

## CHAPTER 6

### THE NATIONAL RECEPTION OF *THE ORIGIN*, 1859-1861

Our traditional focus on Cambridge and Boston as the major centers of the early debate over *The Origin* has often pushed the initial response to Darwin in other parts of the nation to the periphery of serious study. D. Appleton evidently did an effective job of providing review copies for the leading journals, quarterlies, and newspapers. Between January 1860 and the end of 1861, when President Lincoln appointed General George B. McClellan to lead the Army of the Potomac, a respectable number of serious reviews of *The Origin* were published. While the American press did not churn out the avalanche of reviews of *The Origin* that flooded England, it nevertheless provided American readers with an accurate sample of the debates on the major scientific, philosophical, and theological issues Darwin's theory posed.

We still lack a thorough survey of the American press response to Darwin that treats the early discussions as serious contributions to the debate on the issues Darwin raised.<sup>1</sup> Existing surveys are deficient in a number of ways. Much of the work on

<sup>1</sup>Alvar Ellegard's *Darwin and the General Reader: The Reception of Darwin's Theory of Evolution in the British Periodical Press, 1859-1872* (Chicago: University of Chicago Press, 1990 [1958]) is a model analysis. Edward Caudill's *Darwinism in the Press: The Evolution of an Idea* (Hillsdale, NJ: Lawrence Erlbaum Associates, 1989) is the only attempt to survey the American press response to Darwin. Unfortunately, it is littered with inaccuracies and filled with gaping holes in coverage.

*The Origin's* reception has been marred by the subsequent warfare of science vs. religion tradition that was solely concerned with lauding those wise persons who supported Darwin and lamenting those foolish persons who did not. This historiographical perspective showed little interest in the deeper philosophical, theological, or even scientific, issues that were raised in these reviews.<sup>2</sup> One could use

George Daniels has edited the best and most representative collection of early American reviews of the *Origin* in *Darwinism Comes to America* (Waltham, MA: Blaisdell Publishing Co., 1968). David L. Hull has edited the classic collection of British, along with two American, reviews in *Darwin and His Critics: The Reception of Darwin's Theory of Evolution by the Scientific Community* (Chicago: University of Chicago Press, 1973).

<sup>2</sup>Early studies of the American reception of Darwin's ideas concentrated on the theological reception and were shaped by the warfare of science versus theology framework popularized by John William Draper's *History of the Conflict between Religion and Science* (New York: D. Appleton, 1874) and William Dickson White's *A History of the Warfare of Science with Theology* (New York: D. Appleton, 1896). Bert J. Loewenberg's dissertation on "The Impact of the Doctrine of Evolution on American Thought, 1859-1900" (Harvard, 1934) set the stage and tone. His chapter titles tell the story: "The Odium Theologicum," "The Embattled Clergy," all ending, as expected, with "The Great Debate: Evolution Triumphant."

Loewenberg continued this theme in several articles spun out of his dissertation: "The Reaction of American Scientists to Darwinism," *American Historical Review* 38 (1933): 687-701; "The Controversy Over Evolution in New England, 1859-1873," *New England Quarterly* 8 (1935): 232-257; "Darwinism Comes to America, 1859-1900," *Mississippi Valley Historical Review* 28 (1940): 339-368. Several minor studies adopted the same warfare imagery: Sidney Rater, "Evolution and the Scientific Spirit in America," *Philosophy of Science* 3 (1936): 104-125 and William Edenstein, "The Early Reception of the Doctrine of Evolution in the United States," *Annals of Science* 4 (1939): 306-318.

Loewenberg led a host of followers. Windsor Hall Roberts traced the story of how five major Protestant denominations responded to Darwin in "The Reaction of the American Protestant Churches to the Darwinian Philosophy, 1860-1900" (Ph.D. diss., University of Chicago, 1936). Roberts could barely constrain his antipathy for the early theological critics of Darwin. He was greatly relieved to be able, finally, to tell the story of how the more mature theologians were able to reconstruct their theology in light of the truth of evolution. Samuel Register Neel, Jr., in his study of "The Reaction of Certain Exponents of American Religious Thought to Darwin's Theory of Evolution" (Ph.D. diss., Duke University, 1942) discussed how an eclectic group of five intellectuals eventually reconstructed their theology to accommodate the implications of evolution. John L. Morrison surveyed "A History of American Catholic Opinion on the Theory of Evolution, 1859-1950" (Ph.D. diss., University of Missouri, 1951).

The second phase of historical analysis, spurred by the centennial celebration of the *Origin's* publication in 1859, was marked by more sophisticated analysis, yet attention was still focused on the theological, rather than scientific, response to Darwin. Draper and White still loomed in the background. Edward Justin Pfeifer, "The Reception of Darwinism in the United States, 1859-1880," one of a handful of studies on the scientific response modified the earlier emphasis on overwhelming theological opposition and the triumph of Darwinism by showing how the first generation of scientists

a colorful snippet, the more outrageous the better, to characterize an entire review. This has been most effective in holding up Darwin's theological critics to ridicule. Other commentators have been woefully indifferent to chronology, historical context, and the types of periodicals in which reviews of *The Origin* appeared. Finally, in their desire to move to the post-Civil War debates, many historians have made, at best, passing reference to early reviews outside of Cambridge and Boston.<sup>3</sup>

very soon dropped Darwin's emphasis on natural selection as an essentially random process and replaced it with an essentially neo-Lamarckian emphasis on the heritability of acquired characteristics and, most importantly, the steady progressive nature of evolution. Pfeifer's emphasis has been amplified and confirmed by Peter F. Bowler's numerous studies. The best study of the theological response to come during this period was done by John Angus Campbell in "A Rhetorical Analysis of 'The Origin of Species' and of American Christianity's Response to Darwinism" (Ph.D. diss., University of Pittsburgh, 1968).

The Presbyterian response to Darwin has received the most attention and, in the earlier studies, often the most scorn. Daryl Freeman Johnson in "The Attitudes of the Princeton Theologians toward Darwinism and Evolution from 1859-1929" (Ph. D. diss., University of Iowa, 1968) and Dennis R. Davis in "Presbyterian Attitudes toward Science and the Coming of Darwinism in America, 1859 to 1929" (Ph. D. diss., University of Illinois, 1980) showed little insight or understanding of the Princeton response. Frank Joseph Smith surveyed "The Philosophy of Science in Late Nineteenth Century Southern Presbyterianism," (Ph.D. diss., City University of New York, 1992); Bradley John Gundlach has gone over much the same ground in "The Evolution Question at Princeton, 1845-1929" (Ph. D. diss., University of Rochester, 1995) and provides a more sensitive approach to the subtleties of the issues. Mark Noll and David Livingstone have considerably deepened our contextual understanding in *Charles Hodge: What Is Darwinism? and Other Writings on Science & Religion* (Grand Rapids, MI: Baker Book House, 1994). Gary Scott Smith's *The Seeds of Secularization: Calvinism, Culture, and Pluralism in America, 1870-1915* (Grand Rapids, MI: Eerdmans, 1985) stands out for locating the Presbyterian debate over evolution within its broader resistance to the secular direction of American culture across a broad front.

<sup>3</sup>Jon H. Roberts' *Darwinism and the Divine in America: Protestant Intellectuals and Organic Evolution, 1859-1900* (Madison, WI: University of Wisconsin Press, 1988) is the first modern published history of the American Protestant response to Darwinism. This exceptional study has several minor weaknesses that make it less useful for my present purpose. His thematic approach makes it difficult to sort out the very important chronological unfolding of the debate and the critical distinction between popular and scholarly religious press. The incredible array of sources upon which he draws, no doubt intended to insure a solid empirical foundation, has the unintended consequence of forcing him to rely on snippets from numerous individuals and sources rather than allowing the reader to follow the extended and often nuanced discussions that were the norm in the early years of debate.

