Evangelical and Catholic Interactions with Science

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EVANGELICALS AND SCIENCE *by Michael Roberts. Westport, CT: Greenwood Publishing Group, 2008. 304 + xvi pages, series foreword, introduction, primary sources, references, index. Hardcover; $65.00. ISBN: 9780313331138.*

These latest additions to the Greenwood Guides to Science and Religion reflect the recent outpouring of scholarly interest in the field. The series seeks

> … to explore the vast domain of mutually supportive and/or transformative interactions between scientific institutions, practices, and knowledge and religious institutions, practices, and beliefs. A second goal is to offer the opportunity to make comparisons across space, time, and cultural configuration (p. xii, *Catholicism and Science*).

Recent historical studies of science and religion have demonstrated the importance of time and place and the difficulty of drawing broad generalizations. These studies of Catholic and evangelical engagement with science are the latest reminders. One might expect that common interests in the authority of Scripture, the importance of theology, and parallel moral concerns would translate into similar stances by the twenty-first century. Well, yes and no. It is interesting that the Greenwood series lumps Catholics into one book, but Protestants need evangelical *and* liberal versions.

Catholicism and Science

Catholicism and Science (C&S) offers a sweeping 2000-year survey of the Catholic experience—sometimes chronological, at other points topical. The authors seek to avoid a partisan approach to their account:

> Instead, we retain a descriptive approach in which we endeavor to remain attentive to the theological dimensions of various questions and historical episodes (p. xviii).

They also avoid the negative emphasis of Don O'Leary's pioneering study *Roman Catholicism and Modern Science* (2006) which chronicles the magisterium's general reluctance to come to grips with new science even though many Catholic scholars and the laity have accepted it.

Today, one still finds frustration on the part of some American Catholics for what they see as an Anglo-Protestant

These studies of Catholic and evangelical engagement with science are the latest reminders [of the importance of time and place and the difficulty of drawing broad generalizations].

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interpretation of history shot through with anti-Catholic assumptions and prejudices. These include the Catholic-dominated dark and barbarous Middle Ages, Protestants freeing the Western mind from bondage, and the building of the modern world by the Protestant work ethic. This interpretation includes the charge of anti-science based on the Galileo incident and a historiography that emphasizes the role of Protestant (Puritan) Christianity in the early flowering of modern science.[1]

Evangelicals reading this work need to recognize the hold that a hierarchical system of authority and a clergy-dominated educational system has had on the thinking of the Catholic laity—but times are changing. *C&S* is written for use in college classrooms and parish discussion groups, and for the personal enrichment of Catholics and non-Catholics.

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Early Contacts

C&S begins with a broad picture of Christians and science from the time of Jesus Christ to the fifteenth century.[2] Emphasis is placed on intellectual foundations supplied by Hellenistic philosophy, particularly that of Plato and Aristotle: Aristotle's doctrine of the soul as the organizing principle of the body and ultimately all of life, the importance of firsthand observation, and the idea of final cause being key to later Christian thought.

Some church fathers were active naturalists who made careful observation of the world around them. Augustine felt that familiarity with science was important for Christian leaders but warned against recklessly and incompetently expounding on Scripture and being caught out by those not bound by the authority of Scripture. Of note is Augustine's attempt to fit together the literal creation expression "the waters above the firmament" in Gen. 1:6–7 and the Aristotelian physics and cosmology of his day.

Toward a Synthesis of Faith and Learning

Universities were founded starting with Bologna (1158) and followed by Paris and Oxford. Their approach to learning—Scholasticism—was a synthesis of ideas expressed in classical Roman and Greek writings, Christian Scripture, the writings of the patristic fathers, and other Christian authors maintained by the ideal of *the unity of knowledge.*

Dominican philosopher-theologian Thomas Aquinas (1225–1274) provided the best known and enduring synthesis of the scholastic system in his *Summa Theologiae* and *Summa Contra Gentiles* which became canonical texts after the Council of Trent (1545–1563). Aquinas was careful to define the provisional nature of science and the different principles by which philosophers and faithful Christians should consider a natural object.

Traditional scholars reacted against the importance attached to Aristotle's thought, finding it heretical because of his views of the eternal nature of the world and the division of the soul into divine and human parts. As a result, the Bishop of Paris (1277) condemned 219 propositions drawn from a number of sources—including Aquinas, excommunicating him three years after his death. In an amazing turn, the actions were nullified, and Aquinas was canonized by John XXII in 1323.

A Time of Revolution

The Council of Trent (1545) and the publication of Copernicus's *De revolutionibus orbium coelestium* (1543) profoundly affected the relationship between Catholicism and early science. The first signaled a response to the Protestant Reformation while the second involved a variety of factors and influences that differentiate "the hypothetico-deductive enterprise we know as empirical science … and the predominantly non-empirical natural philosophy of the West prior to 1550" (pp. 25–6). The Council of Trent was significant too in (1) placing the interpretation of Scripture with the magisterium, (2) centralizing the Inquisition and the establishment of the Index of Prohibited Books, and (3) establishing the Jesuit order which evangelized (and spread science) to the world, built academic institutions, and engaged in science.

