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# THE DESIGN ARGUMENT IN SCIENTIFIC DISCOURSE: HISTORICAL-THEOLOGICAL PERSPECTIVE FROM THE SEVENTEENTH CENTURY

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When one considers the revolutionary changes brought about through Darwinian and neo-Darwinian science he is ultimately led to an important question: How could modern science have undergone such a dramatic philosophical drift from its earliest theological moorings? From the journals and published writings of the seventeenth-century virtuosi[1] one can scarcely find an example of scientific investigation that is not in some way grounded in a theistic purpose. Yet when Charles Darwin proposed his alternative naturalistic explanation in the field of biology[2] his theory not only challenged existing theistic explanations but also was enthusiastically embraced by the majority of scientists by the end of the nineteenth century.[3] God-fearing scientists of Darwin's era were incapable of answering naturalism as a philosophical system because their theological base of authority had long since been eroded. They had received from the forefathers of science a weak, and sometimes erroneous, theology of nature. Ironically the origin of this faulty theological foundation can be traced to the seventeenth-century virtuosi themselves, whose piety and doxological aspirations for science could scarcely be questioned. Their skill and enthusiasm as scientists and philosophers, however, sometimes exceeded their discernment as theologians.

The natural theology of the seventeenth-century fathers of modern science, which permeated the philosophical fabric of science for two hundred years, contained subtle and significant compromises when compared with

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[1] The term "virtuosi" is used throughout this paper to refer to those natural philosophers in the seventeenth century who actively promoted the growth of natural science. It is chosen in part because it was a favorite term of Robert Boyle, whose views are later featured in the present work. Although the term had a more general meaning earlier in the seventeenth century, one of Boyle's most famous books, *The Christian Virtuoso*, employed it in a narrower sense to mean "those that understand and cultivate experimental philosophy" (*The Works of the Honourable Robert Boyle* [ed. T. Birch; London, 1772] 5.513–514). Since the virtuosi were a heterogeneous group from different classes, occupations and religious affiliations, it suffices to say that the common interest that bound them together was an avid interest in the study and promotion of science. The modern meaning of the word, a musical performer, did not originate until the eighteenth century.

[2] Cf. e.g. C. Darwin, *The Origin of Species* (New York: Modern Library, 1936).

[3] The background of the Darwinian period and its relationship to the nineteenth-century natural theology that preceded it is the focus of an earlier article: J. Hutchison, "Darwin's Evolutionary Theory and 19th-Century Natural Theology," *BSac* 152 (July-September 1995) 334–354.

the truth of Scripture. The far-reaching effects of these concessions were not clearly seen in the seventeenth century by the virtuosi themselves but are later brought to their fruition in the deism of eighteenth-century science and the agnosticism and atheism following Darwin's revolution.

The present paper will focus on the natural theology of three prominent seventeenth-century scientists in England: Francis Bacon, Robert Boyle and Isaac Newton. Their theological views are surveyed not only because they shaped science in this period but also because they chronologically span the entire seventeenth century. The theology of these three men shows a steady progression from the devout Christianity of the early 1600s to the deism of the eighteenth century.

It is the thesis of this paper that the theological slide toward deism and ultimately atheism in science was precipitated by the theological compromise of early scientists in two important doctrinal areas: the authority of Scripture, and the doctrine of sin and salvation. Their theology of nature was a welcomed response to the inadequate medieval view of nature that had discouraged scientific study, but it went too far in its claims about the authority and clarity of nature's revelation. The influential scientific viewpoints of these pioneers contained not only some theological premises that promoted Biblical Christianity but also others that contradicted Scripture and ultimately laid the foundation for deism. The conclusion of this paper will summarize the common elements in the natural theology of the virtuosi that laid the foundation for deism and Darwinism. Since able Christian scholars are presently reasserting the design argument in scientific discourse, this study will seek as well to relate aspects of this historical study to the contemporary debate.

## I. FRANCIS BACON

An English philosopher and statesman, Francis Bacon (1561–1626) was born in London and educated at Trinity College, Cambridge. As a philosopher of science he emphasized the conviction that people are to be servants and interpreters of nature, that truth is not derived strictly from a position of authority but rather through careful investigation. In *Novum Organum* he called prejudices and preconceived attitudes idols that must be abandoned. An eloquent writer and orator, Bacon promoted empiricist thinking, careful observation of data, and accurate experimentation in science. In comparison to Boyle, Newton and other virtuosi, Bacon contributed few technical discoveries in the pure sciences. But he inspired and influenced scientists through his masterful presentation of their field. He worked to reverse the prevalent skepticism of learning that discredited scientific knowledge. Rather than being associated with atheism, Bacon sought to show that real science is actually conducive to religion and a greater faith in God.

1. *The relationship of science to religion.* In promoting the virtues of scientific study, Bacon's intention was never to reject metaphysical truth

but to bring to light the importance of truth from another realm. Medieval scholars had either sadly neglected scientific experimentation or associated it with various forms of pseudoscience like alchemy and astrology. Seeing the importance of scientific advance, Bacon also determined the road it must travel to do so. Truth must be viewed in two distinct categories: the truth of religion, and the truth of science. Because of the superstitious practices of medieval science, Bacon insisted that these different types of truth be kept separate and that the truth of one realm must not be extracted from or mixed with the other. He considered the practice of confirming truths of religion with science or teaching science from religion as mingling things human with things divine. The common practice of looking to Genesis for scientific knowledge about the earth, for example, was an illustration of the corruption of science by mixing it with theology. He sought to separate the scientific process from the subjectivism, superstition and prejudice of theologians.

While Bacon's writings often sound quite orthodox and respectful of religion, his real interest was the purification of science with little interest in what happened to religion. Basil Willey notes:

> He [Bacon] wished to keep science pure from religion; the opposite part of the process—keeping religion pure from science—did not interest him nearly so much. What he harps on is always how science has been hampered at every stage by the prejudice and conservatism of theologians. After three hundred years of science we now have writers pleading for religion in an age dominated by science. . . . Bacon was pleading for science in an age dominated by religion.[4]

Bacon's new posture on the relationship between scientific and religious truth was an important watershed influence in the history of scientific thought. It was a departure from and reaction to the medieval mixture of theology and science, and because of Bacon's skills in communication it carried with it a great deal of weight. As has been noted, Bacon's passion for change was fueled by a desire to purify science, not theology. This led to his bifurcation of truth into two distinct and sometimes opposing categories, as illustrated by the two-book view of revelation discussed below. Because of his commitment to dividing and divorcing these two categories of truth, Bacon's science showed little further interest in the role of Biblical theology as a check on and balance for natural theology.

