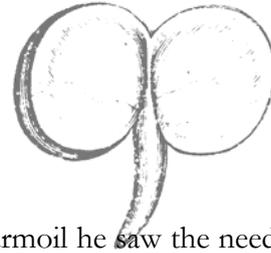


JOHN RAY, FATHER OF NATURAL HISTORIANS

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His greatness is that in a time of transition and universal turmoil he saw the need for precise and ordered knowledge, set himself to test the old and explore the new, and by dint of immense labour in the field and in the study laid the foundations of modern science in many branches of zoology and botany... he did as much as any man of his time to develop a new understanding and interpretation of religion; more perhaps than any man he enabled the transition from the medieval to the modern outlook.

Charles Raven (1942:12).

It is necessary to read between the lines when someone is praised for their contributions in a time of change. Sometimes the meaning is that the person concerned preserved stability during a period of potential chaos, enabling a peaceful succession. On other occasions, the interpretation should be that he (or occasionally, she) was a sane revolutionary, enabling a new order while maintaining a link with the past. We do not have to hedge about John Ray: he was both a man of his own generation, carrying on but improving the traditions he inherited; but he was also an innovator, blazing the way for a truly modern view of the natural world and setting forward a theological coherence which we are only just beginning to appreciate.

Nor do we need to question the social and intellectual turbulence of Ray's times: he lived during the flowering of the Age of Reason, from Galileo's debates in Rome through to John Locke and David Hume; agricultural "improvements" and industrialisation with its associated urbanisation were beginning during his life time; the Great Fire and the Great Plague occurred when he was middle-aged; Ray was an early fellow of the Royal Society, being admitted in 1667, seven years after the Society's founding; and he shared in the adolescence of the reformed Church in England, resigning his fellowship of Trinity College, Cambridge because of his reservations about the 1660 Act of Uniformity.

During the last quarter of the seventeenth century, Ray published under his own name or that of his pupil and patron Francis Willughby, classifications of the major groups of animals and plants, taking a major step towards a natural system and preparing the way for Linnaeus (1707-78) both in terms of method and data¹. The French biologist Baron Cuvier described Ray as "the first true systematist of the animal kingdom... his works are the basis of all modern zoology" (cited by G S Boulger, 1896, in the *Dictionary of National Biography*). Gilbert White regarded Ray as his mentor, both scientifically and theologically (Mabey, 1986). He extolled him to his friend Daines Barrington as "Our countryman, the excellent Mr Ray [who] is the only describer that conveys some precise idea in every term or word, maintaining his superiority over his followers and imitators, in spite of the

¹ Raven (1942: 87, 306) comments, "Without Ray's preliminary work, there could have been no Linnaeus... the fame of Linnaeus and his jealous and critical attitude towards Ray have obscured the value of Ray's work"

advantage of fresh discoveries” (letter, 1 August, 1771, cited by Boulger, 1896). It is wholly justified for James Duncan (1835) to write of Ray, “Combined with learning of the first order and an integrity of life seldom equalled, justly entitle him to the grateful remembrance of his countrymen and the appellations of ‘Father of Natural History’², ‘Aristotle of England’ and ‘the Linnaeus of his time’ which some have bestowed on him”.

Natural History Today

Ray’s reputation was firmly established in the so-called Enlightenment decades between his own time and the publication of William Paley’s *Natural Theology* (1802)³, a dull period occupied by dull people, in Raven’s (1954) judgement. Unfortunately, Ray’s glory and title as ‘Father of Nature History’ has been diminished; the stature and in due course, the relevance of natural history became debased by its use as a “proof” of God’s design of creation. Ray’s most enduring publication was his *The Wisdom of God Manifested in the Works of Creation* first published in 1691 and reprinted many times in the next century and a half (Keynes, 1951). William Derham based his Boyle Lectures of 1711-12 on the *Wisdom*, fully acknowledging in the published version “my Friend the late great Mr Ray” (Derham, 1713). Derham encapsulated and stimulated the eighteenth century enthusiasm for natural theology, inexorably leading to the concentration on deism at the expense of theism, culminating in Paley’s works and the Bridgewater Treatises.