The Copernican recycling of the heliocentric hypothesis overturned the scholastic synthesis of Ptolemaic astronomy and Aristotelian physics and theology, and offered a new way of viewing the world and its neighbors—one that took a long time to catch on. Ironically, the Catholic Church nurtured the very institutions and ways of thinking that

would help to break apart scholastic natural philosophy—including the establishment of the Vatican Observatory. Cherished ways of thinking would be severely tested by the "Galileo affair" which continues to symbolize diverse causes.

Galileo is properly treated by the authors who discuss multiple points of contention rather than the stereotype of science vs. church. These include conflicting worldviews, differing views on the role of sensory experience and mathematics, politics, biblical interpretation, academic turf wars, and a lack of humility. Hess and Allen agree that Catholic contributions to science significantly diminished after the Galileo trials. Catholics could not engage in chemistry or chemical medicine because of their association with magic and the darker arts. Advocates of atomism and Descartes' matter theory were likewise suspect. Yet, a qualified and gradual accommodation of these disciplines to theology took place—however reluctantly.

Time and Nature

The eighteenth and nineteenth centuries focused on the role of time in the changing structure of the earth and biological diversity. Catholics and Protestants alike needed to deal with

> the discovery of the deep history of time and the supplanting of a miraculous with a naturalistic explanation for the diversity of life on earth. Not only science, but philosophy, theology, and every other discipline would be irrevocably altered (p. 62).

Biblical chronology was challenged by the discovery of fossils, but longstanding views of Pliny and the obsession with an emblematic view of living things remained until the late seventeenth century. The English "physico-theology" movement emerged; it was exemplified by John Ray's (1627–1705) *The Wisdom of God Manifested in the Works of Creation* (1691), which was followed by similar *Wisdom* works that furthered the design argument with the smallest of natural details. This restatement of the scholastic argument—proof from a final cause—had been part of St. Aquinas's theological system. In spite of critiques by Hume and others, the movement endured into the nineteenth century (and to the present) to include William Paley's *Natural Theology* (1802). Catholic convert priest-geologist Nicholas Steno studied fossils and Tuscany's geology in great detail from 1667 to 1670. He drew together his observations in a fashion that spelled out most of the principles of modern geology in a broader biblical framework that included Noah's flood.

The eighteenth century saw natural history become part of university culture and morph into today's discipline of biology. A secular science would become the norm as teleology, physico-theology, emblematic distinctions, vitalism, and the Bible were set aside for a mechanistic interpretation of life. In *Les époques de la nature* (1778), Comte de Buffon suggested that the earth originated much earlier than the 4004 BC date of Ussher. Based on the cooling rate of iron, he calculated that the age of the earth was 75,000 years. For this, he was condemned by the Catholic Church in France and his books were burned. The process of accommodation to the scientific consensus of an earth of immense age and an evolutionary picture of biological change was painfully slow.

Convert Cardinal John Henry Newman's *The Idea of the University* (1858) offered a resounding affirmation of the ultimate unity of truth, suggesting that theology and science "are incommunicable, incapable of collision, and needing at most to be connected, never to be reconciled" (quoted on p. 72). He would endorse his friend biologist St. George Mivart's evolutionary ideas.

"Until recently
the great majority of naturalists
believed that species were
immutable productions,
and had been separately created."
-Charles Darwin

Catholic reaction to Darwin's *Origin of Species* (1859) was initially cautious. Two councils and Pope Pius IX warned against holding scientific views contrary to church doctrine and Scripture in a battle to protect the church against modernism. On the one hand, the sciences were valued, even used in detecting attacks on the Sacred Books, but on the other hand, Pope Leo XIII (1893) declared that the magisterium had the "right and responsibility to enforce an interpretation of scientific evidence consonant with

Scripture" (p. 75). Resistance to evolution was based more on a resurgent Neo-Scholasticism than on biblical literalism.

English anatomist St. George Jackson Mivart's *On the Genesis of Species* (1871) found it possible to reconcile Catholic teaching with an evolutionary stance framed by a Christian worldview. Fr. John Augustine Zahm, professor of chemistry and biology at Notre Dame University (1875–1892) is also cited as an important Catholic apologist for the harmonization of theology with evolution. Each would pay a price for his ideas.

In America, the discussion over evolution was allowed to continue. [Here (and later on) the authors make much of the distinction between discussion and prohibition. They forget that actions surrounding the discussion (perhaps threats and warnings) would place a damper on Catholic involvement in science and the treatment of the origin of humans in Catholic educational institutions.] St. Louis Seminary science professor Martin Brennan's *The Science of the Bible* (1898) concluded that Darwin's theory was wrong based on science and Scripture. However, Peoria, IL, Bishop John L. Spalding noted that

> … one may admit the general prevalence of the law of evolution without ceasing to believe in God, in the soul, and in freedom (quoted on p. 86).

On the continent, biologists usually carried the torch for evolution. German exegete Joseph Knabenbauer (1877) was confident that "the article of faith contained in Genesis remains firm and intact even if one explains the manner in which the different species originated according to the principle of the theory of evolution" (quoted on p. 79). In general, Catholics found it difficult to assimilate evolution and related fields, such as paleontology, into their theological system.

Gregor Mendel unwittingly contributed to the development of evolutionary theory. Teaching physics at the Augustinian Order of St. Abby in Brno, he took up the question of genetic variation in plants—cultivating and investigating a remarkable 29,000 pea plants. His controversial paper was published in 1866, but it was rediscovered long after his death and became a major factor in the neo-Darwinian synthesis.