Historians of science have now moved beyond the simplistic Whiggish search for those whose theories we now accept as "true" and are engaging in more penetrating analyses in which all of the participants in the debates are given the careful attention and respect they deserve. This salutary perspective enables us to discover new dimensions of complexity in the early debates on Darwin in America.<sup>4</sup>

One of the most surprising features of these early debates is that the theological quarterlies carried the bulk of the initial scholarly debate on the philosophical, scientific, and theological merits of *The Origin*. The *American Journal of Science* was the only scientific journal of substance at the time to review Darwin's work. The existing professional scientific associations, apart from those in Cambridge and Boston, did not discuss *The Origin* during the Civil War years. This cultural situation was in marked contrast to Great Britain which enjoyed a far richer supply of professional societies and journals. Professional scientific discussions had already migrated to these societies and journals before *The Origin* was published, so that there was a much sharper division of "science" and "theology" in British culture, societies,

<sup>4</sup>Ronald L. Numbers has opened up several ground-breaking perspectives on the American scientific reception in *Darwinism Comes to America* (Cambridge, MA: Harvard University Press, 1998) that bode well for the future. He uses prosopography to analyze how eighty members newly elected to the National Academy of Sciences between 1863 and 1900 responded to Darwinism. He discovered that there were comparatively more naturalists who opposed evolution than previously known, more naturalists who avoided the topic altogether, more naturalists who accepted evolution only because of the far more glaring weaknesses of creationism, and that the neo-Lamarckians remained a relatively small, isolated group throughout the period. He also found that southern attitudes were much less hostile to evolution prior to the Scopes Trial. All of these provocative themes will hopefully breathe some new life into the study of the American response to Darwin that has unfortunately taken a distant backseat to the much more vigorous study of the British response.

and journals.

Theologians, however, still played a central cultural role in antebellum America. The reviewers in the theological quarterlies saw themselves as the culture's intellectual leaders; many in mid-century still looked to them for this leadership. They were most often scholars trained in theology and philosophy who held faculty positions at denominationally-related colleges or pulpits in prominent churches. They were all abreast of British and continental intellectual trends. As was the Victorian custom, these scholars wrote lengthy essays on the books they reviewed. They would have scoffed at the modern notion that a book of any intellectual weight could be surveyed in a short notice. Their reviews, consequently, were short treatises of 20 to 30 pages that explored the intricacies of a book's argument. When these reviewers are allowed to speak more fully, they take us beyond the caricatures that have often hidden their arguments.

As we look more deeply we begin to see is that there was not a single uniform theological response to Darwin. There were different responses to Darwin within the same theological tradition, as in Old School Presbyterianism, as well as between theological traditions, such as between New Haven and New School Presbyterians. It is typically presumed that the most serious threat Darwin posed for theology was that his theory of natural selection undermined the design argument and attacked the credibility of the Genesis account; yet neither of these were mentioned in the early quarterly reviews. Few writers took their cues from Cambridge and Boston; neither Agassiz nor Gray seemed to have much, if any, influence on them. The weak

reviews of Lowell, Parsons, and Eliot made no impression and provided no model. All of the quarterly reviewers took Darwin's argument seriously, however much they believed he had failed to make a convincing case. The American quarterly reviewers are quite unique in this regard, given the contemptible treatment Darwin often received from the British quarterlies. In sum, there was more depth and nuance in the response of the theological quarterlies to Darwin than we have appreciated in the past.

The quarterly reviews of *The Origin* can best be read as contributions to a trans-Atlantic philosophical, theological, and scientific discussion of the appropriate criteria by which any scientific theory ought to be judged. The theological reviewers were working in differing, sometimes clashing, philosophical frameworks, from Scottish Common Sense Realism to Platonism, but they retained the traditional belief that philosophy was a crucial dimension of knowledge. Since they presumed that "science," particularly its philosophical and theological assumptions, fell within their purview as scholars, they believed they were obligated to review *The Origin*. The theological scholars reviewing Darwin were steeped in the rigors of logic and method; they assumed that all scholars, including Darwin and all scientists, shared the same assumptions and were accountable to the same logical criteria. We have already witnessed this emphasis in Francis Bowen's critique. Thus, they focused primarily on the logical structure of *The Origin*: did it meet the rigorous criteria of the inductive philosophy? When they criticized Darwin, it was largely for the logical lapses in his argument, not for his baleful influence on religious beliefs. That Darwin and the Positivist tradition had moved away from the quarterly reviewers' understanding of

theology, philosophy, science, and their inter-relationship, is a poignant chapter in this history. A close study of their rigorous logical scrutiny of *The Origin* can only deepen our understanding of this growing gulf between the theological scholars and the emerging Positivist tradition represented in Darwin.

The national press response to Darwin provides us with another context for understanding and evaluating Asa Gray's *apologia* for Darwin. Gray himself was keenly aware of the unfolding debate in England, both through the steady correspondence with Hooker and Darwin and the regular delivery of prominent English newspapers, periodicals, and professional journals to Harvard, the American Academy, and the Boston Society of Natural History. Gray also kept abreast of the debate among his American contemporaries. Clearly, then, when he wrote his reviews for the *American Journal of Science* in March 1860 and, more particularly, for the *Atlantic Monthly* in July, August, and October 1860, he was aware of the most significant criticisms that were being raised against *The Origin*.<sup>5</sup> He intended to shield Darwin from misunderstanding and to insure that the best possible case could be made out for his theory. Our survey of the contemporary national response to Darwin will enable us to better evaluate how well Gray assessed the major weaknesses that had to be addressed.

<sup>5</sup>We are not assuming that Gray read or was familiar with every review of *The Origin* prior to writing his essays. We are only interested in the kinds of arguments he believed had to be addressed to insure Darwin received a fair hearing.

### Popular Press Reviews of *The Origin*

The popular press, not surprisingly, was most likely to heap scorn and ridicule on abstruse scientific theories it did not understand and that flatly contradicted popular beliefs. Darwin, the serious scholar, never dreamed that many of the examples he included in his book to illustrate his theory could become easy targets of caricature. One of those examples that made its early way into the popular mind was the story about the cat and the clover. Darwin used this story to illustrate the interaction between seemingly remote organisms, like the cat and the clover, on the population of mice. The *Chicago Tribune*, picking through an overall commendable review of *The Origin* in the British periodical, *National Review*, found the reviewer's quotation of this story and his light-hearted comparison with the children's story, "The House that Jack Built." The *Tribune*, however, in quoting only the reviewer's comments, made Darwin sound like a fool.<sup>6</sup>

Two periodicals, *Eclectic Magazine* and *Littell's Living Age*, which regularly reprinted material from the British press, reprinted caricatures of *The Origin*. The *Eclectic* reprinted the anonymous review from the *British Quarterly Review* in which Bishop Samuel Wilberforce mercilessly mocked and denounced Darwin's views.<sup>7</sup> The following year *Littell's* reprinted from *Blackwood's Magazine* a new song on "The

<sup>6</sup>*Chicago Tribune*, 13 April 1860, 2. The anonymous reviewer in *National Review* was the well-respected English physiologist, William Carpenter. He was broadly sympathetic to Darwin's theory, something that never came through in the *Tribune's* blurb.

<sup>7</sup>"Darwin: The Origin of Species," *Eclectic Magazine* 50 (July 1860). Wilberforce's review appeared in *British Quarterly Review* 108 (July 1860), 225-264.



Origin of Species" which parodied Darwin's theory, along with three quotations from *The Origin* to document the basis of the parody and an excerpt from Erasmus Darwin's *The Temple of Nature*, no doubt to show family resemblance.<sup>8</sup>

*Harper's Monthly*, a magazine largely devoted to middle-class British literary tastes, gave a brief, fair, and succinct notice in its March 1860 issue. It announced that the book "abounds in important information, expressed in a style of admirable vigor and lucidity." Darwin, the reviewer reported, contended that species were but "strongly marked" varieties which were created, not by special acts of creation, but by "secondary laws," and provided "an ingenious and plausible explanation." His views, presented with "scientific modesty and candor" and "a striking array of facts," will "doubtless challenge discussion and criticism among observers with whom the philosophical study of natural history is a specialty."<sup>9</sup>

The religious newspapers also found it difficult to understand Darwin's theory and to take it seriously. The *New-York Observer*, the weekly newspaper of the Old School Presbyterians, called attention to Darwin's most "incredulous" speculation in March 1860.<sup>10</sup> Darwin had clearly failed to persuade this reviewer that he had offered any credible evidence to support his "bold" new theory. After all, the reviewer noted that Darwin had himself admitted that his theory would likely be rejected by virtually all of the respected paleontologists and geologists and was encumbered with

<sup>8</sup>"The Origin of Species," *Littell's Living Age* 69 (29 June 1861), 782-783.

<sup>9</sup>*Harper's New Monthly Magazine* 20 (Mar. 1860), 549.