This era ended when Darwin comprehensively scuttled the restricted deist notion of God as nothing more than a clever designer⁴, and sidelined the notion of natural theology as practised up to his time. This was one of the major elements of the Darwinian “revolution”. In the preceding century, “natural theology flourished in England not because of a peculiar English mentality but because there were social and political circumstances that gave the English Enlightenment a distinctive character. From 1688, the constitution had incorporated demands - such as representative government, the sanctity of property, and a degree of religious toleration - that, in other European countries, remained on the agenda of reformers. England, early in the eighteenth century, was almost alone in that Enlightenment hopes were accommodated, rather than thwarted, by the existing order of state and society” (Brooke, 1991:200).

One effect of this perception was that the condition of the natural world was assumed to mirror God’s will for society, and hence was a profitable exercise for Christian study. This produced an understandable revulsion against anything legitimising change, which explains in part, at least, the resistance expressed by Samuel Wilberforce in his infamous British Association debate with Thomas Henry Huxley. Merrill (1989:42) comments that natural theology provided a suitable moral skeleton for natural history in the nineteenth:

² This is the earliest reference I know to Ray as “Father of Natural History” although it may well have been current by the beginning of the nineteenth century. Raven (1942:xiv) describes Duncan’s memoir as “pleasant but secondary”.

³ Raven (1942: 452) notes that “Paley seldom quotes it [*The Wisdom*] by name, but repeatedly borrows from it without acknowledgment: indeed almost its whole contents are found rewritten but easily recognisable in his pages.”

⁴ John Polkinghorne (1988:15) believes that “natural theology is currently undergoing a revival, not so much at the hands of the theologians (whose nerve, with some honourable exceptions, has not yet returned) but at the hands of the scientists. There has grown up a widespread feeling, especially among those who study fundamental physics, that there is more to the world than meets the eye... Thus a physicist such as Paul Davies, who is notably unsympathetic to conventional religion, can nevertheless write ‘It may be bizarre, but in my opinion science offers a surer road to God than religion.’”

“In the footsteps of Paley, naturalists like Gosse found that “natural theology made the study of natural history not only respectable, but almost a pious duty”, and as Lynn Barber (1980:23) points out in her fascinating history of ‘the heyday’ of natural history, “there was nothing the Victorians liked so much as a duty”. Furthermore, as Keith Thomas (1983:261) makes clear, “it was the English who went furthest towards what has been called ‘the divinisation of nature’, whereby a walk in the woods or a climb up a mountainside became a pilgrimage (which may account for the British promotion of Alpine mountaineering)”.

This went so far that nature came to be seen as “morally healing”, and so could be approached with a truly religious zeal. J.C. Loudon, founder of the *Magazine of Natural History*, believed that “compared even with a taste for classical studies, for drawing, for painting, or any other branch of the Fine Arts; or for amateur turning [lathe-work], or any other kind of mechanical employment; a taste for Natural History in a clergyman has great advantages. For in contrast to indoor hobbies, nature study finds the naturalist abroad in the fields, investigating the habits and searching out the habitats of birds, insects, or plants, not only invigorating his health, but affording ample opportunity for frequent intercourse with his parishioners” (cited by Allen, 1976:22).

Allen (1976) has identified a number of influences that contributed to the extraordinary flourishing of natural history during the nineteenth century: evangelical religion, middle-class earnestness, the absence of the dampening leaven of professional science, increasing mobility, easier publication through the introduction of steam-driven printing-presses, lithography, and the lightening of paper tax. A survey carried out in 1873 revealed 169 local scientific societies in Britain, of which 104 were professedly field clubs. Most of these had come into being since 1850, a rate of formation of 10 per year (Britten, 1873).

A passion for nature did not vanish with the *Origin of Species* nor the death of Queen Victoria, but it became far less common and often a personal obsession (such as that of the Reverend William Keble Martin in dedicating himself to illustrating the entire British flora: Martin, 1968). But by the end of the nineteenth century, much of the energy had gone out of the traditional natural history movement. In contrast, professional biology developed, largely in the universities, changing the allegiance of some of the more able practitioners; but more significantly, local knowledge became incorporated into national surveys, and local societies either grouped together into regional unions or their members became absorbed into new, national societies. The more successful federations maintained contact with national and metropolitan scientific organisations, especially the research committees of the British Association and, from 1884, the British Association Conference of Delegates of Corresponding Societies (in part modelled on the Yorkshire Naturalist’s Union).