2. *Bacon's view of nature and the fall.* One of the best illustrations of the reactionary effect to medieval theology is found in a changing view of nature and its relationship to the doctrine of the fall. George Hendry observes:

> Modern science arose out of a revolt against the implicit or explicit imperialism of the theological perspective on nature, or, less violently expressed, by the discovery that there is another way of looking at nature than that of theology.[5]

[4] B. Willey, *The Seventeenth Century Background: Studies in the Thought of the Age in Relation to Poetry and Religion* (London: Chatto and Windus, 1957) 31.

[5] G. S. Hendry, *Theology of Nature* (Philadelphia: Westminster, 1980) 27.

> An important requirement for the rise of modern science was "the rehabilitation of nature," and this . . . was a main achievement of Bacon. Bacon offered a theological reinterpretation of the Fall which limited its effect to the moral order. . . . The most significant difference in this view of nature from that found in the piety of the Middle Ages, in which it was seen as a realm of dark and sinister forces with which it was dangerous to meddle, is that nature has been exempted from the effects of the Fall and reinstated in that pristine perfection in which it issued from the Creator's hand at the beginning.[6]

Although Bacon was not a cleric or theologian he used some theologically sound reasoning to challenge traditional medieval arguments. The forbidden tree in the Garden of Eden, for example, had been symbolically viewed by some as the knowledge of nature, and sin had been seen as a man-centered invasion of this realm. Bacon and other scientists denied this view, claiming that the tree was the moral knowledge of good and evil and not necessarily having anything to do with science. Bacon did not, however, address the statements in Biblical passages that support the idea of a curse on the physical world (Gen 3:17–19; 5:29; Rom 8:20–22), choosing rather to ignore them in his writing. His reasoning was heavily dependent on a view of nature in its pristine condition.

3. *Bacon's view of revelation: nature and Scripture.* As noted above, Bacon's view of science and nature logically resulted in a distinctive view of God's means of revealing truth. Arguing that nature was under the control of God rather than Satan, he claimed that God had revealed himself to man by means of two scriptures: the Bible, and the created universe. Bacon was the first to state clearly the two-book view of God's revelation,[7] which went on to characterize much of the scientific enterprise during the seventeenth and eighteenth centuries. For Bacon and his followers this important tenet became a theological motivation to do science. Natural philosophers (an early term for scientists) saw themselves as priests of a new order, providing insight and guidance to the layman to help him discover more about the Creator and his created world. This revelatory purpose of scientific discovery was a crucial element in changing the popular view of science from a dark, forbidden, Satan-controlled enterprise to the doxological worship of God as Creator.

4. *Contributions and cautions.* Bacon's contribution to the field of science was related more to his philosophy of science than to his specific discoveries. Those who followed his lead gave birth to the powerful enterprise known as modern science and deserve great admiration. Bacon's influence helped release science from its imprisonment to a superstitious, medieval theology of nature. His example dignified scientific research, discovery and development as a worthy pursuit and later an authoritative profession. Science also became a means of pursuing knowledge about God. Bacon's philos-

[6] Ibid. 55–56.
[7] Ibid. 56.

ophy became, in fact, a foundation for the modern formulation of the design argument, supporting the Biblical teaching that the Creator has revealed something of himself in his creation. This theological purpose for scientific study characterized and motivated many early scientists, as it does some today.

One must not fail to notice, however, some problematic elements in the theological foundation laid by Bacon. In his zeal to legitimize the study of natural philosophy, Bacon believed it was necessary to separate completely science and religion. Even his two-book view of God's revelation reflects this separation. While one can immediately see the pragmatic, historical reason for such a split, history has shown that this great divide was heavily laden with consequences. Bacon himself, in seeking to free science from its theological shackles, could not have seen that he was creating the foundation for a new secular theology.

Bacon's insistence on two separate realms of truth and his two-book theory of God's revelation led ultimately to a conflicting authority structure in science and society. Many professionals and laymen, following Bacon and other early scientists, have found the resolution of the question of authority in a separation of realms, the physical and the metaphysical, each having its own laws and authority structure. The real world is not always so neatly divided, however, and even scientists must face metaphysical questions. Although Bacon was a theist, his bifurcation of realms ultimately led to the domination of scientific authority over religion and theology. Naturalism was the inevitable result, a naturalism that today dominates in both the scientific community and society. The laws of naturalism—whether philosophical or methodological—have become the dominant authority structure of all science and much of society.

A second and less obvious area of concern in Bacon's theological base was his failure to incorporate into his views the possibility of a fallen world. What were the effects on the physical world brought about by God's curse in Genesis 3? What about the effects on man's intellectual abilities? Does the enmity that Scripture describes between fallen man and creation place any limitations on his ability to understand fully his world? Even theologically astute scientists debate the relevance of this issue, and Biblical scholars recognize that limited information is provided in Scripture. While the purpose of this paper is not to discuss fully this issue, it is important to note that Bacon's viewpoint was a reaction to the excesses of medieval theology and strongly influenced many to follow him. As noted earlier he believed that the physical universe showed no effects from man's fall to sin, and this became an essential part of his two-book view of revelation. By studying the book of nature, one was not only learning from the Creator but also taking an unspoiled look at God's plan. A perfect creation untouched by sin was seen by Bacon and others as a more accurate, almost inerrant, revelation when compared to the endlessly debated written Scriptures. This view contributed in part to the later claim of science to be a completely objective pursuit of truth when compared to the subjective approach of philosophy or theology. Such views also formed the foundation for eighteenth-century

deism, which denied the reality of sin completely. Bacon himself speaks of the inclination toward goodness being imprinted deeply in the nature of man.[8]

Living shortly after Bacon and opposing his view of a pristine world was the influential cleric Thomas Burnet. While viewed by many as an eccentric, Burnet maintained that the physical world, like man, is a damaged creation. Though in principle it shows some evidence of its Creator's design, that design had been affected by sin.[9] Burnet's views were supported by Bishop Joseph Butler in 1736.[10] Butler, who was opposing the prevailing deism of his day, challenged the notion that nature perfectly and unambiguously reveals its Designer. He was seeking to point out the reality of a sinful world with obscurities and contradictions. Challenges like those of theologians Burnet and Butler had little effect on the seventeenth- and eighteenth-century scientific movement. In reality, however, they were pursuing some of the most important questions.