<sup>10</sup>"Darwin's New Theory," *New-York Observer* 38 (29 Mar. 1860), 102.

"insuperable" difficulties. The reviewer was simply "staggered" by the flights of fancy found in the book. In fact, "all tales of fiction, all the grotesque inventions of oriental fancy, sink to lilliputian dimensions before the imaginary creations called into being by our author's theory." What else was one to make of bustards and ostriches springing from the same ancestor, bears transforming themselves into whales, swim bladders becoming lungs, and humans developing from some primordial form millions of generations ago? It simply strained belief. The reviewer would like to believe that Darwin was simply "bantering" with little serious intent on the "great mass of scientific theories" recently being discussed, but it was clear, much to the reviewer's chagrin, that Darwin intended to be taken seriously.

The reviewer found that Darwin's speculation about the ancestry of man was directly relevant to the debate on human origins then raging between the monogenists and the polygenists. If Darwin was correct about the unity of the human race, the Caucasians, warned the reviewer, must be careful in "spurning the Mongol or the Negro" since they may be denouncing a future great leader like "Bucephalus or even an Alexander." The Reviewer looked forward with both "amusement" and "grief" to the coming battle between Gliddon and Darwin on this point.<sup>11</sup>

The Dutch Reformed Church's weekly newspaper, the *Christian Intelligencer*, showed the hardest, most critical, edge toward Darwin's theory and the broadest

<sup>11</sup>George Gliddon, together with Josiah Nott, were prominent supporters of the polygenic view of human origins. Their latest book was *Indigenous Races of the Earth* (Philadelphia: J. B. Lippincott, 1857). Nott edited this volume which contained contributions by both Nott and Gliddon.

sympathy for Agassiz's views. It seemed to pay the most attention to Darwin's theory of any newspaper prior to the Civil War. We have already noticed its attention to Agassiz's lecture against Darwin in February. In March it published a most remarkable column. *The Origin of Species* was published while the debate over the polygenetic versus monogenetic origin of the human race was still alive. In this debate the menacing shadow of the black slave always hovered in the background. Agassiz was the most outspoken proponent of the polygenetic view and became the scientific darling of the Southern apologists. The *Intelligencer* found a way to fuse this debate with the possible implications of Darwin's theory of natural selection by reprinting a column on "The Reunion of the Races" from the *Springfield Republican*.

The author mused that Darwin's discussion of the "blending of different varieties of plants and animals to produce new forms, and the perpetuation of the best varieties on the principle of 'natural selection,' suggested some curious speculations as to the reunion and combination of the various races of men." Indeed, lamented the author, a similar tendency to blend the distinct races of mankind together had been occurring at an alarming rate throughout the world. The author bemoaned the fact that "in a century or two, the polyglot races now occupying the United States will be so thoroughly commingled that there will be few specimens left of any pure blood." This was most painfully true in the South where whites and Africans had so freely intermingled that the "pure African is hard to find." This "bleaching out of the African race" is not only "disgusting" but the "obliteration" of racial differences will create grave difficulties in distinguishing "the ruling and the servile classes." What

would be the result if the races were reunited, the author implored. Would mankind finally be restored to the original Man? Would there finally be an "ultimate and perfect race" that, through natural selection, had defeated all of the weak and inferior races and inherited only their finest characteristics? If so, what would become of the Anglo-Saxons? Time would only magnify the urgency of these questions, the author warned.<sup>12</sup>

By late summer the *Intelligencer* was pleased to report that Darwin's theory had been condemned almost unanimously by the eminent English scientists, Adam Sedgwick, William Clark, John Henslow, and John Phillips, and the American, Louis Agassiz.<sup>13</sup> "Prof. Agassiz has so brayed this theory in a mortar with a pestle, that its author will have some trouble to find its fragments." Darwin's theory, at first greeted with curiosity, had now met with "unqualified reprobation, as based on a most narrow induction, as grossly erroneous in its statement of facts, and as skeptical in its religious tendencies."<sup>14</sup>

<sup>12</sup>*Christian Intelligencer*, 30 (8 March 1860), 148.

<sup>13</sup>The columnist was apparently referring to the criticisms of Darwin which Adam Sedgwick, geology professor at Cambridge, and William Clark, anatomist at Cambridge, delivered at the Cambridge Philosophical Society meeting on 7 May 1860. John Phillips, professor of geology at Oxford, criticized Darwin in his Rede Lecture in May 1860. Henslow, a botanist and clergyman at Cambridge, actually defended Darwin against Sedgwick's more outrageous attacks at the Cambridge Philosophical Society meeting, for which Darwin was very grateful. He had been one of Darwin's favorite professors during his study at Cambridge; they remained good friends. Although he believed that Darwin had gone beyond what his evidence warranted, Henslow was warmly sympathetic. See Henslow to J. D. Hooker, 10 May 1860, CCD 8: 200-202 and Darwin to Henslow, 14 May 1860, CCD 8: 208-209.

<sup>14</sup>*Christian Intelligencer* 31 (2 Aug. 1860), 24, reprinted from *Episcopal Recorder*; 31 (20 Sept. 1860), 52.

The *Independent*, a Congregationalist weekly and the largest circulating northern newspaper of the period, squeezed in two reviews of *The Origin* in the midst of its dominant emphasis on antislavery efforts and the impending conflict with the South. In reviewing recent books bearing on "Genesis and Geology," the editor exuded confidence that the "harmony of Science and Revelation is established upon a basis so broad and permanent that no minor discrepancies of fact or interpretation can possibly disturb it."<sup>15</sup> All alleged disagreements were "only" apparent. The Mosaic Cosmogony held that "an intelligent personal God. . . brought the universe into existence" through "creative fiat." This fiat "took effect through a series of acts or epochs of creation, of which the appearance of man upon the stage of being, was the crowning end." From time to time an alternative theory of Development, through some "causative principle in nature," is revived, the reviewer noted, despite its being contradicted by the geological evidence for cataclysmic events and the subsequent degradation of species. Darwin, an "eminent Naturalist," has lately offered his support to the theory of development. Since Darwin had challenged the views of Agassiz, the reviewer expected a new round of discussions among scientists.

The reviewer was quick to point out that Darwin had only challenged a narrow "definition and classification of species." He had not considered the origin of existence. In fact, since Darwin "distinctly recognizes a Creator 'who has impressed

<sup>15</sup>This anonymous review, appearing on the editorial page, could most likely have been written by Leonard Bacon, one of the three editors at the time. Bacon eventually became professor of theology at Yale. He expressed the theology's department's official thanks to Gray for the set of lectures on "The Antagonisms of Scientific and Religious Thought" he gave at Yale in early 1880. Leonard Bacon to Asa Gray, 12 Feb. 1880, Gray Herbarium Archive.

laws on matter,' . . . his theory of 'the origin of species by natural selection,' is neither Atheistic nor Pantheistic, in his own way of presenting it." Theologians and scientists could study it with the care it deserved knowing that "truth fears no injury or discussion where candor rules."<sup>16</sup>

By July the reviewer, having read the July issue of the *American Journal of Science* containing the articles of Theophilus Parsons and Louis Agassiz, was prepared to give a fuller account of *The Origin* and its bearing on Christian belief.<sup>17</sup> After a brief, though fair, outline of the book's argument, the reviewer concluded that "to an unscientific reader this theory appears upon the face of it too far-fetched and fanciful to be warranted by scientific facts." Darwin had presented a scientific theory and must be judged by scientific criteria. When so judged, as Agassiz's extensive criticisms so clearly demonstrated, Darwin's facts were selected arbitrarily and unable to support the weight Darwin put on them. While quoting liberally from Agassiz's article, the reviewer highly recommended Dana's alternative understanding of species recently put forward.<sup>18</sup>

<sup>16</sup>After reviewing a pantheistic view of nature and a literalistic interpretation of Genesis, the reviewer was relieved to recommend *Archaia*, by J. W. Dawson, which provided a "scholarly" and "reverential" analysis of the harmony of geology and Genesis on the same principles as advanced by Arnold Guyot of Princeton and James Dana of Yale, two eminent Christian geologists.

<sup>17</sup>"The Origin of Species," 4. Appleton's apparently sent *The Independent* one of its first review copies; receipt of the book was noted in the 26 January 1860 issue, 3.