The Twentieth Century

The twentieth century would be characterized by the quickening pace in science, an increasing secularism in society, a wide acceptance of biblical criticism, serious efforts to replace Thomism with other philosophical systems, and a struggle to demonstrate that the Catholic Church could change with the times. Yet, it would seem that a gulf between the hierarchy and scientists would increase as time passed.

Pope Pius XII was an enigmatic figure in the changing attitudes of the hierarchy toward science. He engaged the scientific culture in ways that opened the gates, however cautiously, for Catholics to engage in scientific work that was antithetical to traditional Thomism and biblical interpretation. Mathematician-priest Georges Lemaître's 1927 proposal of an expanding universe met with the disapproval of many physicists (including Einstein) until the 1965 discovery of the cosmic energy left behind by the Big Bang. Pius XII used Lemaître's ideas in an address to the Academy to support the argument for the existence of God:

> … [Science] has indicated [the cosmos] beginning in time at a period about five billion years ago, confirming with the existence of proofs the contingency of the universe and the well-founded deduction that about that time the cosmos issued from the hand of the Creator (quoted on p. 105).

Lamaître was publicly disturbed with the Pope for this simplistic endorsement.

Pierre Teilhard de Chardin's studies convinced him of the validity of evolution as basic to understanding the meaning of human existence. Taking evolution as his key idea, he saw the whole universe as an evolutionary process—which he called cosmogenesis. Everything in the universe, including humankind, was bound together in complete organic integration. His superiors in the Society of Jesus believed him to be overly optimistic about the problem of evil, heterodox in his interpretation of the Fall of humanity, and having pantheistic tendencies. Barred from teaching in France, his major writings were not published until his death. The authors consider Teilhard's doctrine difficult to reconcile with either an orthodox Christian teaching or a scientific theory of evolution. Yet it has influenced scholars from Charles Raven, John Haught, and ecological

thinker and theologian Thomas Berry to a cluster of New Age advocates.

American Catholic concern for a mid-twentieth-century lack of Catholic participation in science research by individual Catholics or Catholic institutions of higher learning led to the establishment of the Albertus Magnus Guild.[3]

Vatican II

Vatican II (1962–1965) marked a move to new traditions that included celebration of the Mass in the local language, a reaching out to the world characterized by papal visits to many non-Catholic venues, and a loosening of the monarchical image. Yet the authors note that "the ongoing series of interpretations of the Second Vatican Council reveal a great deal of flux and tension amongst church leaders over the theology of the Church" (p. 118). Vatican II maintained the doctrine of sin entering the world through Adam and Eve but was silent on the question of polygenism which is crucial to an evolutionary model.

Pope John Paul II seems not to have opened up the dialog with science to any great extent. The 1992 investigation of the Galileo affair would stress the absence of specific proof for heliocentrism and ignore the central role of Pope Urban III in his condemnation. Yet Pope John Paul II deemed the outcome "a hasty and unhappy decision." His positions on ethics and morality often conflicted with those of secular scientists and philosophers. His emphasis on Thomism and natural theology marks a return to traditional thinking. The sometimes obscure papal comments create controversies among interpreters and ambiguity about the Church's views toward science where it touches theology. Today, there exists a broad diversity of views of science and Christianity over the face of the Catholic communities. Benedict XVI, in his first extended reflections on evolution published as pope, noted that Darwin's theory cannot be finally proven and that science has unnecessarily narrowed humanity's view of creation, but he stopped short of endorsing intelligent design (2007).

A number of short essays on current prominent figures in the science-faith discussion follow: these include theologian Hans Küng, priest-astronomer William Stoeger, biologist Kenneth Miller, priest-physicist-historian Ernan McMullin, and theologian John Haught. Clearly, the greater freedom for Catholic thought has resulted in a new interest in the range of issues involving science. Catholics now join with Protestants in faith/science dialog, usually in the context of liberal theology. It would be interesting to see if Protestant young-earth creationists or ID proponents have found common ground with their conservative Catholic counterparts.

Science and Ethics in the Catholic Church

Vatican II turned Catholic discussion away from theological and doctrinal issues to questions related to the lives of people and society in general—a turn that evangelicals were also taking. Popes traveled the world, making headlines with calls for peace and justice for the disadvantaged, visiting national leaders, and taking very visible stances on moral and ethical issues.

The issue of birth control has been center stage during this period. In 1588, Pope Sixtus V's bull *Effraenatum* imposed excommunication on those who used any form of contraception or abortion. The question of artificial conception was discussed by a study group of clergy and the laity in 1967. However, Pope Paul VI refused to accept their recommendations for change. His encyclical *Humanae Vitae* argued that the unitive and procreative meanings of marriage are inseparable. Many Catholic theologians and 90% of the laity today disagree in spite of Pope John Paul II's 1987 ban on further discussion of the subject.

Catholic thought distinguishes between science and nature in terms of *practice* and *reality.* Natural law is framed in a Thomistic philosophy that guides the church in making moral judgments. The idea of natural law embodied in *Rerum Novarum* (1891) assumes that there is a universal law to which people of all races, classes, cultures, and religions have access by their natural reason. Natural law thus serves as a bridge, between church and world, for ethical and social questions.