These were precisely the issues that later troubled young Charles Darwin as he listened to the scientists and natural theologians of his day. The world he observed contained, in fact, many anomalies and imperfections that did not point to an all-wise, omnipotent Creator. Darwin's genius was the formulation of a theoretical natural mechanism that could explain the order as well as the chaos. Evolutionary thinking caught on so quickly in Darwin's era because it looked at the world realistically rather than through the rose-colored spectacles of the nineteenth-century scientist-clerics.[11] As has been demonstrated in the present article, the theological foundation for this view of nature in the nineteenth century had been built in the previous two centuries by Bacon and other early pioneers.

## II. ROBERT BOYLE

Born in Ireland the year after Bacon died, Robert Boyle (1627–1691) was a British scientist known primarily for his work in chemistry. Though educated in Geneva, Boyle ultimately settled in England where he devoted himself to scientific research. He is often called the father of modern chemistry and is the discoverer of Boyle's Law.

Boyle's careful practice of objective observation and experimentation made him one of the pioneering fathers of modern science, but one can add that his commitment to God and the Christian faith even surpassed his love for science. Richard Westfall calls Boyle "the foremost example that the 17th century can offer of scientific investigation impinging on the Christian

[8] F. Bacon, *The Complete Essays of Francis Bacon* (New York: Washington Square, 1963) 34.

[9] T. Burnet, *The Sacred Theory of the Earth*, quoted in B. Willey, *The Eighteenth Century Background: Studies on the Idea of Nature in the Thought of the Period* (New York: Columbia University, 1977) 27–29.

[10] J. Butler, *Analogy of Religion*, quoted in Willey, *Eighteenth Century* 76–94. Willey provides an excellent summary of Butler's position on natural morality.

[11] Hutchison, "Darwin's Evolutionary Theory."

consciousness. . . . Religion, rather than science was the foundation of his being."[12]

1. *The relationship of science to religion.* Boyle saw a close association between theology and science, viewing the discovery of facts about the physical universe as a simultaneous discovery of its Creator. While medieval thinking warned against the spiritual dangers of excessive devotion to science, Boyle, Newton and others considered science to be an excellent school for religion. Boyle added to this the conviction that both science and religion were based on fundamentals that are ultimately beyond man's comprehension.

The natural universe, being the handiwork of God, clearly indicated to Boyle God's existence and suggested qualities about his character. The attribute of God's omnipotence, for example, was displayed in the immense size of the universe, earth being but a speck in the immensity of space. Boyle studied the rotation of the earth, the paths of heavenly bodies, and the number and variety of creatures on the earth and under the microscope, concluding that a God who could create these out of nothing must be all-powerful.[13]

The same world displayed God's wisdom, according to Boyle. Such diverse creatures lived together in a cooperative union, and yet each one displayed in itself an organic unity. Boyle, like many other scientists, was especially stimulated by study of the human body. The eye, he surmised, could never have been invented or designed by human wisdom, thus leading one to wonder at its Creator.[14] It is noteworthy that the human eye produced the greatest consternation for Charles Darwin as he sought to convince others of a naturalistic alternative to the Creator.[15]

Boyle's admiration of God's wisdom also included the recognition of omniscience and was often described in terms of God as an engineer. A machine (the universe) that will function by itself reflects much greater engineering wisdom than one that requires continual regulation by its inventor.

Boyle saw not only omnipotence, wisdom and omniscience in the creation but also God's goodness and love. He was likely influenced in this regard by the Cambridge Platonists who emphasized the same theme. While he did not deny anomalies in this idealized view of nature he attributed them to the ends of a God that are beyond our human comprehension. Why could God's goodness not be shown through the large variety of created works, reasoned Boyle, rather than through the individual perfection of each one? This view of general providence was common among the early pioneers of the scientific movement, who like Boyle believed that God's higher wisdom may view perfection in that which man calls defect. This humble recognition of God as God influenced all of Boyle's observations and conclusions:

[12] R. S. Westfall, *Science and Religion in Seventeenth-Century England* (New Haven: Yale University, 1958) 40.

[13] Boyle, *Works* 2.10–14, 20–25; 5.132–135.

[14] Ibid. 2.44–63; 5.135–139.

[15] H. Gruber, *Darwin on Man* (Chicago: University of Chicago, 1981) 210.

> For the works of God are not like the tricks of jugglers, or the pageants that entertain princes, where concealment is requisite to wonder; but the knowledge of the works of God proportions our admiration of them, they participating and disclosing so much of the unexhausted perfections of their Author, that the further we contemplate them, the more footsteps and impressions we discover of the perfections of their Creator; and our utmost can but give us a just veneration of His omniscience.[16]

2. *Application of the design argument.* Although Boyle recognized the limits of human reason, he believed that man's reason could lead him from knowledge of the physical universe to religious knowledge about God. This was, in fact, one of his chief purposes for studying science:

> God has couched so many things in his visible works, that, the clearer light a man has, the more he may discover of their unobvious exquisiteness, and the more clearly and distinctly he may discern those qualities, that lie more obvious. And the more wonderful things he discovers in the works of nature, the more auxiliary proofs he meets with to establish and enforce the argument, drawn from the universe and its parts, to evince that there is a God: which is a proposition of that vast weight and importance, that it ought to endear every thing to us, that is able to confirm it, and afford us new motives to acknowledge and adore the divine Author of things.[17]

The attributes of God noted above—namely, power, wisdom and goodness—were those most often emphasized in Boyle's reflections on nature. Eugene Klaaren observes that Boyle "consistently reasoned from, not to, the theology of design."[18] Knowing of divines who warned against the study of nature as promoting atheism, Boyle was determined to show the fallacy of their thinking. To his credit he maintained balance in his theological conclusions and did not take teleology to an extreme. He found the study of stars, planets and the heavens fascinating, revealing the vastness of the universe. But he did not use astronomy extensively in his teleological argument because of the unclear purpose for the heavenly bodies. Generally he treated inanimate objects in the same way. His arguments from design most often focused upon living creatures and man, which he reasoned could not have come about by blind chance.[19]

3. *A sense of wonder at God's works.* The doxological purpose for Boyle's study of science is unmistakable and is more evident in his writings than in those of any other pioneer of modern science. Westfall notes:

> More perhaps than any other virtuoso Boyle sought, and found, the hand of God in the creation. Through all of his works runs a never silent melody of enraptured surprise at the Creator's ingenuity. The more deeply he probed into

[16] Boyle, *Works* 2.30.

[17] Ibid. 5.516.

[18] E. M. Klaaren, *Religious Origins of Modern Science: Belief in Creation in Seventeenth-Century Thought* (Grand Rapids: Eerdmans, 1977) 133.

[19] Boyle, *Works* 5.420–439.