However, the most progressive developments were in recording schemes leading on to national organisation. The best example of this is in Botany. The stimulus for botanical recording seems to have been a letter from H. C. Watson (1831) in the *Magazine of Natural History* advocating the exchange of specimens on a national scale. This led to a regional network of recorders, followed by distribution maps for different species. Then in the 1890s the Smith brothers of University College Dundee proposed a more systematic survey, linking it specifically to local societies (Smith, 1903). A Central Committee for the Study of British Vegetation was established in 1904 to co-ordinate the work. All its members were college lecturers except one who was employed in the National Library, Dublin, but all had strong links with local societies (Lowe, 1976). The Central Committee changed itself into the first Council of the British Ecological Society in 1913 (Sheail, 1987).

The study of the environment is now divided between amateurs and professionals (Berry, 1983). I believe this is to their mutual detriment: the professional does not have easy access to the local knowledge and acquaintance with many taxonomic groups which characterise the amateur, while the amateur lacks guidance and stimulus in the recording which is the sphere in which he (or she) excels. Such apartheid is not complete. Its breakdown is perhaps best seen in the ornithological world, where the British Trust for Ornithology (which developed from the Oxford Bird Census, itself an offspring of the University Ornithological Society) collates details of bird habitats, breeding, movements, mortality, etc., collected by a large army of amateurs; a small band of professionals encourages, uses and liaises with the amateur bird-watchers to the benefit of both. A similar symbiosis in the plant world led to the publication of an *Atlas of the British Flora*, and the establishment of a national Biological Records Centre at Monk's Wood, near Huntingdon, which collects data from a number of national recording schemes, and publishes atlases of species distribution. For most groups, the bulk of the data is collected by amateurs.

What are the motives behind such amateur dedication and enthusiasm? I believe they have the same roots as inspired John Ray. In his flora of Cambridgeshire he wrote (Ray, 1660, cited by Baldwin, 1986:25):

“First I was fascinated and then absorbed by the rich spectacle of the meadows in spring-time; then I was filled with wonder and delight by the marvellous shape, colour and structure of the individual plants. While my eyes feasted on these sights, my mind too was stimulated. I became inspired with a passion for Botany, and I conceived a burning desire to become proficient in that study, from which I promised myself much innocent pleasure to soothe my solitude.”

Such a passion still exists and is multiply documented. For example, John Barrett (1986:36) has written of the excitement of setting up a Field Centre (Dale Fort in Pembrokeshire) after the Second World War:

“The trickle of interest in the living world was beginning to run around us. More and more, not only in universities and then in schools, but also amongst increasing numbers of citizens from every corner came the understanding that the world was full of marvels which they could not see and would not recognise if they were before their eyes. Somebody had to show the way. We hoped we might be able to help in doing so... All of us already knew that the whole was greater than the sum of its parts. What we would show was how different parts of the natural world hung together - plants, animals, rocks, geography, the climate...We understood exactly why G. M. Trevelyan had said that a historian needed a pair of stout boots as much as a library...”

Love for nature is the result of exposure to the real world; it is caught not taught. I look back with gratitude to the four men who infected me: John Barrett of Dale Fort; George Bramwell Evans, a Methodist minister who pioneered “nature trails” on BBC Radio (and who ‘caught’ me young; he died when I was barely nine years of age); Bernard Kettlewell, a country GP who achieved international fame through his work on the evolution of melanism in moths; and John Ray’s biographer, Charles Raven (Berry, 1988). When Raven retired from the Regius Chair of Divinity in Cambridge, he lectured to scientists on the History of Biology. He pointed out how observation of nature (beautifully exemplified by some of the carvings in mediaeval churches) overcame the formal and arid scholasticism of the Middle Ages, and how this led naturally and ineluctably to the Renaissance, then the Reformation, and onto the Scientific Revolution. Raven taught me to challenge authority and to think for myself. He made me realise that Biology comes

from hedgerows and seashores, even though their messages have to be supplemented by textbooks and learned papers.