Beyond the issues associated with reproduction are those related to ecology, human life (beyond the embryo), cloning, stem cell research, euthanasia, sociobiology (human love), neuroscience (soul, death, human unity), and genetic science (eugenics, genetic therapies, original sin). John Paul II's *Centesimus Annus* (1991) was a key component of earlier and more recent papal and bishops' state-

ments on environmental issues. The authors offer the work of Celia Deane-Drummond as one who brings basic aspects of Catholic moral theology to the challenges of genetics. She emphasizes the four classical virtues that guide decisions in individual cases—prudence, justice, fortitude, and temperance.

Current debates on unusual procreation strategies, cloning, and stem cell research challenge people of faith in public life. They must make decisions on questions that deeply divide Americans. Currently, five US Supreme Court justices are Catholics. In the previous two hundred years, only seven Catholics had served.

Concluding Remarks on *C&S*

C&S mainly describes the Catholic hierarchy and cleric-scientists. It is a good introduction to the development of Catholic thought, but leaves the reader without any sense of the place of Catholic nonclerics in the scientific enterprise or the ways that the faithful view science today. How much of this discussion passes down to the laity through the Catholic press? Are Catholic youth encouraged to enter science? How are sensitive topics presented in Catholic schools? Are Catholics represented in science in proportion to their number?

Clearly, the bulk of academic discussion has been carried out by philosophers, theologians, biblical scholars, sociologists, and ethicists who have interests, education, and experience in science. Catholic scientists look to their church for guidance and support as they teach and carry out research that has implications for human welfare, and as they investigate topics that have faith dimensions. Defense of the faith is only part of a larger discussion.

C&S has broken new ground in offering students and the laity a good resource for reflecting on the interaction of their Catholic faith and science. The book is an admixture of fact and opinion, pessimism and optimism.

Evangelicals and Science

Opportunists from H. L. Mencken to Richard Dawkins have managed to distort the public impression of evangelicals as " … a subset of Protestants, who adopt biblical literalism, are anti-intellectual, and reject all science" (p. 7). The well-worn Draper-White conflict thesis offering "historical" evidence of religion's perpetual opposition to science still heads bibliographies and blogs of the twenty-first century despite countering evidence.

Author Michael Roberts has served as pastor and field geologist, and has maintained a long interest in science and Christianity discussions, especially in earth history. His work seeks "to put evangelicals and science *today* into historical and contemporary context" and is written for students and anyone interested in the history of science (p. 2).

Defining the Evangelicals

Evangelicals are the "people of the Bible." They are trinitarian, emphasize the need for personal conversion, recognize the atoning work of Christ, are active in their faith, and committed to biblical authority. These beliefs have played out in different ways in time and place. Evangelicals, perhaps 400 million in number and of great variety, move across national boundaries, denominations, and time. Although this work focuses on the US and the UK, the roots of evangelicalism are found in the churches of the Reformation, and for Americans, in the immigrants who came to America seeking freedom of worship as well as economic opportunity.

About the only constant is that they are rarely Catholics. At times individualistic, divisive, un-Christian in behavior toward those considered liberal, they form many types of parachurch fellowships to further the Gospel and to do good works. They may belong to churches of hierarchical structure, but stoutly maintain their freedom to think as they feel led of God. They include barefoot fundamentalists in a backwoods Kentucky log chapel and some who dine at high table at an Oxford college. Often seeking to serve rather than consort with the powerful, they, with Catholics, have often been viewed with disdain or ignored by the cultural elite.

The Beginnings

While framed by the spirit of the Protestant Reformation, the evangelical movement emerged in the 1730s from orthodox Christians of British and American Protestantism who looked for a revitalized church. The heroes of the early revival of orthodoxy are John and Charles Wesley, Jonathan Edwards, George Whitfield, John Newton, and their precursors, Cotton Mather, Isaac Watts, William Law, and the German pietists.

The movement grew slowly until about 1790 when it began a rapid expansion in the British

Empire and less rapidly in America to become dominant from 1850 to about 1900 when liberalism became prominent. For the next fifty years, "Evangelicalism declined and retreated into the fortress of Fundamentalism, and it was regarded as a spent force" (p. 12).

The gilded age saw an increasingly prosperous middle class move toward mainline churches with impressive architecture, large organs, and a more ritualistic style of service. At the same time, the effects of German biblical criticism were being felt in the seminaries and in the churches served by their graduates. The British churches especially saw a massive decline in influence as modernism became dominant.

Evangelicals met in reaction to the modernist threat in the 1890s at Niagara Falls, NY, but with little effect. One product of their work was *The Fundamentals,* a collection of twelve books published in 1910. Notably, James Orr's (Glasgow, Scotland) article, "Science and Christian Faith," accepted evolution with the exception of humans.

New denominations appeared as religious conservatives split from the mainline churches into "Bible-believing" derivatives. Independent churches and chapels were formed by those tired of hierarchical authority. Despite the fact that old-line theological liberalism was in disarray and decline after World War I, it retained its hold on American institutions of higher learning by effectively shutting conservative views out of higher education. Somewhere along the way, the term *fundamentalist* entered the mix—notably in the famous Harry Emerson Fosdick (1922) sermon "Shall the fundamentalists win?"