> nature, the more humbly he acknowledged her Maker. Here was a piece of workmanship without flaw, rich in its intricate detail beyond the imagination of man. Truly nature proclaims the glory of God. Boyle never lost the sense of wonder that his first apprehension of natural glory awoke. . . . The creation speaks of an intelligent and powerful Creator. His imprint is heavy upon it.[20]

Boyle reaped an unfailing harvest of piety from his scientific investigations. Boyle was especially fond of certain psalms that expressed his personal doxological response to his observation of the physical world:

> And first, how boundless a power, or rather what an almightiness is eminently displayed in God's making out of nothing all things, and without materials or instruments constructing this immense fabrick of the world, whose vastness is such, that even what may be proved of it, can scarcely be conceived. . . . How manifold are thy works, O Lord; in wisdom hast thou made them all. And therefore I shall content myself to observe in general, that, as highly as some naturalists are pleased to value their own knowledge, it can at best attain but to understand and applaud, not emulate the productions of God.[21]

> I must needs acknowledge *Lindamor*, that when with bold telescopes I survey the old and newly discovered stars and planets, that adorn the upper region of the world; and when with excellent microscopes I discern, in otherwise invisible objects, the inimitable subtlety of nature's curious workmanship; and when, in a word, by the help of anatomical knaves, and the light of chymical furnaces, I study the book of nature, and consult the glosses *of Aristotle, Epicurus, Paracelsus, Harvey, Helmont*, and other learned expositors of that instructive volume: I find myself oftentimes reduced to explain with the Psalmist, *How manifold are Thy works, O Lord! in wisdom hast Thou made them all!* (Ps. 104:24).[22]

His scientific observations regularly include comments that prove that theological reflection in his science was a motivating force. Nature, for Boyle, represented an endless reservoir of curiosities and wonders that led him to praise God and tirelessly pursue knowledge of the world God had created. It is this sense of wonder at creation, tempered by a humble submission to the Creator, that distinguishes Boyle's science from his modern counterparts. Twentieth-century scientists overwhelmingly resist the intrusion of religious discussion in any form, claiming that it ultimately discourages scientific investigation by appeal to religious explanations. The god-of-the-gaps criticism is a classic example of this. Westfall notes:

> The virtuoso will check the proofs of Christianity more thoroughly than the ordinary man; since Christianity is true, the virtuoso's acceptance will be more sure than the ordinary man's. . . . The farther he penetrated into nature, the more splendid were the things that he discovered. Atheism or skepticism were impossible to his mind, for each fresh observation awoke more profound reverence for the Creator.[23]

[20] Westfall, *Science* 41.
[21] Boyle, *Works* 1.433–434.
[22] Ibid. 1.167.
[23] Westfall, *Science* 44.

Seeking to support theology through science led, however, to a subtle change in the way these realms were to be related philosophically, as noted by Gerald Cragg:

> In other and more subtle ways, the changing outlook affected the approach to religious problems. Science strengthened the tendency to give reason an ever larger role in theological discussion. Though the leading scientists believed that they were scrupulously loyal to traditional beliefs, they slightly modified the discussion of subjects of miracles and scripture, and these changes paved the way for the drastic revisions which the Deists demanded. The scientists also refused to argue from presuppositions; they insisted that we must first begin with evidence.[24]

4. *Boyle's view of nature*. Boyle joined other seventeenth-century scientists in the quest to refute the Aristotelian view that nature itself was divine. He favored the mechanical philosophy of explaining natural phenomena, seeing the distinction between Creator and creation to be clear in Scripture: "I call the creatures I admire in the visible world, the works of God, (not of nature) and praise rather Him than her, for the wisdom and goodness displayed in them."[25] Boyle refused to describe nature as divine or as separate from God. Rather, he depicted it as a system of predictable rules providentially controlled by God.

The specifics of Boyle's view of causation have been an issue of some debate. Scholars have traditionally interpreted the mechanical philosophy of nature in Boyle and other seventeenth-century thinkers as a self-contained, self-regulating, law-governed system, much like a machine. In this interpretation God is clearly the First Cause, but the issue of secondary causes is not made clear. During the last thirty years writers like J. E. McGuire[26] and Timothy Shanahan[27] have presented helpful discussions of Boyle's views

[24] G. R. Cragg, *The Church and the Age of Reason, 1648–1789* (Grand Rapids: Eerdmans, 1960) 74.

[25] Boyle, *Works* 4.363, 369.

[26] J. E. McGuire, "Boyle's Conception of Nature," *Journal of the History of Ideas* 33 (October-December 1972) 523–542. McGuire challenges the traditional interpretation of what Boyle meant by a "mechanical" view of nature. In McGuire's view, Boyle and others of the period were influenced by a particular theological tradition (the Reformed theology of the Calvinists) that stressed the omnipotence of God's will. Accepting a nominalist ontology, they believed that nature contained nonrelated particulars that did not have the power to cause change in and of themselves. Hence there was no secondary causation. Physical laws are categories imposed on nature by the human mind to describe observed regularities. God's will was seen to be the only agent of causation in nature. Thus nature is totally dependent on God's providence. Providence is God's continual action in nature. McGuire's interpretation of God's providence sustaining all activity in nature helps one understand why Boyle was comfortable with the doctrine of miracles in the Bible. These did not mean violations of God's laws and hence violations of his character but were variant expressions of God's providence to accomplish particular plans and purposes.

[27] T. Shanahan, "God and Nature in the Thought of Robert Boyle," *Journal of the History of Philosophy* 26 (October 1988) 547–569. Shanahan challenges McGuire's conclusions about the absence of any secondary causes in Boyle's explanation of nature. In this view, Boyle and other seventeenth-century natural philosophers saw God's sustaining providence in nature as the maintaining of laws of motion that actually govern the mechanical interactions of matter. Thus natural bodies of nature do possess causal powers and influence other bodies (secondary causes). Shanahan does not deny that these powers of the laws of nature are only possible through the sustaining providence of God.

on this issue and in so doing have clarified what was meant by the mechanical view of nature.

Boyle's most widely known illustration of a mechanical nature is his now famous comparison to the Strasbourg clock, where he wrote that the world

> is like a rare clock, such as may be that at *Strasbourg*, where all things are so skillfully contrived, that the engine being once set a moving, all things proceed, according to the artificer's first design, and the motions of the little statues, that at such hours perform these or those things, do not require, like those of puppets, the peculiar interposing of the artificer, or any intelligent agent employed by him, but perform their functions upon particular occasions, by virtue of the general and primitive contrivance of the whole engine.[28]

While the clock metaphor used by the eighteenth-century deists is sometimes traced to Boyle, it was entirely different. Boyle, unlike the deists, did not teach God's transcendence to the exclusion of his immanence. He believed both could simultaneously be true. He did not deny the miracles in the Bible, for example, but believed they represented God's action of suspending the norm for his own purposes.