This is where the circle becomes complete for Ray as “Father of Natural History”, because in Britain ecology is “scientific natural history” and differs from its roots in North America and parts of continental Europe where it tends to be regarded as a branch of physiology (Elton, 1927; McIntosh, 1985). The disciplines of observation and recording developed by Ray for himself have properly and fairly been handed on to all of us who work in the field, whether as amateurs or professionals. It is well demonstrated by Charles Darwin, natural historian *extraordinaire* who, in the words of his *Autobiography*:

“...had no great quickness of apprehension or wit which is so remarkable in some clever men, for instance, Huxley. I am therefore a poor critic; a paper or a book, when first read, generally excites my admiration, and it is only after considerable reflection that I perceive the weak points... On the positive side of the balance, I think that I am superior to the common run of men in noticing things which easily escape attention, and in observing them carefully. My industry has been as great as it could have been in the observation and collection of facts. What is far more important, my love of natural science has been steady and devout.”

Ray did not merely preserve a tradition; he reworked it and handed it on to us in as rigorous a way as the mathematics of his contemporary Isaac Newton.

Natural Theology Today

To the outsider, science is often perceived as a desiccated exercise in quantitative experimentation. The fact that this is incorrect (Edge, 1964; Berry 1996) is unimportant for the present, except for the fact that it disguises and often distorts the motives of scientists. John Ray was a scientist, but not in the restricted modern sense of the word. It is clear from all his writings (and especially *The Wisdom*) that the driving influence in his life was a Christian imperative, not a simple inquisitiveness. He would almost certainly have agreed with the Psalmist, that “Great are the works of the Lord, studied by all who delight in them” (Ps 111:2). He would have reacted against the anthropocentrism of classical economics and the claim that the only value of “nature” is instrumental. Equally he would have been horrified at the pantheism of the New Age or even the fashionable panentheism of process thinkers, on the grounds that they make nonsense of the transcendence and freedom of the Creator, never mind the Incarnation (Fergusson, 1998:83f). On the positive side, Ray would have welcomed Bryan Norton’s (1987) “weakly anthropocentric” recognition of the *transforming* effect of creation. In other words, the natural world has a dynamic relationship with us in addition to and qualifying its use as a resource.

Clarence Glacken (1967:379) complements the description of John Ray as the Father of Natural Historians by describing *The Wisdom* as “probably the best natural theology ever written.” Although Ray believed creation remained in much the same form as at its beginning, he was clear about the three key points of biblical environmentalism:

1. The Earth belongs to God.
2. He has entrusted it to us to care for on his behalf; and
3. He will hold us responsible for our discharge of this trust.

A Church of England General Synod paper (*Christians and The Environment*, 1991) put it:

“We all share and depend on the same world with its finite and often non-renewable resources. Christians believe that this world belongs to God by creation, redemption and sustenance, and that he has entrusted it to humankind, made in his image and responsible to him; we are in the position of stewards, tenants, curators, trustees or guardians, whether or not we acknowledge this responsibility. Stewardship implies caring management, not selfish exploitation; it involves a concern for both present and future as well as self, and a recognition that the world we manage has an interest in its own survival and well-being independent of its value to us.”

This statement was based on Christian assumptions and hence it imposes a greater onus on Christians as that from secular analyses. But there is considerable convergence between Christians and secular conclusions. For example, the UK White Paper on the Environment which formed the formal British submission to the United Nations Conference on Environment and Development in Rio (the Earth Summit) (*This Common Inheritance*, 1990) began with an explicit moral commitment, “The starting point for this Government is the ethical imperative of stewardship which must underlie all environmental policies. Mankind has always been capable of great good and evil. This is certainly true of our role as custodians of our planet. The Government’s approach begins with the recognition that it is mankind’s duty to look after our world prudently and conscientiously... We have a moral duty to look after our planet and to hand it on in good order to future generations”.