The labels—conservative, evangelical, fundamentalist—are hard to pin down in the religious turmoil of early twentieth-century America. Fundamentalism moved from defending the faith to a more negative position—involving a rigidity of understanding, negativity toward higher education, hardline defense of positions, disdain of fellow Christians over secondary matters, and guilt by association. Christians, having abandoned the institutions of higher learning, established many Bible schools and Bible colleges. By and large, academic scholarship was abandoned for an authoritarian approach to higher education.

Dispensationalism, developed by Plymouth Brethren J. N. Darby, was embodied in C. I. Schofield's extensive notes in his widely used Schofield Reference Bible (1909). Dispensational premillennialism became the norm in non-Reformed churches well into the twentieth century through a network of Bible schools and summer conferences throughout the US.

Evangelicalism in the Twentieth Century

By the 1920s the fundamentalists had largely replaced the American evangelical movement. New denominations, independent churches, seminaries, and Christian colleges served those who had been the losers in the battles over control of denominations and educational institutions. The 1925 Scopes trial in Dayton, TN, highlighted the fundamentalists' opposition to evolution—a defining moment for the warfare thesis.

As early as 1910, evangelical students at Cambridge University had broken away from the Student Christian Movement because of their promotion of modernist theology. A number of Christian Unions were founded at various British universities—curiously unmentioned by Roberts. In 1928 a number of these groups joined together as the InterVarsity Fellowship, later imported by Canada and the US.

The realignment of Protestant Churches in this period resulted in a gradual reduction in the membership in the mainline churches while the majority of American Christians were found in new associations. There were those in the US and UK who hung on in the old church seeking renewal from within. The Post-WWII revival of American evangelicalism saw gains in number, education, political influence, social responsibility, and theological sophistication that continue into the twenty-first century. The UK has seen similar, but more muted changes.

Evangelicals, the Bible, and Science

Roberts views evangelicals at a popular level today as desiring to reconcile science with the Bible using a *literalistic* approach rather than one which requires *interpretation*. This approach emphasizes the Fall of Adam which brought suffering and death into the world and the need for a Savior who conquered death and forgives sin—views that fit into popular evangelistic strategies and young earth creationism. Scholarly studies find interpretative value in the

past in considering current issues. Yet the ghosts of the past may hamper attempts to break new ground.

Pre-Evangelical Views on the Nature and Interpretation of Scripture

Roberts reaches back to the early church fathers to locate the roots of the evangelical attitude toward Scripture. Evangelicals differ from liberals in viewing the Bible as a communication from God, not just as a record of human experiences with God. The Reformation distinction of *Sola scriptura* emphasizes its *final* authority in matters of faith and doctrine, not as the *only* source for gaining knowledge. He notes particularly the valuing of nonbiblical knowledge by early church fathers such as St. Augustine and later by Calvin and Luther.

The Reformers' interpretation of Scripture derived from the ways that humanists such as Erasmus studied divine texts. They sought the *literal* sense over against the *allegorical. Literal* here is the record of events that actually transpired, not a "blow-by-blow" detailed chronological account. Another principle of interpretation used by Augustine and later by Calvin was that of *accommodation* which involves the process of adapting, fitting, and adjusting language to the needs and capacities of the hearers.

Evangelical Views on the Nature and Interpretation of Scripture, 1730–1950

Early evangelicals, some highly educated, accepted the Bible as "the ultimate authority" and "Newtonian science" as augmenting God's Word. As the movement spread and deepened, new theologies developed and maturing science brought new ideas about nature to fit into a biblical framework consistent with the "unified knowledge" tradition stemming from the Renaissance. The large number of evangelicals with sparse education had little cause to question a literal interpretation of Genesis. By 1770 geologists such as Cuvier and Hutton had begun to demonstrate the enormous age of the earth. Most evangelicals were content to place the geologist's age into the time of chaos after Gen. 1:1.

Amateur geologist Hugh Miller's posthumous *The Testimony of the Rocks* (1857) led a move to a day-age interpretation by J. W. Dawson and a chaos-restitution interpretation by others. These interpretations went out of fashion until recycled by George Pember as the gap theory and included in the Schofield Reference Bible. It remained popular with fundamentalists until replaced by an extreme literalistic interpretation of Scripture promoted by the US Creation Science movement of Whitcomb and Morris in the 1960s.

Evangelical Biblical Interpretation, Post-1950

The post-WWII educational explosion and revival of evangelicalism led to a deepening of scholarship as doctorates in theology blossomed. Inevitably there has been a shift to more liberal views, but there remain many with traditional fundamentalist views. A lack of Old Testament (OT) scholars has hindered the development of faith-science scholarship. Problems with the OT text concerning historicity and textual inerrancy make it difficult to hew the line in some conservative seminaries and colleges. The roles played by extra-biblical creation accounts, paleontology, and archeology pose additional problems.

Roberts notes the lack of an evangelical scholarly consensus on the early chapters of Genesis: Douglas Kelly, John Carl McMurray, and, more popularly, John Whitcomb represent literalistic six-solar-day worldwide flood readings. Meredith Kline's framework approach avoids the need for a chronological account; Hugh Ross (Reasons to Believe) and Glen Morton are representative of those who hold the day-age view. Various concordistic strategies continue to be discussed as evidenced in the pages of *PSCF.* Americans are far more disposed to employ this strategy than their British cousins. Advocates of evolution tend to favor a framework position or feel that the Bible does not deal with scientific questions.