5. *Laws of nature and moral laws.* Boyle's emphasis on the predictable, mechanical qualities of nature was also often expressed in his writings by using the metaphor of law. Boyle believed not only in physical laws but also in moral laws: rules governing actions that were required by the Creator. Noticeably absent from this discussion of Christian virtue was any reference to redemption and the enabling work of Christ. Boyle saw moral decisions as intellectual choices depending on one's relationship with God:

> Morality in Boyle's conception is not infused with saving grace; it is the morality of natural religion, obedience to the Lord Who gave laws to all of His creation. Thus his idea of morality brought him back to the conception of Almighty God toward which his religion pointed from every angle. Boyle worshipped a Being shorn of the redemptive mercy distinctive of Christian theology. In the hands of men who were less devout his religious expressions could readily have been turned into deism.[29]

6. *Boyle's view of revelation: nature and Scripture.* Following Bacon's lead, Boyle viewed nature and Scripture as complementary forms of God's revelation, claiming God's attributes could be known through "the contemplation of His works, and the study of His word."[30] Although he saw nature as a source of empirical knowledge along with the Bible, he did not think that man could attain complete knowledge of God through nature. Westfall explains this subtle but important difference from Bacon's view of the two books:

> Contemplation of the Almighty's excellency as displayed in His works was easily the dominant theme of Boyle's voluminous writings, but he made it perfectly clear that he did not consider the demonstrations of natural religion

[28] Boyle, *Works* 4.362.
[29] Westfall, *Science* 127.
[30] Boyle, *Works* 5.131.

> as the summit of religious truth. Natural theology may achieve a considerable knowledge of God, but there are limits which it cannot transcend. Since God knows Himself infinitely better than human beings can, we must go to His word to augment the lessons of natural theology. Boyle likened the Bible's place in religion to the telescope's use in astronomy. Although we can survey the heavens with the naked eye, a telescope makes everything more clear and reveals much that cannot be seen without it. He thought that natural religion, limited though it is, is nevertheless an excellent introduction to Christianity. . . . Thus natural religion will lead a man to the threshold of Christianity and prepare him to consider the evidence of the Scriptural revelation.[31]

Boyle therefore took very seriously the study of the Scriptures. He learned the original languages of Greek, Hebrew and Aramaic in order to more effectively study them. His greatest struggle as a scientist was the acceptance of Biblical miracles as recorded in the text. Again, his allegiance to the Bible as the ultimate authority is evident. Boyle saw incontrovertible evidence from Scripture that miracles happened. Believing God to be an omnipotent God, he concluded that they are not impossible. He appealed strongly to the wisdom in God's perfect creation, however, to assert that the miraculous violations of a natural order would have to be rare. Boyle concluded that the only occasion that would lead God to a violation of his own laws was the historical establishment and proof of Christianity. He believed that miracles ceased following the Biblical period.

7. *Contributions and cautions.* One cannot say enough about the humble spirit and important contributions of Boyle's science. He considered Bacon's successful program of rescuing science from medieval theology and natural philosophy a respected field. Boyle was more balanced than his predecessors in the integration of theology and science. More than any other virtuoso he experienced and wrote about the wonder of creation, humbly admitting as a scientist the limitations of human discovery when exploring the depths of an infinite Creator. He continually strove to show how the physical world manifests the glory of God and believed that this was one of its most important purposes.

Boyle was an extremely theological scientist and did not have serious weaknesses in his theology, as did his successor Isaac Newton. He continued to plant seeds, however, that bore fruit in the generation to follow him. The strong emphasis on rationalism that Boyle promoted, which was later reinforced by European rationalism and skepticism, ultimately placed science in judgment over the truth of Scripture. Though Boyle did not negate Biblical authority, the science he promoted ultimately led others to do so.

Boyle, like Bacon, saw the Christian experience as man's commitment to God's moral law. Although he did not write much in this area, he did not seem to embrace the orthodox doctrines of sin and salvation. Appealing rather to the more rational system of God's laws and moral duty, he believed it possible for any man, if he chose, to live a Christian life.

[31] Westfall, *Science* 124, reflecting Boyle's ideas (*Works* 5.521–522).

## III. ISAAC NEWTON

Isaac Newton (1643–1727) followed the scientific leadership of Bacon and Boyle and brought the seventeenth-century scientific revolution to its climax. Their cumulative system of scientific thinking, which was grounded in the philosophical thought of Locke's natural religion, has since dominated western thought. Newton, who was born in England and attended Trinity College, Cambridge, was a mathematician and physicist. He was elected to a teaching fellowship at Trinity but ignored the established curriculum and pursued his own interests in mathematics and the sciences. Among his most notable accomplishments are the development of calculus in mathematics, the proof of the heterogeneity of light in optics, and in mechanics his three laws of motion, from which he derived the law of universal gravitation.

1. *The relationship of science to religion*. Greatly influenced by Bacon, Boyle and other scientists before him, Newton also saw natural philosophy as a tool to dominate and control nature. The main business of science was the deduction of causes from effects until one revealed the ultimate cause of creation. Bringing his own strengths to this endeavor, Newton combined the experimentation and empiricism of Bacon with mathematical theory. Like the other virtuosi he considered the study of science as a means of revealing truth about God and hence approached it with religious fervor:

> This most beautiful system of the sun, planets, and comets could only proceed from the counsel and dominion of an intelligent and powerful Being. . . . He is eternal and infinite, omnipotent and omniscient; infinity to infinity; he governs all things, and knows all things that are or can be done. . . . We know him only by his most wise and excellent contrivances of things, and final causes; we admire him for his perfections; we reverence and adore him on account of his dominion; for we adore him as his servants; and a god without dominion, providence, and final causes, is nothing else but Fate and Nature. Blind metaphysical necessity, which is certainly the same always and everywhere, could produce no variety of things. All that diversity of natural things which we find suited to different times and places could arise from nothing but the ideas and will of a Being necessarily existing.[32]

Inherent in Newton's natural philosophy, however, was a theology that reached some compromises. Westfall notes:

> The relationship with Newton's own mind between his scientific work and his religious beliefs was a complex network of mutual influence. The traditional Christian persuasions which Newton was reared to accept, were neither wholly displaced nor wholly untouched, while his scientific theories were not unaffected by Christian doctrines. In fine, Newton, like the other virtuosi, effected a compromise between natural philosophy and the traditional Christian view of the world and of life. Although he went a step beyond the others in forcing Christianity into conformity with science, his compromise was still essentially the one accepted by all the virtuosi.[33]

[32] I. Newton, *Principia* (ed. F. Cajori; Berkeley: University of California, 1934) 544–546.
[33] Westfall, *Science* 194.