<sup>18</sup>The reviewer is undoubtedly referring, in particular, to Dana's address before the American Association for the Advancement of Science, "Thoughts on Species," in 1857. This address was subsequently reprinted in the *Amer. Jour. Sci.* 24 (Nov. 1857), 305-316 and *Bib. Sac.* 14 (Oct. 1857), 854-874.

The reviewer believed that Parsons' preference for Darwin's theory over the creation by the Almighty's immediate fiat underscored the tendency of Darwin's theory to substitute secondary causes working through aeons of time for the miraculous beginning of creation by a personal God. At the same time, the reviewer warned that since Darwin "occasionally recognizes a personal Creator, . . . it is neither wise nor just, therefore, to crowd into the ranks of Atheism those who would not voluntarily place themselves there, nor to concede to Atheism whatever strength there may be in their scientific facts and arguments." He went on to declare that "we see no cause of alarm for the Christian faith in the theory of the Darwin school, and if there were real cause of alarm, it could not be quieted by the cry of Atheism." The reviewer concluded by reminding his readers that "it is never worth while to be disturbed by scientific *theories* until these are well established by the widest possible induction and the most protracted scrutiny of the facts alleged in their support; and that when a theory of science is thus established by the general consent of scientific men, the only question between the theory and the Bible will not be one of fact, but one of verbal inspiration." He urged ministers to become familiar with scientific theories so that they could more intelligently judge their bearing on the Bible. Whatever the final verdict on Darwin's theory, the reviewer remained confident that "true Science and a true Faith will ever go hand in hand."

These popular press reactions to Darwin in America reveal a yawning gulf between the large mass of unsophisticated readers, which thrived on sensationalism, and the much smaller scholarly elite, which was intellectually prepared to assess

Darwin's theory. This should at least remind us that the genre of periodical and the audience to which it appealed made more difference in how Darwin's theory was received than did the theological convictions of the editors. But even here there was a wide divergence between the uncomprehending response of the *Chicago Tribune* and that of the *Independent*, the nation's largest newspaper, which discussed Darwin at a sophisticated level throughout the controversy.

### Reviews of *The Origin* by Scientists

The *New-York Times* was the exemplary exception to the tendencies we earlier noted in the popular press response to Darwin. It published two scholarly reviews of *The Origin* on its front pages in 1860. James Hall, the paleontologist attached to the New York State Geological Survey and collaborator with William B. Rogers in tracing New York's geology, wrote an articulate and praiseworthy review of *The Origin* in late March 1860.<sup>19</sup> Hall declared that Darwin had revolutionized the entire field of natural history with his striking doctrines on the origin of species. He had overturned with one blow the belief, held by renowned paleontologists and geologists, that species were permanence and independent creations, and penetrated the inner sanctum of that mystery of mysteries, the origin of species. It was not too much to say that Darwin had made "one of the most important contributions ever made to philosophic science."

<sup>19</sup>"The Origin of Species," *The New-York Times* (28 March 1860), 3. Darwin asked Gray to send him a copy of this "very striking" review. Darwin to Gray, 25 Apr. 1860, CCD 8: 166-167. The CCD editors suggest that, on the basis of internal evidence, Hall is the most reasonable choice as the author of this anonymous review. In the late 1850s Hall served also as state geologist for Iowa and Wisconsin.



His book compelled every scientist to reconsider his own theory on the origin of species in light of the "many consecutive and collateral lines of evidence" that Darwin brought forward to support his theory.

After a thorough and accurate summary of Darwin's "one long argument," Hall raised what he considered to be the most significant and "insurmountable" objection to Darwin's theory: the absence of transitional forms. Hall believed it was a most fair request to ask Darwin to produce some evidence of these forms; after all, the geological record was not as imperfect as Darwin suggested. The fact is, these transitional forms do not exist; fossils of the lowest Silurian strata were as distinct as the organisms now found on the ocean bottom. At the same time, he alerted his readers to the geologists' assumption that absence of the fossils in a particular deposit did not prove that life did not exist elsewhere during that epoch.

The second major deficiency Hall found was Darwin's evident lack of understanding in Transcendental anatomy. If Darwin would only have understood this grand "new spirit," which "became the light of all our sciences" at the beginning of the century, he would have come much closer to solving the riddle of the origin of species. "Of that lofty series of speculations embracing the doctrine of Homologies, Embryology and Unity of Type, he seems ignorant in any profound sense. It is only, we apprehend, by converging the prophetic omens and intuitions from these grand reaches of science that light can be thrown on the mysterious problem of the Origin of life." Geoffroy St. Hilaire, Lorenz Oken, Karl Gustav Carus, and Richard Owen have all "revealed a sublime unity of design and complication throughout the whole

hierarchy of animate organisms," from the lowly polyp to the majestic human.<sup>20</sup>

Despite these weaknesses, Hall declared that Darwin has illuminated the entire horizon of natural history. There was no question that his theory would lead scientists to study the "real genetic relationship of species" and extend the operation of a single mode of causation to the organic world. This "harmonizes better with our highest ideas of divine foresight, to believe that the scheme of evolution was originally made so perfect as to require no subsequent interference." He agreed with Baden Powell who saw the work of the Deity more clearly in "order, continuity, and progress" than in "confusion, interruption, and catastrophe."<sup>21</sup> Finally, it was not even Darwin's empirical evidence, as great as it was, that would be most significant. Hall believed that his most important contribution would be that it inspired "the whole of man's speculative activity" far beyond the limited range of facts. Hall was confident that the future would realize the full significance of the line of study Darwin inspired when "the sunlight of science" would illuminate those mysteries that had been shrouded in darkness for so many ages. Such was the glorious cosmic vision that the *Times* readers found in Hall's review of Darwin.

The only other scientists to review *The Origin* were two Canadian geologists,

<sup>20</sup>This remarkable statement further confirms the broad respect which the transcendentalist interpretation of natural history enjoyed among the older generation of naturalists in America, and how easily it could be re-interpreted to sympathize with Darwin's theories.

<sup>21</sup>Baden Powell, prominent Broad Churchmen and professor geometry at Oxford, had published *Essay on the Philosophy of Creation* (London, 1855) and *The Order of Nature Considered in Reference to the Claims of Revelation* (London, 1859).

John W. Dawson and Edward J. Chapman, in early 1860.<sup>22</sup> John W. Dawson, prominent geologist and principal of McGill University in Montreal, contended that, while Darwin had increased our understanding of the "mystery" of variation, Darwin had failed to support his major claim that varieties were but incipient species.<sup>23</sup>

Darwin's elaborate, though often instructive, analogy between the way that species were created in nature and the way that varieties were created in the barnyard failed to persuade for several reasons. All that Darwin has succeeded in showing was that some species, such as the rock-pigeon, were capable of wide variations in their non-essential characteristics. He had failed to find any generic differences among them that would warrant classifying them as distinct species. He could not even legitimately translate his experience with variations in pigeons into a law of variation for all species since we know that some species resist variation. Further, Dawson stressed that domestic breeders produced variations by subjecting species to abnormal conditions, something totally different from the conditions in nature. Animals "vary in consequence of these [abnormal conditions], sometimes suddenly, sometimes gradually, sometimes from premeditated treatment, sometimes unaccountably,

<sup>22</sup>Jerry N. Pittman provides a full bibliographical survey of the Canadian response to Darwin in "Darwinism and Evolution: Three Nova Scotia Religious Newspapers Respond, 1860-1900," *Acadiensis* 22 (Spring 1993): 40-60.

<sup>23</sup>J. W. Dawson, "Review of Darwin on the Origin of Species," 5 *The Canadian Naturalist and Geologist* (April 1860), 100-120. It is appropriate to include Dawson in our survey. He was an active member of both the British and the American Associations for the Advancement of Science, serving as president of each society later in his life. He and Asa Gray were friends; they debated the scientific merits and theological bearing of Darwin's theory throughout their professional lives. Dawson was especially well-regarded by American geologists and the broader theological community for his views on the harmony of Genesis and geology.

sometimes in directions useful to man, sometimes the reverse." Human selection consequently had only a limited role in producing variations. Creatures produced under these abnormal conditions were more akin to monstrosities than to new species.<sup>24</sup> Darwin, thus, had offered no solid empirical evidence to demonstrate that the same law which governed variation also governed speciation.<sup>25</sup>

<sup>24</sup>"Review of Darwin," 100-110.