This British statement is only one of a large numbers of national and international pronouncements on environmental ethics. Intriguingly and encouragingly, all their variety of content and background can be reduced to ten or so propositions, which implies that they may be widely acceptable (Berry, 1999a). It seems possible that a worldwide environmental ethic may be within reach. The exploration of the World Council of Churches when it set up a programme on Justice, Peace and the Integrity of Creation⁵ may have an endpoint, albeit not one expected by Geneva (Gosling, 1992).

John Ray would have been somewhat bemused by international agreements but there is no doubt that he would have been worried about the undoubted evidence of human damage to the world. Ray believed God had provided in excessive abundance and our role was to manage nature harmoniously under God’s guidance. He followed George Hakewill (1635) in arguing against any decay of nature consequent upon Adam’s “Fall” or for any other reason. Although he wrote about the “dissolution” of the world (Ray, 1692), he argued that this would be in the distant future and would have to be sudden because he saw no evidence of decay in his time. It is not clear what he would have made of apocalyptic warnings of a nuclear winter, ozone holes, climate change, massive extinctions, and so on. It is our growing scientific sophistication that has made us uncomfortably aware of the reality of these effects and focussed attention in an acute way on Paul’s words about creation “groaning” (Rom 8:19f) or the plagues of Rev. 6,7.

This is not the place for detailed Bible exegesis but it is worth quoting Charles Cranfield’s (1974) magnificent *reduction ad absurdum* argument on Rom 8:19-22 because it is a passage which apparently troubled Ray. In the *Dissolution*, he refers to a number of Bible passages which support his contention that the world will be “refined, purified or renewed” (Ray quotes Ps 102:26; Is 65:17, 66:22; Mat 19:28,29; 1 Cor 7:31; 2 Pet 3:13; Rev 12:1, and others), but he sticks on Rom 8:21:21, noting “I omit that... because of the obscurity and ambiguity thereof” (1693 edition, p. 355). Cranfield expounds these verses in a way which would have meshed well with Ray’s general approach:

⁵ The 8th meeting of the Anglican Consultative Council (1990) added to its established four “marks of mission”, a fifth: “to strive to safeguard the integrity of creation and sustain and renew the earth.”

“What sense can there be in saying that ‘the sub-human creation - the Jungfrau, for example, or the Matterhorn, or the planet Venus - suffers frustration by being prevented from properly fulfilling the purpose of its existence?’ The answer must surely be that the whole magnificent theatre of the universe, together with all its splendid properties and all the various chorus of sub-human life, created for God’s glory, is cheated of its true fulfillment so long as man, the chief actor in the great drama of God’s praise, fails to contribute his rational part. The Jungfrau and the planet Venus and all living things too, man alone excepted, do indeed glorify God in their own way; but, since their praise is destined to be not a collection of individual offerings but part of a magnificent whole, the united praise of the whole creation, they are prevented from being fully that which they were created to be, so long as man’s part is missing, just as all the other players in a concerto would be frustrated of their purpose if the soloist were to fail to play his part”.

Derek Kidner (1967:73) used the same analogy of dis-order in a musical performance a decade earlier than Cranfield in commenting on the Fall story in Gen 3: “Leaderless, the choir of creation can only grind on in discord. It seems from Rom 8:19-23 and from what is known of the pre-human world that there was a state of travail in nature from the first, which man was empowered to ‘subdue’ until he relapsed into disorder himself”.

Ray would probably have been able to accept the Cranfield and Kidner exposition of Rom 8, but he would have stumbled over Kidner’s reference to “the state of travail in nature from the first”. Sure proof of extinctions in fossil faunas came almost a century after his death (Lovejoy, 1936; Mayr, 1982), and their implications were not highlighted until William Buckland (1836) devoted a chapter to animal suffering in his *Bridgewater Treatise*, and argued that animal death must be regarded as qualitatively different from human death. This distinction certainly makes sense of Pauline teaching (as Buckland, 1839, pointed out with reference to Rom 5:12), and emphasises that creation disorder and creation care are not the result of a divine curse, but are our responsibility (Berry, 1999b). In other words, the creation is not simply a stage for God’s saving work for mankind, but provides the focus of his cosmic reconciling work (Col 1:15-20); environmental conservation is a divine mandate⁶ and gospel opportunity⁷ as well as a

⁶ This is the converse of the widespread assumption that a (or perhaps, the) main cause of environmental damage is the Church’s (mis)interpretation of the command to “subdue and have dominion” (Gen 1:28) (White, 1967). Although Christians are far from innocent in their treatment of the environment, they seem to be no more guilty than those of other faiths, including allegedly environmental-friendly Eastern religions (Sheldon, 1992; Oeschlaeger, 1994; Berry, 1995).

