in Lawrence Osborn's work (Osborn, 1993), also in *Earthkeeping in the Nineties: Stewardship of Creation* by Peter de Vos et al. De Vos et al talk of the calling of the shepherd to "maintain the flock" (de Vos et al., 1991, 292), and note that the

'commons' face despoiling, if they are not already spoiled. Perhaps, therefore, the call to stewardship of the 'commons' translates to the establishing of governing bodies, capable of restricting the use of the commons (de Vos et al., 1991, 323).

There is no future hope in this ethic—other than, in some advocates of stewardship, a dubiously biblical hope that one day humans might be able to recreate Eden. Given the sometimes casual talk about Eden in some of the ecotheological literature it is very important to question whether the evidence of the biblical witness does in fact point to a restoration of an initial harmony. Hans Urs von Balthasar for one is clear that it does not. He writes: "The New Testament nowhere speaks of the recovery of a lost glory of the original state, but rather of the eschatological achieving of the righteousness and glory of God in his cosmos" (von Balthasar, 1989, 297; cf. also O'Donovan, 1994, 55-56).

Now Attfield seems to me to invoke in *Creation Evolution and Meaning* a much more active vision of stewardship than some, speaking not just of "preservation" but of "rehabilitation" (Attfield, 2006a, 194) but he still uses the language of the steward as "trustee", as "guardian" (Attfield, 2006a, 193). Not only does this language play into the frequently-levelled charge that it makes God appear to be an absentee owner—trustees or guardians are needed because the normal authority of the owner is absent—but it stresses to a greater extent than I think is appropriate the notion that we are to hold on grimly to what God has left behind.

In some recent work, in collaboration with the New Testament scholars David Horrell and Cherryl Hunt, I have been exploring the implicit cosmological narratives lying behind some ecotheologies, and considering them in terms of Northrop Frye's analysis of narrative genre (Horrell et al., 2010). It seems to me that some of the versions of stewardship to which I have referred are based on an implicit narrative that things always tend to get worse, what Frye would term an ironic narrative. Such a narrative receives biblical support, especially in Qoheleth, and God's answer to Job in Job 38-41—an answer described by McKibben as "deeply sarcastic" (McKibben, 1994, 35), as it mocks the notion that humans can comprehend the ways of the world. An ironic, pragmatic version of stewardship would draw sustenance from that type of vision. But what I argue is that that genre of narrative is hard to reconcile with the implicit cosmologies we find in the New Testament, and with the strong conviction in the Pauline corpus that Christian ethics must be eschatological. If we look at the classic passage in which Paul addresses the non-human creation, Rom. 8. 19-22, I think we can see not only the conviction that creation's current condition is regarded as part of God's hope for the future, pregnant with possibilities, but also that creation's future is tied up with the children of God coming into their freedom, a freedom that is glory.

So this is a narrative of hope, and of the believers' struggle to live out their freedom in Christ, a freedom that in turn participates in the liberating of creation. I strongly question whether stewardship, even what Osborn would describe as strong stewardship (Osborn, 1993), can do justice to this vision. So I have suggested—very controversially—that humans have a part, with God, in the healing of the world. So I side with Ronald Cole-Turner in his suggestion that humans can be co-redeemers with God—as also with his comment that we are at the same time "creatures who constantly stand in need of redemption" (Cole-Turner, 1993, 102). My specific suggestion, again controversial, is that humans in their redeemed

freedom might be called to reduce the rate of biological extinction. Thomas Berry has written:

Extinction is a difficult concept to grasp. It is an eternal concept. It's not at all like the killing of individual life forms that can be renewed through normal processes of reproduction. Nor is it simply diminishing numbers. Nor is it damage that can somehow be remedied or for which some substitute can be found. Nor is it something that only affects our own generation. Nor is it something that could be remedied by some supernatural power. It is, rather, an absolute and final act for which there is no remedy on earth as in heaven. (Berry, 1998, 9; cf. also McDonagh, 2004)

Although extinction has been part of the driver of evolution over the last three and more billion years, it is always as Berry implies a loss to the creation of a whole strategy of being alive, a whole way in which God is praised in God's creation. In this eschatological era a sustained initiative to try and limit any further extinction might be our part in God's eventual healing of the world, the reconciliation of all things in Christ (Col. 1.20).

However, the tragedy of our current predicament is that so far from reducing the rate of non-anthropogenic extinction, we are in the process of engendering, through our elevation of the planet's natural greenhouse effect, a sixth great extinction event, estimated even by a document as cautious as the Stern Report as likely to lead a level of extinction possibly as high as 60% of all mammals (Yohe, 2007, 106). So before we can even begin to think of addressing the levels of non-anthropogenic extinction, there is a vital imperative to address a deepening crisis engendered or at least greatly exacerbated by human activity, that of climate change. And here is where I come back more onto Attfield's ground, because this is an example I believe of where stewardship language can be helpful. Things are indeed getting worse very quickly, and active management to preserve elements of the biosphere, possibly even including major projects in the translocation of species, will surely be necessary. I have recently proposed as a thought-experiment the possibility of moving polar bears to the coast of Antarctica (Southgate, 2009, 262-65).