Newton's best-known writings show a piety that was common to writers before him, but in his private manuscripts we discover a confused theology in many areas. He devoted a great deal of time later in life to probing and questioning the rational basis for several important Christian doctrines, especially the doctrine of the Trinity.

2. *Newton's view of Christ, the Trinity, and pure religion.* When about 27 years old, Newton began to seriously study traditional teachings about the nature of Christ and the Godhead. After about five years of study he had become an Arian, denying that Jesus could have been fully God.[34] He believed that original and pure religion, which was the natural product of human reason, was love of God and love of neighbor. God had sent prophets like Noah, Moses and Christ to bring people back to pure rational religion. To Newton, therefore, Christ was a great prophet but was not divine in nature. This strong conviction in his theology was not known until his private papers were published in the twentieth century. Westfall notes:

> Newton's writings have the flavor of a man who reduced all religious questions to the intellectual or semantic plane. He repudiated the Trinity and the divinity of Christ because he thought that they were physically impossible. Physical possibility, however, is not the only consideration involved in the divinity of Christ; the sinfulness of man, his need for redemption, his ability to save himself without divine aid—these matters also bear upon the subject. A man's response to the spiritual experience behind religious doctrines will help to shape his formalized theology. Newton simply ignored the spiritual questions. Thus he wrote endlessly, defining the true religion, but never did he prostrate himself before his God.[35]

Skepticism about Christ's deity and the nature of the Trinity was evidence of an attitude that characterized later eighteenth-century deism—namely, the rejection of mystery in the universe or miracle in history. Newton, like the later deists, believed all of God's world can and must be rationally explained. To respond in wonder to claims of mystery revealed superstition and weakness.

3. *Newton's view of revelation: Scripture and nature.* Though Newton continued to use traditional Christian terminology in his writing, he often meant something very different. He spoke of the Bible as the revealed Word of God but evidently did not explain this revelation through a supernatural phenomenon. He believed the OT was the humanly recorded history of the Jewish nation, having a character no different than the records of the Egyptians, Phoenicians or Assyrians. Though Scripture came to man in some way from God, Newton believed its meaning was to be unlocked through human

[34] R. S. Westfall, "The Rise of Science and the Decline of Orthodox Christianity: A Study of Kepler, Descartes, and Newton," *God and Nature: Historical Essays on the Encounter between Christianity and Science* (ed. D. Lindberg and R. Numbers; Berkeley: University of California, 1986) 230.

[35] Westfall, *Science* 217.

reason only. He rejected the idea that the Bible could reveal truths about eternal life that were above human reason.

Following the thinking of Descartes, Kepler and Bacon, Newton viewed nature as much the revelation of God as the Bible is. He marveled at the amount of truth that was yet undiscovered in the universe. Just before his death Newton wrote to a family friend: "I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing on the seashore and diverting myself in now and then finding a smoother pebble or a prettier shell than the ordinary, whilst the great ocean of truth lay all undiscovered before me."[36] As for revelation, Newton held to the idea of design as an argument for the existence of God. Newton's tendency seemed to be an emphasis upon the immanence of God displayed through his maintenance of laws within his creation. Gravity, for example, was seen by Newton not as a power inherent in matter but as caused by the Creator acting constantly according to certain laws.[37]

4. *A turning point in scientific thinking.* Newton, more than other virtuosi before him, obscured the true relationship between science and religion by continuing to use Christian terms but with redefined meanings. Predecessors like Bacon and Boyle had strongly supported the truth that natural philosophy (science) was to be used in defense of Christianity and the study of its God. While Newton would have claimed to operate from the same perspective, he in fact privately redefined the Christianity he continued to publicly embrace. When subjected to rational analysis, he saw certain cardinal theological doctrines like the deity of Christ and the absolute authority of Scripture as an embarrassment to the new breed of scientist.

The rationalism that was the backbone of natural philosophy became the judge of traditional religion. When the Bible and its theological teaching were subjected to rational proofs, the parts that survived produced a very different Christian religion. Newton and other theists in his scientific tradition were undoubtedly seeking to remove from religion and Biblical teaching the elements that made scientists skeptical of religion and the Bible. But in so doing they introduced a new natural religion into scientific discussion that was devoid of the foundational beliefs of Christianity, especially the supernatural. The rationalism of this natural religion redefined Biblical authority, the spiritual needs of man, salvation, and ultimately even the God it claimed to reveal through science. God became merely a sustainer of the universal order he had created, and any further reference to his intrusion into history, as claimed by the Bible, became suspect. Certainly the rationalism herein described influenced fields other than that of science, but it was through the phenomenal growth and popularity of the scientific enterprise that rationalism gained its strongest grip on western society.

Though early natural philosophers approached their craft with religious sincerity, the philosophical moorings of science mitigated a redefinition of

[36] L. T. More, *Isaac Newton, a Biography* (New York: Scribner's, 1934) 664.
[37] Westfall, "Rise" 233.

the Christian religion and the meaning of faith in God. For the most part, this turning point in both science and religion was accomplished with little public debate. Through the personal theological convictions of influential scientists like Newton, a new and more secular religion was introduced. Those scientists who embraced it were theists, and many continued to call themselves Christians. The god behind their theism and the Christ in their Christianity had changed considerably, however, from the beliefs of their forefathers. Scientific rationalists also redefined the meaning of doctrines like salvation, sin and revelation in order to make them more palatable and less embarrassing to the logic of science. The deception for the common man came in the fact that traditional religious terms continued to be used but with new definitions. It should be noted that Newton himself rejected many aspects of what later became deism, as noted by Edward Davis:

> The typical picture of Isaac Newton as the paragon of Enlightenment deism, endorsing a remote divine clockmaker and the separation of science from religion, is badly mistaken. . . . His conception of the world reflects rather a deep commitment to the constant activity of the divine will.[38]

Eighteenth-century rationalism ultimately expressed itself religiously through the deists. Their theology regarded as ultimate authority the kind of rationalism that scientific thinking had espoused. This shift in authority had, however, come before the deists, as noted by Westfall in this evaluation of Newton:

> Little separated Newton's religion from the 18th century's religion of reason—only the name "Christianity" and an attitude which the name implied. The virtuosi had taken up natural religion originally in defense of Christianity, and this attitude still remained dominant in Newton. In removing the fragments of irrationality he was saving Christianity from itself and defending it from skepticism. . . . In defending Christianity in this manner, they prepared the ground for the deists of the Enlightenment—the mechanical universe run by immutable natural laws, the transcendent God removed and separated from His creation, the moral law which took the place of spiritual worship, the rational man unable to discover the true religion without the aid of special revelation. The religion of reason grew to maturity in the tradition that Newton completed, but the conviction that it was Christianity still remained. Newton did not look upon himself as a skeptic or an infidel. He thought that he had the real Christianity, safe at last behind its wall of rational demonstration. Unhappy thought! Change only the attitude, remove the reverence for Christianity that the virtuosi maintained, in a word move only from the religious 17th century into the doubting 18th, and deism, the religion of reason, steps full grown from the writings of the Christian virtuosi.[39]

Since the birth of modern science in the seventeenth century, the pursuit of a healthy relationship between theological and scientific convictions has

[38] E. B. Davis, "Newton's Rejection of the 'Newtonian World View': The Role of Divine Will in Newton's Natural Philosophy," *Science and Christian Belief* 3/1 (1991) 103.

[39] Westfall, *Science* 218–219.

led to diverse views on the issue. While the seventeenth-century natural philosophers assumed a cooperative and supportive relationship, most scientists in the nineteenth and twentieth centuries have treated science and theology as mutually exclusive or adversarial realms of truth. The present resurrection of interest in the design argument among theistic scientists calls for a clear understanding of its original use in modern science, including factors that led to its demise in Darwinism and neo-Darwinism. The thesis of this paper centers upon the evolving natural theology of the seventeenth century and the message it may have for moderns who seek to invoke the design argument in their science.

## IV. ELEMENTS IN THE SEVENTEENTH-CENTURY SCIENTIFIC VIEWPOINT THAT LED TO A SUPPORTIVE RELATIONSHIP BETWEEN CHRISTIANITY AND SCIENCE

1. *It challenged the prevailing contemporary view of nature, demonstrating that natural philosophy (science) strengthened, rather than destroyed, faith in God*. As shown earlier, the medieval view of nature discouraged scientific exploration by depicting it as Satan's realm and under his control. The virtuosi, in contrast, saw the physical universe as reflective of its Creator's glory, thus recognizing the apologetic value of science. Faced with the fear of a growing atheism, natural theology was presented as a supplement to Biblical theology, both providing a rational foundation against atheism.

2. *It promoted empirical thinking, and in so doing it also corrected the superstitious model of nature in medieval theology*. Early scientists like Bacon and Boyle did not deny or reject metaphysical truth but treated it as equally valid truth from a realm other than the physical. Their process was one of deducing causes and effects in the physical realm until one is led to the ultimate Cause: God the Creator. The study of science thus promoted empirical thinking, which helped to deliver society from many of the superstitious and irrational fears of the medieval period.

3. *Some scientists (such as Boyle) saw the religious duty of and doxological purpose in science*. Boyle believed a study of the physical world should not only support God's existence but also lead to a sense of wonder in the beholder. While always seeking deeper rational explanations, those who approached science with this humble spirit were willing to admit their limitations in finding objective proof for everything. The search for scientific truth thus became a spiritual exercise and religious experience for those who saw this purpose. From the wonders of nature they confirmed the religious teachings of the Bible and were unwilling to accept any contradiction between the two.

4. *It presented the mechanical conception of nature but avoided its portrayal as an impersonal machine*. The use of models like the clock metaphor tried to emphasize God's great wisdom through the predictable element

of law in creation. With few exceptions, scientists held to atomist and mechanical explanations of the make-up and behavior of matter. The English scientists of the seventeenth century focused more upon the "how" than the "why" questions and simply accepted as a given the benevolent order of God's providence. This commitment to God's involvement in nature and his attributes of wisdom and goodness counterbalanced the impersonal implications of a mechanical-universe model. This original balance was lost, however, through the influence of eighteenth-century deism and the weak natural theology of nineteenth-century British theologians.[40] Darwin's theory of a purely mechanical universe became the prevailing hypothesis.

## V. ELEMENTS IN THE SEVENTEENTH-CENTURY SCIENTIFIC VIEWPOINT THAT LED TO A CONFLICTING RELATIONSHIP BETWEEN CHRISTIANITY AND SCIENCE

1. *The natural theology produced from natural philosophy separated truth into two distinct categories: truth of religion, and truth of science.* Ultimately scientific truth, which was viewed as more objective, became authoritative over religious and Biblical truth. Early scientists like Bacon and Newton were committed to the advance and popularization of science. In order to separate their new field from the medieval theology of nature and superstitious practices like astrology and alchemy a clean break was needed. Bacon, who was more philosopher than scientist, popularized the two-book view of divine revelation, and this concept was followed by most early scientists.

Although these sources of revelation were initially viewed as equal, natural philosophers were more interested in the promotion of science than the preservation of accurate theology. In addition, the methodology of science seemed to be more objective and rational than the formulation of theological views. With the possible exception of Boyle, early scientists showed little interest in accurate, Biblical theology as a check on their natural theology. While some scientists were clerics, most were not trained theologians. Since prominent scientists were suspicious of the wide-ranging doctrinal views of the theologians, their natural theology became more authoritative than ecclesiastical interpretations of theology and the Bible.

2. *The natural theology produced from natural philosophy placed overwhelming emphasis upon rationalism, which led to doubt and denial of foundational Christian doctrines.* The Biblical claims of early scientists concentrated on the area in which natural theology could reveal truth, usually attributes of God the Creator. The concept of God emphasized, therefore, was one of a God who was omnipotent, wise and good and whose unchanging character revealed itself in the immutable laws of creation. The God of the atonement, with his attributes of holiness, love, grace and mercy, could not be seen in scientific observation and thus did not become an integral part of the natural theology proceeding from science.

[40] Hutchison, "Darwin's Evolutionary Theory."

Since the scientific revolution was based upon rationalism, the natural religion it produced began to challenge some key Christian doctrines that involved supernatural assumptions. The Trinity, the deity of Christ, the resurrection of Christ, and the veracity of miracles and predictive prophecy became suspect in rational scientific thinking. Miraculous events recorded in the Bible undermined the assumption of a completely mechanical universe, and the resulting conflict of authority ended with science as the victor.