⁷ Over the past few years, a number of organisations have been formed to bring together Christians with environmental concerns. They include:

- The Church and Conservation Project within the Arthur Rank Centre at the Royal Agricultural Society of England HQ, Stoneleigh Park, Coventry CV8 2LZ.
- Christian Ecology Link, a membership organisation dedicated to offering insights into ecology and the environment to Christian people and churches (20, Carlton Road, Harrogate HG2 8DD).
- A Rocha Trust, founded in 1983 to put into practice the biblical call to care for creation. It runs Christian field studies centres/ communities in a number of countries (Connans Knowe, Kirkton, Dumfries DG1 1SX).
- The John Ray Initiative, established in 1997 “to bring together scientific and Christian understanding of the environment in a way that can be widely communicated and lead to effective action”, taking its inspiration from John Ray but with no formal connection to either John Ray Trust or the Ray Society (c/o Cheltenham & Gloucester College of Higher Education, Cheltenham, GL50 2RH).

survival necessity. John Ray would have appreciated that, even if the language used by scientists was new to him. For Ray, “loyalty to truth was loyalty to God...he found in the physical world the awe and reverence, the release and inspiration which psalmists, poets, thinkers and explorers have always found.... When Bishop Butler expounded the implications of Ray’s work in his *Analogy*, when John Wesley made its message a part of his philosophy, when Gilbert White gave it worldwide fame, they demonstrated that the Church was ready to abandon its mediaeval *Weltanschauung* and reassert its faith in the works of the Lord... *The Wisdom of God* [provided] a type of theology capable of giving appropriate expression to the Christian faith in a scientific age” (Raven, 1942:455, 478). There is now a healthy attention to environmental theology (e.g. Granberg-Michaelson, 1987; Elsdon, 1992; Northcott, 1997; Fergusson, 1998) and encouragingly this is developing into a substantive theology of creation rather than a specialist interest⁸. John Ray would approve; his spirit lives on.

REFERENCES

- Allen, D. E. (1976). The Naturalist in Britain. London: Allen Lane.
- Baldwin, S. A. (1986). John Ray (1627-1705). Essex Naturalist. Witham: Stuart Baldwin.
- Barber, L. (1980). The Heyday of Natural History. London: Jonathan Cape.
- Barrett, J. H. (1986). How it all began. Biological Journal of the Linnean Society, 32: 31-41.
- Berry, R. J. (1983). The evolution of British biology. Biological Journal of the Linnean Society, 20: 327-352.
- Berry, R. J. (1988). Natural history in the twenty-first century. Archives of Natural History, 15: 1-14.
- Berry, R. J. (1995). Creation and the environment. Science & Christian Belief, 7: 21-43.
- Berry, R. J. (1996). God and the Biologist. Leicester Apollos.
- Berry, R. J. (1999a). A worldwide ethic for sustainable living. Ethics, Place & Environment, 2: 97-107.
- Berry, R. J. (1999b). This Cursed Earth: is ‘The Fall’ credible? Science & Christian Belief, 11: 29-49.
- Boulger, G.S. (1896). Ray, John. Dictionary of National Biography, 47: 339-344.
- Britten, J. (1873). Local scientific societies. Nature, 9:38-40, 97-99.
- Brooke, J. H. (1991). Science and Religion. Cambridge: Cambridge University Press.
- Buckland, W. (1837). Geology and Mineralogy considered with reference to Natural Theology. London: William Pickering.
- Buckland, W. (1839). An Inquiry whether the Sentence of Death Pronounced at the Fall of Man included the Whole Animal Creation or was restricted to the Human Race. London: John Murray.
- Christians and the Environment (1991). A Report by the Board for Social Responsibility. London: General Synod Miscellaneous Paper no. 367.
- Cranfield, C. E. B. (1974). Some observations on Romans 8: 19-21. In Reconciliation and Hope: 224-230. Banks, R. (ed.). Grand Rapids, MI: Eerdmans.
- Derham, W. (1713). Physico-Theology: or a Demonstration of the Being and Attributes of God from His Works of Creation. London.