<sup>25</sup>Dawson had just published *Archaia: or Studies of the Cosmogony and Natural History of the Hebrew Scriptures* (Montreal: B. Dawson & Son, 1860), which, despite its title, dealt with the entire range of issues in natural history that were even tangentially mentioned in the Bible. (*Archaia* is the Greek word for "origin," the word used by both Plato and Aristotle to discuss their respective cosmogonies.) The book was most definitely not another in the long list of harmonies of Genesis and geology, although he did, of course, discuss that important theme. One of the major themes he did discuss at some length was the meaning of "specie" and its relationship to "variety." This was a most urgent question in light of the lively debate on the question of whether the "races" of mankind shared a common origin and were thereby distinct varieties of one specie. Dawson came down unequivocally on the side of the "common descent" of the distinct races of humans.

Dawson was convinced that the laws governing variation and speciation were distinctly different. In a long Appendix on "Development of Specific Forms by Natural Development" Dawson presented extensive extracts from prominent geologists, all to the effect that geology unanimously disproved the possibility of the "gradual development of the higher forms from lower forms." (375) He concluded with the following pertinent cautionary note for Darwin, whom he knew through Lyell, was soon to pronounce in favor of the development theory. However valuable his contributions were sure to be, Dawson argued that

It is quite safe . . . to assert, that he can never succeed in proving that variation and specific unity are attributable to the same cause. The continuous reproductive power implanted *in* the species, and the changes impressed on it from *without*, are, like cohesion and heat in reference to the particles of matter -- opposite influences. The one may counteract or modify the other, but cannot take its place. It is easy to understand how variation, combined with geographical changes and local extinction, may so separate the members of a species as to simulate distinctness. It must be admitted from the analogy of God's operations, that the creative acts, whatever their nature, must, as well as variability, be regulated by some law; but the law of variation cannot possibly be identical with the law of specific origin and continuation which it modifies. . . . All that we know of variability points to the conclusion that it is subordinate to specific unity, though subject to the same vital laws. Specific origin it cannot reach, though it may imitate its effects, and present analogous phases of change, illustrative of the real laws of creation of species. It is to be hoped that Mr. Darwin will not neglect this distinction, and thus vitiate the great mass of facts which he has accumulated, by grouping them around an untenable hypothesis. (387)

Until Darwin could provide a credible law of speciation that was distinct from the law of variation,

Not surprisingly Darwin failed to persuade Dawson that Natural Selection could produce new species through a Malthusian struggle for existence. In point of fact this "fancied warfare in nature" did not apply to nature when considered as a complete system. "Vegetable life and the lower forms of animal life support the higher, and these supporting forms increase far more rapidly than those that subsist on them. . . . The beautiful harmony of nature provides that the feeders shall multiply more slowly than the food, and that the food shall be kept under control by the feeders." Naturalists know that when species multiplied faster than the available food supply, they experienced diminished fertility and that the sick, weak, and old were swiftly eliminated. If the struggle for existence showed us anything, Dawson observed, it was that it led to the degeneration, not improvement, of species. "In short, the struggle for existence is a myth, and its employment as a means of improvement, still more mythical."<sup>26</sup>

Dawson concluded that Darwin's unsustainable arguments had introduced far more mystery into the questions about variation and the origin of species than did the traditional explanation that traced them to the often inscrutable plan and purposes of

#### Dawson

would remain skeptical of Darwin's developmental theory. Darwin recognized this burden on his theory as well, a problem he did not solve in his lifetime. As Dawson's review of *The Origin* showed, he was not persuaded that Darwin's law of Natural Selection satisfied the criterion for distinct laws governing variation and speciation.

*Archæia* was warmly commended by its American reviewers who often reviewed it along with *The Origin*. See the reviews in *Amer. Jour. Sci.* 30 (Jan. 1860), 146; *The Independent* 12 (13 Apr. 1860), 4; and *Meth. Quar. Rev.* 42 (Apr. 1860), 339-342. It is, however, likely that most of Dawson's readers were not prepared to follow the more subtle arguments he made in this book.

<sup>26</sup>"Review of Darwin," 113.

an intelligent Creator. That such a Creator would create new species at separate times and locations on similar ideal plans seemed far more reasonable to Dawson than did Darwin's strained analogy with domestic breeding and the Malthusian struggle for existence. Embryological similarities, rudimentary organs, and the principles of classification were far better explained as various features of the Creator's plan. Darwin had gained nothing by reducing the origin of species to one primitive form. "That would be an equal mystery, more especially if it included within itself the germs of all the varied developments of animal and plant life." On the other hand, "if we are content to take species as direct products of a creative power, *without troubling ourselves with supposed secondary causes*, [italics mine] we may examine, free, of any trammeling hypothesis," all of the many fruitful scientific questions that Darwin addressed, from the laws of variation to the laws of geographical distribution. Dawson believed that such an approach would demonstrate that the origin of species lay beyond known natural law and that variations resulted from the complex interaction of natural characteristics and external conditions of life. He was confident that Darwin's failure to carry his case would finally lay the transmutation theory to rest.<sup>27</sup>

Edward J. Chapman, a mineralogist and geologist from Toronto, contended that, despite Darwin's "eloquent reasoning" and "unquestionable ability," he could not finally overcome the "insurmountable difficulties" he faced in defending views that

<sup>27</sup>"Review of Darwin," 117-120.

were remarkably similar to the *Vestiges*.<sup>28</sup> Chapman was perfectly well prepared to accept Darwin's reminder that naturalists lacked sufficient knowledge, faced many challenges, and experienced many failures, in their efforts to distinguish varieties, species, and genera. He was even prepared to follow Darwin in a limited discussion of the relationship between varieties and species. Darwin had, however, gone far beyond these reasonable limits to make unwarranted claims for the truth of his theory. For his theory to be accepted, Chapman maintained, Darwin would have "to show the passage of one truly distinct type into another, or of these into some common parent-type, so as to render an explanation of the structural homologies and other relations existing between them." He had failed to do that. His fascinating discussion of pigeons only demonstrated that they were highly variable. To argue more than this, as Darwin did, was to rely on "gratuitous surmises." Even giving natural selection more time to create new species would not help his cause. Darwin himself was well aware that the fossil record, his only other source of evidence, offered him no help. His effort to transform our ignorance of the geological record into support for his views provided weak support for his theory. Most importantly, Chapman pointed out, the geological record was not nearly as imperfect as Darwin portrayed it. Geologists have found two unmistakable facts in the most well-preserved strata: there is absolutely no evidence of any transitional forms, and at each level there is the simultaneous occurrence of allied forms that are distinct from earlier forms. The

<sup>28</sup>Edward J. Chapman, Review of *On the Origin of Species by means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, by Charles Darwin, in *Canadian Journal of Industry, Science and Art* 5 (1860), 367-387.

origin of species was as shrouded in mystery after Darwin as before.

Chapman perceptively noted that Darwin relied a good deal on exposing the difficulties of the traditional view that species were the direct product of the Creator's power and our current ignorance of the laws of natural history to support his theory. His strategy seemed to be to "uphold the development view, not by shewing the real strength of this, but by exposing the assumed weakness of the opposing system." But, admitting all of those weaknesses and the depth of our current ignorance does not offer any positive support for Darwin's theory. The facts in question, which every able naturalist acknowledged, still needed to be explained. They remain as inexplicable on Darwin's theory as by the traditional theory. At best, Chapman concluded, by bringing forward a flood of interesting facts Darwin had encouraged a wide and invigorating debate which would yield deeper understanding of these perplexing questions in the future.

The *New-York Times* was irked that neither the British nor the American Associations for the Advancement of Science had given serious attention to Darwin's theory at their recently concluded meetings. How could it be that these two esteemed associations of pre-eminent scientists from their respective nations could ignore the work of an honored scientist that had excited so much discussion around the world? It appeared that Bishop Wilberforce's denunciation of the theory had curbed all serious debate at the British meeting. The American Association was no less guilty for refusing to weigh the merits of this most important theory. Professors Agassiz and Gray, the two most articulate advocates on either side of the debate, were stone silent.