The Question of Inerrancy

The elephant in the room of any evangelical discussion continues to be inerrancy—the view that the Bible is absolute truth and does not err in its statements. Scholarly studies of the biblical text and science cast doubt on a doctrine framed from Scripture that has been held with varying degrees of nuance. Roberts argues that John Calvin and most of the reformers as well as mid-nineteenth-century stalwarts such as Charles Hodge and B. B. Warfield held nonliteral views on some matters in early Genesis.

Post-WWII evangelical scholarship saw a return to a *limited inerrancy* and the battle lines were drawn. The late 1970s saw various public statements by councils of noted scholars as well as innumerable books. Roberts does an excellent job of

outlining what is essentially an American problem while "most evangelicals in Britain reject or avoid inerrancy" (p. 53).

The Early Evangelicals and Science

"What comparison can there be between saving a soul and analyzing a salt?" (From Henry Venn's 1780 letter to Francis Wollaston, a future professor of chemistry at Cambridge, warning him not to let chemistry take over from his Christian ministry, quoted on p. 68).

Mid- to late-eighteenth-century evangelical clergy generally approached science in a fashion similar to other clerical counterparts. Roberts offers brief treatments of Jonathan Edwards, Thomas Prince, John Wesley, and William Williams. None were in the class of the earlier William Derham and John Ray. Roberts locates the roots of today's evangelical attitudes in the total acceptance of Copernican and Newtonian astronomy and physical science in general, but ambivalence toward the historical sciences like geology and the history of life.

He suggests that eighteenth-century science raised no *evangelical* theological questions. However, Irish Priest John Needham's 1748 experiments on spontaneous generation of living organisms and Comte de Buffon's speculations in his *Natural History* that living creatures evolve according to natural laws, that humans and apes are related, and that all life has descended from a single ancestor, raised the ire of Wesley and others.

The Age of Revolution: 1789–1850

This was the period of great interest in nature by clerics, gentlemen of science, academics, and a few "professional" scientists. Evangelicals interested in science were found at all levels of society.

The design argument reached a peak with William Paley's *Natural Theology* (1802). Taught in the universities for many decades, it would be criticized by some because it focused on God rather than the Redeemer. Yet popular apologists would appeal to proofs from nature for God as preparatory to the Gospel.

Geology raised questions about the role of Noah's flood, the age of the earth, pre-Adamic humans, and whether there was animal death before Adam's fall. In August 1831, Adam Sedgwick provided recent Cambridge graduate Charles Darwin with a crash course in geological practice as the two traveled through the Vale of Clyde to Bangor in North Wales. Early in his career, Sedgwick (and most other geologists) held a catastrophist view that the earth's surface was shaped by sudden, short-lived, violent events that were sometimes worldwide in scope—among them Noah's flood. By 1850, most geologists had moved to a uniformitarian view that geologic change occurs slowly over long periods of time punctuated by occasional natural catastrophic events that have affected Earth and its inhabitants—the Flood had disappeared from geological sight. A mind-numbing collection of clerical, amateur, and professorial geologists on both sides of the Atlantic and their harmonies of Genesis and geology or anti-geologies are portrayed.

Roberts argues that Sedgwick became more cautious of attributing geological features to God's direct intervention in the normal path of nature. As an early critic of Thomas Chamber's *Vestiges of the Natural History Creation* (1844) for its mistakes in using fossils to support evolution, Sedgwick also criticized Darwin's *Origin of Species* (1859) for its lack of rigor in rejecting "'the true method of induction' and coming out with speculations as 'wild I think as Bishop Wilkin's locomotive that was to sail with us to the Moon'" (quoted on p. 93). More serious were moral and theological concerns he raised in a friendly letter to Darwin: "Tis the crown & glory of organic science that it *does* thro' *final cause,* link material to moral; … You have ignored this … " (quoted on p. 93).

The Post-Darwinian Evangelicals

We now enter ground whose scientific and religious dimensions have been explored in various ways by James Moore, John Brooke, Peter Bowler, and Geoffrey Cantor, among many others. By 1900 more of the educated evangelicals accepted evolution—excluding humans—but there was no consensus about the scientific details. Darwinism had been replaced by a guided evolution in which direction or orthogenesis operated.

Robert's conclusion that the "advances in physics, chemistry, or even astronomy … caused no controversy for any Christian, whether evangelical or not" (p. 136) in the last half of the nineteenth century may stem more from a myopic interest in geology. His conclusions are: (1) most evangelicals had no objection to geology, and thus did not insist on a six-day

creation; (2) many were concerned at the possibility of evolution and an existence of humanity for more than Usher's 6,000 years; and (3) "there was a gap between the clergy and the educated layman with many rank and file Christians, who regarded science with suspicion" (p. 137). These conclusions have the feel of validity, but do not take time and place into account.

Lurking in the wings were two small American religious communities who held ideas that would later profoundly influence evangelical ways of viewing science and Christianity. Carl Ferdinand Wilhelm Walter was one of a number of mid-western Lutheran church leaders who actively promoted a young earth, flood geology, and a geocentric cosmology. Seventh-day Adventists emerged in the 1860s out of an earlier millenarian tradition. They worshiped on Saturday based on the fourth commandment and strongly held a literal six-day creation based on that commandment.