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- Eco-Congregation is a project of Going for Green, “to encourage, enable and excite local congregations to rejoice in God’s gift of creation; and to encourage and enable the church at regional, national and international levels to make positive responses to environmental issues” (Elizabeth House, The Pier, Wigan WN3 4EX).

⁸ The John Ray Initiative held a theological consultation on the environment in February 1999 (The proceedings are published in Transformation, July 1999). A common reaction of those taking part was that the environment was now perceived as a mainline issue by serious theologians, and not an ancillary or side-issue of low priority.

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- Duncan, J. (1835). Memoir of Ray. The Naturalist's Library. Entomology, vol. II. Beetles: 17-70. Edinburgh: W. H. Lizars.
- Edge, D. O. (ed) (1964). Experiment. London: BBC
- Elsdon, R. (1992). Greenhouse Theology. Tunbridge Wells: Monarch.
- Elton, C. S. (1927). Animal Ecology. London: Sidgwick & Jackson.
- Fergusson, D. A. S. (1998). The Cosmos and the Creator. London: SPCK
- Glacken, C. J. (1976). Traces on the Rhodian Shore. Berkeley, CA: University of California Press.
- Gosling, D. (1992). A New Earth. London: CCBI
- Granberg-Michaelson, W. (ed) (1987). Tending the Garden. Grand Rapids, MI: Eerdmans.
- Hakewill, G. (1635). An Apologie, or Declaration of the Power and Providence of God in the Government of the World. Oxford: W. Turner.
- Keynes, G. (1951). John Ray. A Bibliography. London: Faber & Faber.
- Kidner, D. (1976). Genesis. London: Tyndale.
- Lovejoy, A. O. (1936). The Great Chain of Being. Cambridge, MA: Harvard University Press.
- Lowe, P. D. (1976). Amateurs and professionals: the institutional emergence of British plant ecology. Journal of the Society for the Bibliography of Natural History, 7: 517-535.
- Mabey, R. (1986). Gilbert White. London: Century.
- Martin, W. K. (1968). Over the Hills.... London: Michael Joseph.
- Mayr, E. (1982). The Growth of Biological Thought. Cambridge, MA: Harvard University Press.
- McIntosh, R. P. (1985). The Background of Ecology. Cambridge: Cambridge University Press.
- Merrill, L. L. (1989). The Romance of Victorian Natural History. New York: Oxford University Press.
- Northcott, M.S. (1997). The Environment and Christian Ethics. Cambridge: Cambridge University Press.
- Norton, B. G. (1987). Why Preserve Natural Variety? Princetown, NJ: Princeton University Press.
- Oelschlaeger, M. (1994). Caring for Creation. New Haven, CN: Yale University Press.
- Polkinghorne, J. (1988). Science and Creation. London: SPCK
- Raven, C.E. (1942). John Ray. Cambridge: Cambridge University Press.
- Raven, C.E. (1954). Organic Design. London: Oxford University Press.
- Ray, J. (1691). The Wisdom of God Manifested in the Works of Creation. London: William Innis.
- Ray, J. (1692). Miscellaneous Discourses Concerning the Dissolution and Changes of the World. London: Samuel Smith.
- Sheail, J. (1987). Seventy-five Years in Ecology. Oxford: Blackwell Scientific.
- Sheldon, J. K. (1992). Rediscovery of Creation: a bibliographic study of the Church's response to the environmental crisis. Metuchen, N. J: Scarecrow Press.
- Smith, W. G. (1903). Botanical survey for local naturalists' societies. Naturalist, Hull, 5-13.
- This Common Inheritance (1990). London: HMSO, Cm. 1200.
- Thomas, K. (1983). Man and the Natural World. London: Allen Lane.
- Watson, H. C. (1831). Botanical exchange. Magazine of Natural History, 4: 166.
- White, L. (1967). The historical roots of our ecological crisis. Science, 155: 1203-1207.