Their disappointing example was followed by others equally qualified to pass some judgment. The *Times* could understand how British scientists, beholden to the government for their positions, would be reticent to adopt a theory that threatened the state church, but American scientists had no such excuse. It appeared that these scientific societies were not "the agile, eager and enterprising vanguard of the scientific world," but rather the victims of "reluctant bigotry or paltry jealousy."<sup>29</sup>

<sup>29</sup>"The Advance of Science," *The New-York Times* (6 Aug. 1860), 4. The writer could have included all of the other American professional scientific societies that were silent on *The Origin* prior to the Civil War. The Academy of Natural Science of Philadelphia did, however, elect Darwin as a Correspondent of the Academy. Charles Darwin to Thomas Stewardson (Corresponding Secretary), 8 May 1860, CCD 8: 198.

Although by 1860 the British press had begun giving ample coverage to the annual BAAS meetings, there is only oblique mention of the infamous confrontation between Wilberforce and Huxley in the press. Ellegaard, *Darwin and the General Reader*, 62-69. It is this confrontation, thanks largely to Huxley's skillful remembering, that has dominated the historical memory. Since the American press depended on the British reports of the meetings, there is no surprise that it did not mention Wilberforce and Huxley. It also did not mention the lecture by John William Draper, chemistry professor from the University of New York, "On the Intellectual Development of Europe, Considered with Reference to the Views of Mr. Darwin and Others, that the Progression of Organisms is Determined by Law." It was this ponderous paper that drew an immense crowd and was the immediate occasion for the spontaneous outburst of Wilberforce and retort by Huxley. *The Independent* (12 [26 July 1860], 7), reporting on the same meeting, emphasized the excitement and overflow crowds that attended Dr. David Livingstone's paper on the discoveries of his recent trip to Africa.

For the *Athenaeum's* account of Oxford BAAS meetings see CCD 8, Appendix VI, "Report of the British Association Meeting in Oxford, 26 June - 3 July 1860," 590-597.

## Reviews in the Theological Quarterlies<sup>30</sup>

### Dutch Reformed Review

Taylor Lewis, a Classics professor at Union College well-known for his stout defense of Reformed orthodoxy, wrote a front page review of *The Origin* for the *New-York Times* in June 1860. It was at sharp right angles to the more pervasive Scottish natural theological perspective.<sup>31</sup> Lewis was a tireless exponent of Platonic idealism as the most appropriate philosophical framework in which to articulate Christian theology; this was the perspective from which he interpreted the meaning and implications of *The Origin*. Since Hall had already reviewed the scientific aspect of the book, Lewis focused on the glaring metaphysical weakness of all modern scientists, including Darwin, and how the Church should best respond.

Lewis had no doubt that the "book is atheistical," since "its first cause . . . is no God," except in the way of an abstract mathematical point of infinity. This did not surprise Lewis: after all, the entire tendency of modern science had been "drawing

<sup>30</sup>By grouping these reviews by theological traditions, I am not assuming that the reviewers in these respective quarterlies followed any sort of official position. I am merely suggesting that, because the quarterlies were conscious representatives of distinct theological convictions, they published reviews which were broadly consistent with their theological position. That there were differences among reviewers in the same quarterly underscores my point about the breadth of the respective traditions. This should discourage any stereotyping of a theological tradition on the basis of one review. Obviously, because the sample is so small, I can only suggest that a broader spectrum of views existed in each tradition than is usually assumed.

<sup>31</sup>"Recent Publications," *Supplement to The New-York Times* (2 June 1860), 1-2. The review is signed simply T. L. The structure and language of the review make it clear that this was written by Taylor Lewis. Showing the confluence of philosophical issues being debated throughout the English-speaking world at the time, Lewis reviewed *The Origin* along with James McCosh, *Intuitions of the Mind, Inductively Investigated* and Sir William Hamilton, *Lectures on Metaphysics and Logic*. Not surprisingly, Lewis saw significant parallels in the issues raised among the three. The only full-length study of Lewis is Franklin D. Steen, "Taylor Lewis on Scripture: A Defense of Revelation and Creation in Nineteenth Century America" (PhD diss., Westminster Theological Seminary, 1971).

more and more to some such theory of unbroken physical development" where the physical side of life swallowed up the spiritual side. It would finally conclude in "that sheer materialism which finds its completest exponent in a godless **HUMBOLDT**." This materialistic vision had "charmed" both the scientist and the "more ignorant science-worshipping vulgar."

If continuous development in the physical world is the unmistakable tendency of modern science, how then ought Christians respond? Lewis' answer no doubt surprised many of his readers, especially those in the Scottish tradition. In short, Christians must not do what they had been most prone to do: decry the materialist tendency of science and flee in panic from all physical explanations. Such a response "discredited" the faith by failing to maintain the essential distinction between the physical and the spiritual or metaphysical sides of life.

The truth is, Lewis explained at length, that Christians have absolutely nothing to fear from the doctrine of development, "since nothing in revelation forbids it." The Bible simply does not address this issue on either side.

There may be continuity in Nature, an unbroken continuity (we are somewhat inclined to think there is) and yet a supernatural, not making leaps or breaks, but from time to time dropping into the unbroken stream a new power, when and where it pleases it. It may have made all of Nature a coming out of the first nature, or with a few occasional aids to her deliverances over and above the original store of forces given her; or it may have made in this way all but man, or have made even man's *physical* proceed from the common womb, and yet along with this have given to him another element that lifts him into the spiritual or supernatural world, . . . a sharer in . . . the eternal, the

immutable, the uncreated being.<sup>32</sup>

If this were true, Christians simply had no reason to argue or worry about "how much God put into nature originally, or how much comes out of her, or how far it is the old force, or how far it is assisted, or whether it embraces all in nature below man's natural, or whether, in some of the ranks below, there may not be also more or less of supernatural intervention, opposing or concurrent, continuous or by leaps."

Let the physical continuity principle do its full work then; let it even develop mankind from the monkey, or even the fungus. Lewis had long argued, opposing both New Haven and Princeton, that, on purely philological grounds, the Genesis account gave wide latitude for interpreting man's creation by either a slow process of development from the tiniest germ or a sudden interposition of supernatural power. All that Scripture said is that humans, along with the entire creation, came from the earth. Lewis refused to speculate beyond this plain phenomenal language or to insist on a particular interpretation of this phrase. "Whether *out of the earth* means working *with* a nature or *through* a nature, the process is equally consistent with a Divine, and even a supernatural agency."<sup>33</sup>

<sup>32</sup>"Recent Publications," 2.

<sup>33</sup>It is one of the ironies of the debate over the implications of "development" for Christianity that James Dwight Dana, the Yale geologist, had several years earlier written a lengthy critical review of Lewis' books on *The Six Days of Creation* and *The Bible and Science* in which Lewis made out an eloquent defense for "development" in creation on a purely linguistic analysis of Genesis 1. Dana decried Lewis' openness to "development" as flirting with the infidel author of *Vestiges*. Lewis countered that Dana should, in effect, stick to his rocks, leave the difficult task of biblical hermeneutics and linguistics to himself, and be very careful whom he charges with infidelity. James Dwight Dana, "Science and the Bible," *Bibliotheca Sacra* 13 (Jan. 1856), 80-129, (July 1856), 631-656; 14 (Apr. 1857), 389-413, (July 1857), 461-524, and "Letter from Professor Lewis," *Bib. Sac.* 13 (Apr. 1856),

At the same time Lewis reminded his readers that "there are certain axioms that transcend all flowing physics" which "belong to the higher world of immutable truth." One of these basic principles is that "what is not in nature, no power or development can get out of nature." This is the fundamental reason why "Science [i.e. induction] can never successfully resist the development theory, because nature being a system of forces, quantities, motions, relations, patent and concealed, we can never be certain that any one thing in nature may not be in any other thing. . . ." All of the sciences in the early nineteenth century had discovered their own continuity principles.

Where the orthodox must hold the line, Lewis insisted, was to uphold the teaching of the Bible that man's uniqueness lies in his being created in the image of God. This image, man's divine nature, distinguishes him from all other creatures. Furthermore, this image was never originally in the creation; it was only subsequently introduced as God "breathed" into man his own spirit. Therefore, not even infinite development or continuity could bring it into existence. That is why Lewis did not fear that "development" would undermine human dignity; since it was bound strictly to the physical and material side of man, it was irrelevant in considering man's

471-476. Dana slowly came around toward the end of his life to accepting a form of "development" as being consistent with orthodoxy. He admitted to Arnold Guyot, professor of geology at Princeton, that he had come to accept Lewis's interpretation of the language of Genesis. Dana to Guyot, 30 Jan. 1875; quoted in Gilman, *The Life of James Dwight Dana*, 330-331.