The Twentieth Century

Roberts moves into this period by reminding the reader of a fading US evangelical movement troubled by liberalism in mainline churches, and in the UK, by a loss of general interest in the church. Americans tended to form new churches and denominations while the British would stay in the established church as a "beleaguered rump."

Accounts of the 1925 Scopes trial have been long used to perpetuate a "warfare between science and religion" and as a case history of gross historical misinterpretation. Roberts sets things straight and comments that the 1925 issue was the teaching of evolution, while today both evolution and geology stand in the dock. He notes that William Jennings Bryan and evangelist Billy Sunday denounced the popular eugenics movement of the day as inspired by evolution.

The Anti-Evolution/Anti-Geology Fundamentalist "Scientists" Pundits

Seventh-day Adventists, their colleges, and medical schools had opposed evolution and old-earth geology since the mid-nineteenth century. A son of that movement, George McCready Price, wrote a number of anti-evolution flood geology works culminating with *The New Geology* (1923), a work of 736 pages that had the look of a science text of the day. Price gained significant influence in conservative evangelical circles in the US, but not in the UK. Roberts is right in viewing the influence of Price and later Presbyterian minister Harry Rimmer, *The Harmony of Science and Scripture* (1936), a nonscientist critic of geology and evolution, as selective. Yet Price managed to gain the attention of AAAS journal *Science* editor James M. Cattell who published an article by an academic geologist which roundly panned Price's ideas and lack of qualifications.

American anti-evolutionists formed a number of short-lived Bible and science organizations which inevitably failed because of disagreements among their founders. However, the faithful would hear of their ideas in summer Bible conferences and other venues and would provide fertile ground for the creationist explosion of the 1960s.

British evangelicals went into a decline after 1900. Most accepted evolution except when it came to the human soul or when it served as a basis for discarding the Fall. Articles critical of evolution appeared in the pages of the *Journal of the Transactions of the Victoria Institute* and the *Evangelical Quarterly*. Ambrose Fleming, Douglas Dewar *(Difficulties of Evolution)* and L. Merson Davis *(The Bible and Modern Science)* were scientists involved with the Evolution Protest Movement which became the Creation Science Movement in 1980.

A New Engagement with Science

The need represented by earlier abortive Bible-science groups still remained in fundamentalist circles. In 1941, the American Scientific Affiliation (ASA) emerged from dispensational/Bible institute roots and daunting circumstances to form an enduring base for evangelical thought and action. The founding fathers and the first ASA Council initiated an organization that would be the scientific component of the American evangelical post-war renaissance—uncertain at times, feisty, maligned, underfunded, and often ignored by those it sought to serve. Stoner, Kulp, Ramm, Hearn, Hartzler, Bube, and Morris are but a few of the early participants in an enduring discussion. While the ASA seems obsessed with origins questions, it has been at the front of emerging scientific issues ranging from the environment to stem cell research and worldview questions broadly involving Christianity and science. Roberts suggests that the first two decades of the

ASA led to a new openness by evangelicals to all science and unwittingly to a new and vigorous form of young earth creationism (p. 160).

Our British cousins also have an organizational history—beginning with the Victoria Institute (founded 1865), created in part to counter *The Origin of Species.* In 1944, InterVarsity leader Oliver Barclay began a series of annual conferences on science and religion which became the Research Scientists Christian Fellowship and in 1988, Christians in Science (CiS). Barclay, R. E. D. Clarke, Reijer Hooykaas, Donald MacKay, Robert Boyd, and Malcolm Jeeves provided early leadership. CiS joined with the Victoria Institute in publishing the journal *Science and Christian Belief*. Conservative statements of faith by both organizations would exclude from membership some who would become important in later science-faith discussion. The ASA and CiS have strong ties and hold regular joint meetings.

The Rise of Creationism: Young Earth Creationism and Intelligent Design, 1961–2007

Roberts[4] is clear about the importance of young earth creationism (YEC) in the English-speaking world. Answers in Genesis (1991) and the Institute for Creation Research (1970) are the most important of many US organizations along with innumerable internet clones and blogs. The UK has seen the growth of creationism in mainline Anglican and Methodist churches due to the growing numbers of evangelicals in those bodies. YEC has made major inroads in New Zealand, Australia, and Canada. Roberts finds the growing Third World church very susceptible to YEC interpretations—the dominant understanding of Christians in Latin America, Africa, and Asia.

As creationism gained in power among the evangelical right, moves were made to include creationism and (later) intelligent design in science courses in the public schools. Arguments about "equal time," "critical thinking," and "teaching the controversy" were argued in post-Scopes trials using scientists, historians, and philosophers as expert witnesses. Opponents of anti-evolutionists include Talk.Origins, the Panda's Thumb blog site, and innumerable atheistic websites and blogs. *PSCF* readers are familiar with the religious and scientific strategies used to further the YEC cause. An earlier variety of choices has now been reduced to either atheistic evolution or seven-day creation.

The 1980s saw the introduction of Intelligent Design (ID) to the anti-naturalism arena. Roberts provides a nuanced account of this new twist on the teleological argument for the existence of God, modified to avoid the nature or identity of the designer. The well-funded ID movement has had significant influence in the English-speaking world and beyond. Curiously, the YEC community opposes ID because its promoters are indifferent about the earth's age and accepting of some levels of evolution.