I was particularly fascinated, when I was reading out Attfield's paper in Crete, to see that he and I were working along similar lines in environmental ethics. Both of us were considering as a priority the need to give voice to the voiceless, to empower those whom the current crisis is rapidly disempowering. Attfield's emphasis in that paper (now published in *The Journal of Global Ethics* (Attfield, 2009b)) is on empowering the poor so that they can also take up the call to stewardship and trusteeship.

And he also has a strong sense of future generations as partners in the project of stewardship—he describes "the true subject of stewardship" as "an intergenerational collective" (Attfield, 2006a, 200). I also have become very interested in the issue of future generations. I am concerned about future human generations as disempowered and dislocated, in some cases losing even the possibility of remaining in their ancient home—one has only think of somewhere like the Andaman Islands, a locus rich in unusual culture and language but much of it likely actually to disappear as ocean levels rise. But I also consider in recent work future generations of non-human creatures which may lose even the opportunity to exist, let alone flourish, as a result of climate change. These, it may be argued, are the new *anawim*, the new poor to whom we should be paying attention as God's special care and concern (Southgate, 2009, 258-60).

I have been arguing strongly and explicitly from the standpoint of Christian ethics, and I have shown that my approach leads me sometimes to a rather different emphasis from Attfield's, but sometimes into some interesting convergences. I would like to note lastly that Attfield's appeal to "secular stewardship" (Attfield, 2006a, 201-2) provides a valuable meeting ground with ethicists of other faiths and none, and may therefore be much more influential in the current context than an appeal to an eschatological Christian ethic. And I think Attfield makes a fascinating observation when he talks of how widespread the impulse to thankfulness is even among secular environmentalists. This, like the impulse to wonder found even in secularists as rabid as Richard Dawkins, is an intriguing hint of how a response to God may lurk even in the most unexpected quarters.

I end by restating how profoundly grateful I am both to Attfield for his work and for the privilege of speaking and writing in his honour.

#### References

- Adams, Marilyn McCord, 1990, 'Horrendous Evils and the Goodness of God', in *The Problem of Evil*, ed. Robert Merrihew Adams and Marilyn McCord Adams (Oxford: Oxford University Press), 209-21.
- Adams, Robert Merrihew, 1990, 'Introduction', in *The Problem of* Evil, ed. Robert Merrihew Adams and Marilyn McCord Adams (Oxford: Oxford University Press), 1-24.
- Attfield, Robin, 1999, *The Ethics of the Global Environment* (Edinburgh: Edinburgh University Press and West Lafayette, IN: Purdue University Press).
- —, 2006a, Creation, Evolution and Meaning (Aldershot: Ashgate).
- -, 2006b, 'Environmental Sensitivity and Critiques of Stewardship', in

- Environmental Stewardship: Critical Perspectives—Past and Present, ed. R.J. Berry (London and New York: T&T Clark Continuum), 76-91.
- —, 2009a, Review of *Nature Red in Tooth and Claw*, by Michael J. Murray, Review in *Reviews in Science and Religion*, 53, 36-39.
- —, 2009b, 'Ecological Issues of Justice', in *Journal of Global Ethics*, 5 (2) 147-54.
- Berry, R.J. (ed.), 2006, *Environmental Stewardship: Critical Perspectives— Past and Present* (London and New York: T&T Clark Continuum).
- Berry, Thomas, 1988, *The Dream of the Earth* (San Francisco: Sierra Club Books, 1988).
- Cole-Turner, Ronald, 1993, *New Genesis: Theology and the Genetic Revolution* (Louisville, Ky.: Westminster John Knox Press).
- Conway Morris, Simon, 2003, *Life's Solution: Inevitable Humans in a Lonely Universe* (Cambridge: Cambridge University Press).
- De Vos, Peter, de Witt, Calvin, Dykema, Eugene, Ehlers, Vernon, and Wilkinson, Loren, ed. Loren Wilkinson, 1991, *Earthkeeping in the Nineties: Stewardship of Creation* (Grand Rapids, Mi.: Wm. B. Eerdmans, revised edn.).
- Echlin, Edward P., 2004, *The Cosmic Circle: Jesus and Ecology* (Blackrock, Co. Dublin: Columba Press).
- Gould, Stephen Jay, 2002, Rocks of Ages: Science and Religion in the Fullness of Life (London: Vintage).
- Granberg-Michaelson, Wesley (ed.), 1987, *Tending the Garden: Essays on the Gospel and the Earth* (Grand Rapids, Mi.: Wm. B. Eerdmans).
- Horrell, David G., Hunt, Cherryl, and Southgate, Christopher, 2010, *Greening Paul: Rereading the Apostle in a time of Ecological Crisis* (Waco, Tx.: Baylor University Press).
- McDonagh, Sean, 1994, Passion for the Earth: The Christian Vocation to Promote Justice, Peace and the Integrity of Creation (London: Geoffrey Chapman).
- —, 2004, *The Death of Life: the Horror of Extinction* (Blackrock, Co. Dublin: Columba Press).
- McKibben, Bill, 1994, *The Comforting Whirlwind: God, Job and the Scale of Creation* (Grand Rapids, Mi.: Wm B. Eerdmans Pub. Co.).
- Murray, Michael J., 2008, *Nature Red in Tooth and Claw: Theism and the Problem of Animal Suffering* (Oxford: Oxford University Press).
- O'Donovan, Oliver, 1994, *Resurrection and Moral Order: An Outline for Evangelical Ethics* (Leicester: Apollos and Grand Rapids, Mi: Wm B. Eerdmans, revised edn.)
- Osborn, Lawrence, 1993, Guardians of Creation: Nature in Theology and the Christian Life (Leicester: Apollos).