3. *The natural theology produced from natural philosophy reinterpreted or ignored the physical and moral effects of man's fall to sin in Genesis 3.* The historical reasons natural philosophy avoided any consideration of a fallen world are quite clear. The virtuosi found it necessary to rehabilitate nature from the grips of medieval theology and to make it a legitimate area of study. This view of nature as completely under Satan's control necessitated a radical shift, and rationalist thinking provided the way. The concept of the fall was initially redefined by Bacon as affecting only the moral, not the physical, order. Biblical passages like Gen 3:17–19; 5:29 and Rom 8:20–22, which refer to effects of the fall on physical creation, were essentially ignored by Bacon and later scientists.

This avoidance of the concept of a fallen world, coupled with the rationalistic doctrine of God and law produced in natural theology, produced a natural religion in scientific circles contrary to the Biblical Christian message. This religion, essentially a reverence for deity and a desire to live morally, is described by Westfall:

> The Christian doctrine of salvation declined in their writings on natural religion to the analogy of an athletic contest. Eternal life was the trophy awarded to those who performed well, and the whole wide question of how a man can be righteous was left unanswered, was scarcely recognized. . . . The natural religion that they developed did not even acknowledge the fundamental problem with which Christianity had dealt in the past, the problem inherent in the anguished cry of the apostle, "O wretched man that I am! Who shall deliver me from the body of this death?" Natural religion was a response of the intellect to external facts. It was not immediately related to the concrete spiritual experience of the individual in a manner which made religion an integral part of his life as well as an intellectual creed. In reducing the significance of Christ, in stressing the transcendency of God, and in preaching uninspired obedience to an objective law, the natural religion of the virtuosi prepared the ground for deism.[41]

4. *The natural theology produced from natural philosophy redefined the Biblical doctrine of the providence of God.* The mechanical view of nature preserved a doctrine of providential control by God, but his providence was redefined as only a general benevolence toward his creation. The particular providence of God in providing for his creatures, and especially man, was ultimately lost in this natural theology. The emphasis shifted strongly toward a general benevolence of God as he sustained the physical order of the

[41] Westfall, *Science* 142.

universe, thus preparing the way for the detached God of eighteenth-century deism.

## VI. RELEVANCE OF THE USE OF THE DESIGN ARGUMENT IN CONTEMPORARY SCIENTIFIC DISCOURSE

In the introduction to a recently-published volume J. P. Moreland states:

> Ideas matter. In fact, what we believe and the way we see things largely determine the type of people we will become and the behavior we will exhibit. Because ideas matter, Christians and non-Christians alike should desire to know truth wherever it can be found. . . . The modern era has been called the era of science. Whether or not this is true, one thing seems clear—scientific ideas have had an impact on what people believe and how they see the world, as well as on the methods of investigation they think ought to be employed in our search for knowledge.[42]

The story of the seventeenth-century virtuosi chronicles the development of an important idea during the first century of modern science. The idea of God's design in creation was not original, but those who enthusiastically presented it believed it was essential to correct wrong thinking from the past. The fathers of modern science delighted in presenting evidence for the Creator through the scientific study of his creation because they believed that this was one of the great purposes of natural philosophy. In the following three centuries, however, their prodigy in the field of science has generally treated with contempt the idea of God's design. As demonstrated in the present paper, the later demise of the design argument is in part the result of a gradual deterioration of foundational, Biblical ideas in society. Bacon, Boyle and Newton would not have believed the final form their ideas would take in deism, Darwinism and neo-Darwinism. The changes were gradual but very significant and influential.

The growing influence of proponents of the design argument in scientific ranks is a great encouragement, especially since opponents have long claimed its demise. Like their seventeenth-century forefathers, modern Christian and theistic scientists have the opportunity to challenge prevailing incorrect views of the relationship between physical and metaphysical truth. With this opportunity comes the responsibility to proceed with care, combining state-of-the-art scientific investigation with a robust commitment to Biblical theology.

The historical observations included in this paper are intended to encourage modern virtuosi toward a careful integration of scientific and Biblical truth. One's view of the authority of Scripture and its relationship to the claims of science is perhaps the most influential personal conviction involved. One must recognize that scientific interpretation and methodology is not always completely objective. In spite of variations in some theological

[42] *The Creation Hypothesis: Scientific Evidence for an Intelligent Designer* (ed. J. P. Moreland; Downers Grove: InterVarsity, 1994) 11.

interpretations, one must cling to, as truth, the Biblical interpretations of historic, orthodox Christianity.

Theistic and Christian writers must therefore be wise in the claims they make. The greatest safeguard against excessive or inaccurate claims is a natural theology that is continually compared with Scriptural statements about natural revelation. Scientific practitioners, philosophers and historians who wish to make claims about God from their work must themselves become students of the Scriptures, continually testing their theories and maintaining an open dialogue with theologians and Biblical scholars. While Scripture supports the thesis that design in the physical world leads to knowledge of a Designer, history has shown that care must be taken when presenting this to those who doubt or deny it.

This careful integration of scientific claims with Biblical truth is also a protection against the natural religion that so easily evolved from science in the seventeenth century. Grounded in rationalism, the Christian message became a message of moral duty rather than personal salvation. Perhaps the greatest illustrations are found in the absence of a Biblical doctrine of sin, the redefining of salvation, the denial of Christ's deity and of the Trinity, and the ultimate refusal to accept the miraculous in Scripture. In such areas the Christian scientist must recognize the limitations of a revelation through nature and point others to Biblical truth for the answers to these questions.

Finally, the example of Boyle's wonder at the creation is an excellent model for every God-fearing scientist and a reminder that "God is God and I am not!"[43] The enterprise of modern science has made astounding strides forward during the last four centuries, including its authoritative position in western thought for a hundred fifty years. It has not, however, provided answers to all of man's questions, especially those that are metaphysical in nature. The great sense of humility exemplified by Boyle is ever so important in modern discussions as well. Once again, Newton's words aptly describe the sentiment:

> I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing on the seashore and diverting myself in now and then finding a smoother pebble or a prettier shell than the ordinary, whilst the great ocean of truth lay all undiscovered before me.[44]

The virtuosi in general and Boyle in particular saw the great doxological and devotional purpose in science, leading ultimately to glorifying its Creator. When science is used for apologetic purposes, including the argument from divine design, it becomes most effective when the life of the scientist is deeply touched by his work. Persuasion toward belief in God may use the intellectual argument from design to point the way. But ultimately it relies on the message and the messenger bearing truth from God's Word.

[43] J. Sire, *Discipleship of the Mind* (Downers Grove: InterVarsity, 1990) 15.
[44] More, *Newton* 664.