Lewis nowhere specifically mentioned Augustine in his defense, but he was familiar with Augustine's interpretation of the generative potential of matter. See Augustine's *The Literal Meaning of Genesis*, trans. J. H. Taylor (New York: Newman, 1982), 2 vols. Christian disputants on all sides of the debate over "development" might also have profited from reading Augustine's *Confessions*, Book 12, in which he underscored how essential humility and charity were for the interpreters of the mysteries in Genesis 1.

spiritual side. Thus, Lewis declared, when we consider man, metaphysics, not physics, Scripture, not science, must be our guide.

The greatest challenge to the integrity of the Bible and orthodox theology, Lewis thus warned, came not from those scientists like Darwin who restricted their studies to the physical facts. No, the real challenge came from those philosophers who denied that man had "any ideas of the infinite, the absolute, the uncaused, the unconditioned, . . . any intuitions, any *a priori* truth, and Eternal knowledge." And who were these philosophers? The whole train of English empiricists who, following Locke, contended that the only things humans can know arise from their experience. Lewis aimed his sharp criticisms directly at the Scottish philosophy. William Hamilton, its most prominent leader, offered the ambiguous concept of the "unconditioned" that effectively denied man's ability to receive an authentic revelation from God.<sup>34</sup> Lewis concluded by advising Christians to "hold truly to the human supernatural, and then let naturalism take its way, and do its best with its dim eyes in exploring the origin of man's physical and material organization."

#### Old School Presbyterian Reviews

The *Princeton Review* did not publish any reviews of *The Origin* during this

<sup>34</sup>In the first part of his review Lewis traced the decay of orthodoxy to those Christian philosophers who, like Hamilton, met the charge that Christian belief was full of paradox, mystery, and contradiction with the claim that so, too, was philosophy. Christians and skeptics were alike in the epistemological darkness. Hamilton was simply following the broader tendency of Baconian science to dismiss "the deep mysteries of our being—those very *a priori* convictions on which faith rests, and to which revelation everywhere appeals." That is why Lewis found so much promise in McCosh's recovery of intuitions as a ground in man for God's revelation.

period. James Eckard, however, published an important article on "The Logical Relations of Religion and Natural Science."<sup>35</sup> This article made it clear that Eckard, and those for whom he spoke, did not have to wait for Darwin to hear the alarm bells ring about the dangers of infidelity lurking in the practice of science. The presumed harmony of science and religion had ended long before 1859, at least for Princeton. Christians could no longer rely on physical science to always subordinate its theories to the higher truth of the Bible and support orthodox beliefs. Many scientists, Eckard warned, had already employed their scientific investigations for "impious" ends, whether as a weapon in their outright mockery of God and religious truth or by simply ignoring Him in their theorizing. This was as true of the "grotesque atheism" of Oken as of the milder silence of Lyell. Christians, Eckard urged, must learn the truth about inductive philosophy, which he took to be synonymous with "science," and its proper relation with Christianity so that they could discern the "pernicious" errors and "infidel" tendencies of physical science. Eckard set out to equip the orthodox with such an understanding.

The heart of Eckard's essay was a critical review of the well-established principles of induction on which physical science rested and its fundamental belief in the uniformity of nature. He followed William Whewell, the prominent English philosopher and historian of science, in his understanding of these philosophical

<sup>35</sup>[James Eckard], "The Logical Relations of Religion and Natural Science," *Biblical Repertory and Princeton Review* 32 (Oct. 1860), 577-608. Bradley John Gundlach has identified Eckard as the author of this anonymous article, "The Evolution Question at Princeton, 1845-1929," (Ph.D. diss., University of Rochester, 1995).

issues. Eckard summarized six basic principles of induction: 1) before a theory could be declared as true, all of the relevant facts must be collected and understood in their proper relation to the subject in question; 2) since it is impossible to collect all of the relevant facts, except in the case of the mathematical sciences, we could not claim that our inductions based on those limited facts are certain, unless we could show a clear connection between the known and still unknown facts or that the limited range of facts we do have definitely excluded the truth of other possible theories based on the discovery of more facts; 3) while our studies will lead us to form hypotheses to explain the facts we have gathered,<sup>36</sup> we must insure that we allow the facts to modify our hypotheses, not twist the facts to conform to our hypotheses; 4) since a theory was always composed of true and false parts, we must be cautious when declaring that a theory is true simply because it leads to previously unknown truths; after all, even the Hindu's false astronomy enabled them to predict eclipses; 5) the probable truth of a theory is strengthened when several independent lines of argument confirm it;<sup>37</sup> although it is still possible for falsehoods to agree with each other; and 6) the degree of our confidence in our theories and hypotheses must be proportioned to the degree of our knowledge of all relevant facts; it may be the case that facts still unknown will cast serious doubt on the validity of our theories and hypotheses.<sup>38</sup> Eckard had given a fairly accurate summary of Whewell's philosophy of science.

<sup>36</sup>Whewell called this principle the "colligation of facts."

<sup>37</sup>Whewell's term for this important principle was the "consilience of induction."

<sup>38</sup>"Logical Relations," 581-583.



The implication Eckard wanted his audience to draw from these principles for dealing with the physical sciences was clear. Scientists who followed the inductive philosophy were unable to claim that their theories and hypotheses were certain since they could always be modified or even overturned by the discovery of more facts. Thus, those scientists who paraded their theories as unchallengeable truths, and declared that their theories overthrew Christian doctrines or elevated the physical sciences above the Bible, violated the clear principles of induction.

The inductive philosophy, Eckard contended, rested on the "great principle which underlies all physical theories and laws of nature . . . , that *the ordinary operation of nature is uniform* [his italics]." The critical philosophical question was: how was this principle justified? What was the basis for this fundamental belief? This was an especially pertinent question to answer in the face of challenges to established scientific and religious beliefs. "When science asks any class of learned men to surrender or modify their beliefs, she is bound to show that she stands on logical ground, as good, at least, as theirs." Had the supporters in the uniformity of nature met this test? Had they offered adequate grounds to support their belief?

Eckard surveyed each of the standard arguments brought forward to justify the belief in the uniformity of nature and he found them all wanting. Mill's claim that belief in the uniformity of nature was an induction based on our experience was logically indefensible. "Because an inappreciably small part [of nature] is uniform, we cannot logically conclude from this, that the inconceivably greater whole is the same" without begging the question or arguing in a circle. "Is there such a uniformity

in nature that we can be certain that the laws which govern the unknown are uniform and identical with those that govern what is known, so that we may reason from what we have seen to what we do not see?" Of course not. "This is the very point to be decided." Induction, Eckard concluded, assumed the uniformity of nature; therefore, contrary to Mill, induction could not be the foundation of the belief in uniformity without begging the question.<sup>39</sup>

Some philosophers, Eckard pointed out, agreed that belief in the uniformity of nature lacked logical proof. They maintained that belief in the uniformity of nature was, after all, self-evident; it was simply a matter of common sense. If this were true, Eckard wondered why belief in uniformity was not self-evident to the Greek philosophers. We search in vain for anything approaching this self-evident belief in Socrates, Plato, or Aristotle.<sup>40</sup>

The principle of the uniformity of nature had only seemed self-evident in those cultures which had known what the Bible revealed about God. "Let it be admitted that the universe is governed by a personal Deity, who has infinite wisdom, goodness, and power, and by one or two obvious logical steps we may deduce from this doctrine of the ordinary uniformity of nature; and the Bible wherever known, would irresistibly suggest this idea." Any exceptions to this general rule were attributed to the interpositions of God. Scripture, from beginning to end, portrayed the uniformity of nature rooted in God's providential faithfulness and order. No wonder that those

<sup>39</sup>"Logical Relations," 584-585.

<sup>40</sup>"Logical Relations," 585-587.

cultures touched by Christianity found the principle of uniformity to be self-evident. It appeared to Eckard, then, that "[t]he world of science . . . [was] indebted to the Church for that foundation axiom of induction which makes it possible for the philosopher to advance from the known to the unknown in nature."<sup>41</sup>

Having demonstrated that the uniformity of nature was rooted in the Bible's teaching about God's character, Eckard moved to a penetrating analysis, based largely on Whewell, of how that principle had been illogically used by physical scientists to support "anti-scriptural, if not atheistic" conclusions. "The keystone of the immense arch on which this temple of science rests is the principle that causes similar to those now in operation, and acting at their present rate, or substantially so, are to be regarded as having produced the former conditions of the earth." Eckard contended that once it was "admitted that natural causes never acted with more than their present energy and rapidity, and that none ever operated except such as are now in existence, and we may be forced to accept theories of the formation of our world utterly at variance with any fair interpretation of the Scriptures." It was, therefore, crucial for Eckard to challenge the validity of this philosophical claim.