Environment and Bioethics

The discussion of views on origins and design has been joined in recent decades by equally contentious environmental and bioethical questions. The response by evangelicals to overpopulation, abortion, genetic engineering, stem cell research, and global warming is complex—often heavily politicized. The ASA and CiS have regularly offered discussions of the issues in their journals and meetings.

Evangelicals, such as Loren Wilkinson, Cal DeWitt, and Richard Wright on the American side and Sam Berry, John Houghton, and Ghillean Prance among many in the UK, have worked professionally to advance green themes. Opposition has been sharp on the right by browns, such as nonscientist Calvin Beisner who has offered a theological basis for his "Cornucopia hypothesis" of unlimited growth. While TV evangelists, "health and wealth" advocates, and "other worldly" Christians are often naysayers, many (especially younger) evangelicals have joined the environmental cause. Evangelical leaders including Francis Schaeffer and Richard Cizik have been strong supporters.

The issues raised by advances in biotechnology have been spelled out by evangelicals Elving Anderson, Nigel Cameron, Gareth Jones, and Oliver O'Donovan, among many others. William Hurlbut contributed to a US Presidential commission on sources of embryonic stem cells (1997). The right-to-life movement in the US has provided the political muscle to mediate research activity.

Roberts closes with a section on medical missions. As on the battlefield, missionary medicine often takes place in non-ideal settings with little protection for the physician. Serving in parts of the world, little touched by mainstream medical research, they have sometimes been the first to note new problems and unconventional treatments.

Essay Review

Evangelical and Catholic Interactions with Science

The Big Picture

Roberts paints a comprehensive picture of evangelicals and science from the American epicenter to the uttermost parts of the earth. In a changing admixture of worldviews, one must choose from a buffet of choices which inevitably have unanswered questions. In the center, the ASA and CiS have long-term roots in their respective spheres of influence. Hugh Ross's Reasons to Believe has a large American influence. On the left, the Institute on Religion in an Age of Science and the Science and Religion Forum provide fellowship and discussion for those of like mind. On the right, Answers in Genesis, the Creation Research Society, and the British Biblical Creation Society serve large communities of believers.

Innumerable organizations, websites, blogs, and other internet media spread their messages in a bewildering maze of conflicting views. Does the average Christian pastor, working scientist, engineer, or layperson really care about the issues unless they strike them personally?

The concluding chapter aptly summarizes today's state of the relationship between evangelicals and science. As with *C&S*, there needs to be more discussion of current evangelicals in science. While centrist evangelicals continue fine-grained forms of accommodation, those pushing the envelope to the left in various forms of open theology and panentheism or in quantum mechanical fluctuations are unmentioned.

Even though evangelicals have received much scholarly attention in recent years, Roberts has provided a unique contribution that offers the novice and active participant much fuel for thought.

Catholics and Evangelicals in Science: Diversity, Complexity, Parallels, and Distinctives—An American View

Today these Christian communities hold much in common ranging from worship styles to how they view science and faith. Immigrant distinctives have worn off in the melting pot and ipod culture. Enduring beliefs and practices still divide the two communities but clergy and laity find common purpose in good works and questions of public morality. I suspect that local churches hold generally positive views on science and environmental concerns. Creationist concerns are far more widely found in evangelical communities.

Scholarly communities exhibit a wider diversity. Catholics range from conservative to strongly liberal while evangelicals find few who stray too far from conservative theology and a high view of Scripture—the conservative constituency that funds the institution acts as its own magisterium. Catholic education generally teaches evolution with traditional reservations about human origins, yet polls show the laity to be on the conservative side. Evangelicals are more inclined to support creationist agendas. Each offers ways of interpreting nature and science distinct from conventional ethics and morality.

Each work engages the conflict (warfare) thesis. Clearly, fundamental and some irresolvable differences between scientific and religious worldviews have and will continue. Questions of authority, the desire to protect the faithful from heresy, and the wish by biblical scholars and scientists alike to freely pursue their work have provoked incidents that seem unnecessary when viewed from a distance, yet appropriate at the time.

C&S primarily displays the detachment of scholars while *E&S* reflects a mixture of detachment and the passionate interest of one deeply involved with the issues. The authors have taken on a daunting task. Paperback versions belong on your bookshelf.

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Notes

[1]See I. Bernard Cohen, *Puritanism and the Rise of Modern Science* (New Brunswick, NJ: Rutgers University Press, 1990); and R. Hooykaas, *Religion and the Rise of Modern Science* (Grand Rapids, MI: Wm. B. Eerdmans Publishing Co., 1972).

[2]The authors follow the line of David C. Lindberg, *The Beginnings of Western Science: The European Scientific Tradition in Philosophical, Religious, and Institutional Context, 600 B.C. to A.D. 1450* (Chicago: University of Chicago Press, 1992) for this period.

[3]Ronald A. Brinzley, "American Catholicism's Science Crisis and the Albertus Magnus Guild, 1953–1969," *Isis* 98 (2007): 695–723.

[4]Roberts closely follows the groundbreaking work of Ronald L. Numbers, *The Creationists: From Scientific Creationism to Intelligent Design* (Berkeley, CA: University of California Press, 1993; expanded ed.; Cambridge, MA: Harvard University Press, 2006).