- Palmer, Clare, 1992, 'Stewardship: A Case-study in Environmental Ethics', in *The Earth Beneath: A Critical Guide to Green Theology*, ed. Ian Ball et al. (London: SPCK), 67-86.
- Peacocke, Arthur, 1990, *Theology for a Scientific Age: Being and Becoming—Natural and Divine* (Oxford: Basil Blackwell).
- Phillips, D.Z., 2004, *The Problem of Evil and the Problem of God* (London: SCM Press).
- Primavesi, Anne, 1991, From Apocalypse to Genesis: Ecology, Feminism and Christianity (Tunbridge Wells: Burns and Oates).
- Rolston, Holmes, III., 1999, Genes, Genesis and God: Values and their Origins in Natural and Human History (Cambridge: Cambridge University Press).
- Ruse, Michael, 2003, *Darwin and Design: Does Evolution have a Purpose*? (Cambridge, Ma. and London: Harvard University Press).
- Russell, Robert J., 1998, 'Special Providence and Genetic Mutation: A New Defense of Theistic Evolution', in *Evolutionary and Molecular Biology: Scientific Perspectives on Divine Action*, ed. Robert J. Russell, William R. Stoeger S.J. and Francisco J. Ayala (Vatican State: Vatican Observatory Pubs and Berkeley, Ca.: Center for Theology and the Natural Sciences), 191-223.
- Southgate, Christopher, 2006, 'Stewardship and its competitors: a spectrum of relationships between humans and the non-human creation', in *Environmental Stewardship: Critical Perspectives—Past and Present*, ed. R.J. Berry (London and New York: T&T Clark/Continuum), 185-95.
- —, 2008a, Review of *Creation, Evolution and Meaning*, by Robin Attfield, *Reviews in Science and Religion*, 51, 33-35.
- —, 2008b, *The Groaning of Creation: God, Evolution and the Problem of Evil* (Louisville, Ky.: Westminster John Knox Press).
- —, 2009, 'The New Days of Noah: Assisted Migration as an Ethical Imperative in an Era of Climate Change', in *Creaturely Theology: On God, Humans and Other Animals*, ed. Celia Deane-Drummond and David Clough (London: SCM Press), 249-65.
- —, 2011, 'Re-reading Genesis, John and Job: A Christian's Response to Darwinism', in *Zygon: Journal of Religion and Science*. Forthcoming.
- Tracy, Thomas F., 2007, 'The Lawfulness of Nature and the Problem of Evil', in *Physics and Cosmology: Scientific Perspectives on Natural Evil*, eds. Nancey Murphy, Robert J. Russell and William R. Stoeger, S.J. (Vatican City: Vatican Observatory and Berkeley, Ca.: Center for Theology and the Natural Sciences), 153-78.
- Von Balthasar, Hans Urs., 1989, The Glory of the Lord: A Theological

Aesthetics, Volume VII: Theology: The New Covenant, trans. Brian McNeil C.R.V., ed. John Riches (San Francisco: Ignatius Press).
Ward, Keith, 1996, God, Chance and Necessity (Oxford: Oneworld).
Yohe, Gary, 2007, 'Climate Change', in Solutions for the World's Biggest Problems: Costs and Benefits, ed. Bjorn Lomborg (Cambridge: Cambridge University Press), 103-24.