He demonstrated that this "keystone" principle was, in fact, false on the basis of three philosophical objections: 1) its supporters have had a difficult time proving it or clearly and consistently stating its precise meaning; 2) there are scores of facts that dispute it; and 3) even its most prominent advocates have been compelled to desert it

<sup>41</sup>"Logical Relations," 587-588.

under pressure.<sup>42</sup>

First, the principle itself lacked proof. It was not self-evident; it lacked popular support in every culture; and no one had ever supposed that God had revealed it to them. That only left logical demonstration to support its validity. But no one, Eckard maintained, had ever supported this claim on the basis of well-supported inductions from observations or deductions from established premises. Lyell's entire system depended upon the claim that past changes in the geology of the earth resulted from causes currently operating at the same rate and intensity. But he failed to offer any proof, either inductive or deductive, for such a critical premise. When attacked for this failure he retreated in the latter editions of his *Principles of Geology* from his claim that the principle could be proven to the milder recommendation that it deserved "an earnest and patient *inquiry*."<sup>43</sup>

Not only does the principle lack proof but, Eckard pointed out, it could not even be stated in a meaningful way. Since physical scientists could not presume to state all of the relevant causes that were currently operating to change the earth, it was presumptuous to pretend they could know what forces were operating in past ages. Neither could they accurately gauge the current rate or intensity of the present causes. It was well known that there were some natural geological events, such as volcanoes, that varied a great deal in both intensity and rate in the present. When we add in the actions of other natural agencies, like wind and water, we compound our ignorance of

<sup>42</sup>"Logical Relations," 590-591.

<sup>43</sup>"Logical Relations," 591-592.

past and present rates and intensities. Even if the geologists retreated to the claim that they were talking only about the average rate for these changes, Eckard echoed Whewell who questioned how we could ever know that man had been on the earth long enough to know what the average rate was. It was clear to Eckard that the principle of uniformity, as stated by the most eminent geologists, failed the tests of logic and clarity.

Second, there were numerous facts that flatly contradicted the principle. It was well-known that certain physical events, like chemical reactions and combustion of gases, were more intense at the beginning of an event than at the end when the original energies were spent. If, as is generally agreed, the earth was formed largely by fire and chemical actions, it would appear reasonable to conclude, by analogy, that action was more intense at the beginning than at present when we are most likely at a period of stability. Furthermore, geologists required a very warm former climate and huge amounts of carbonic acid in the atmosphere to generate the luxurious plant life we now have. But, such high temperatures and large volume of carbonic acid would surely create events at a rate and intensity not now known. Even if that had not happened, it would still violate the principle of uniformity since these conditions would create unknown intensities in the present.<sup>44</sup>

Finally, Eckard illustrated how the strongest advocates of the principle of uniformity had abandoned it when confronted by cogent critics and undeniable facts.

<sup>44</sup>"Logical Relations," 592-593.

Critics had questioned where Hutton was going to get the intense heat he needed to support his igneous theory of the earth's formation. Neither the stars, sun, or even friction provided the necessary heat, according to his critics. Eckard quoted the early nineteenth-century geologist and critic of Hutton, Richard Kirwan, to the effect that by his inability to assign a cause for the fusion of minerals his theory required, Hutton had led us out of the domain of science and into the realm of conjecture. Lyell was, likewise, forced to concede that the law of gravity could not adequately explain how bodies were compressed in the interior of the earth. He even admitted that there was no way to scientifically disprove the possibility of former violent subterranean torrents since we simply do not know anything about their possible existence or operation. Eckard used his astute analysis of the failure of physical scientists to ground their belief in the uniformity of nature in anything other than the orthodox Deity to remind his audience "to be very cautious . . . to decide, or conjecture the causes or the rate of action, of remote and unseen natural operations."<sup>45</sup>

The apologetic conclusion was clear for Eckard. Christians must not cower in the face of the extravagant claims physical scientists made for their theories and their implications for Christian doctrine. The fundamental principle of uniformity upon which the geologists, and all other physical scientists relied, depended upon God's dominion over the creation; it could not be supported on any other foundation. It could, therefore, not be wrested from God and used to deny the possibility of His

<sup>45</sup>"Logical Relations," 593-595.

intervention or the possibility of unique causes acting in the past to shape the earth's features. With this understanding in mind, the orthodox could ferret out the "pernicious" atheistic tendency of physical science while still honoring the practice of science and those truths it uncovered. The great doctrines of the Faith still stood strong.

This article shows how Princeton perceived the threats posed by physical science and outlines its apologetic strategy in meeting them prior to confronting Darwin's challenge. The images of warfare permeated Eckard's article, in often swaggering and reckless metaphors. The battle had been joined with infidel science long before Darwin, notably in geology. The weapons Eckard chose for battle were the finely honed principles of induction which had been forged in the fires of an orthodox confession in a sovereign God, the same weapons now used by science to denounce belief in God. Eckard was supremely confident that these weapons, when wielded by the faithful, would overwhelm atheistic science; philosophical acuity, rather than dogmatic denunciations or tinkering with the particulars of science, was the key to withstanding science's threat. The successful result of this strategy insured that physical science, composed of tentative and uncertain theories, would be logically compelled to subordinate itself to orthodoxy, which was rooted in the certainties of Revelation.

There would be little doubt how Eckard would interpret and meet Darwin's challenge. His theory would be seen as yet another flanking maneuver of infidel science. It would be seen to raise no new philosophical issues since it was based on

the same philosophical mistake of faulty induction and refusal to acknowledge that God was the logical ground of the belief in the uniformity of nature. It could be met with the same strategy and weapons that he outlined in his article.

The range of contemporary philosophical and theological options available for dealing with the natural sciences within Old School Presbyterianism can be illuminated by contrasting the approaches of James Eckard, representing the northern wing, and James Woodrow, representing the southern wing.<sup>46</sup> James Woodrow is perhaps best known from Andrew Dickson White's portrayal of him as a martyr to the freedom of science to teach evolution in the reactionary seminaries of the South.<sup>47</sup> He merits deeper understanding. As one of the premier southern Presbyterian intellectuals in the late nineteenth century, Woodrow had already developed a sophisticated understanding of the relationship between theology and natural science by the time *The Origin* was published.<sup>48</sup>

<sup>46</sup>The southern wing of the Old School Presbyterian Church formalized its withdrawal from the northern wing in December 1861.

<sup>47</sup>Andrew Dickson White, *A History of the Warfare of Science with Theology in Christendom* (New York: D. Appleton and Co., 1896), 1: 316-318. Ronald L. Numbers has offered a dramatic redrawing of the conventional portrait of the South as the bastion of anti-evolutionary resistance in the late nineteenth century. His comprehensive survey, undertaken with Lester D. Stephen, found that "the South was far less uniform in its opposition to Darwinism than most scholarly accounts suggest. In fact, the very success of Darwinism in the South contributed significantly to the outburst of antievolutionism in the 1920s. . . . My survey of southern responses to evolution . . . shows that conventional wisdom about the controversies associated with Winchell, Woodrow, and Scopes give a highly distorted picture of southern attitudes toward evolution in the years from the early 1860s to the late 1920s." *Darwinism Comes to America*, 59.

<sup>48</sup>Robert K. Gustafson has written the only full-length study of Woodrow, "A Study of the Life of James Woodrow Emphasizing His Theological and Scientific Views as They Relate to the Evolution Controversy," (Ph.D. diss., Union Theological Seminary in Virginia, 1964). He has recently published a revision of his diss., *James Woodrow (1828-1907): Scientist, Theologian, Intellectual Leader* (Lewiston: E. Mellen Press, 1995). This title more accurately captures Woodrow's



Woodrow was appointed as the "Perkins Professor of Natural Science in Connexion with Revelation" at Columbia Seminary in November 1861, the first appointment of its kind at any seminary in North America, Britain, or Europe. Other seminaries soon followed Columbia's lead.<sup>49</sup> Woodrow was superbly qualified to

wide-ranging interests. He was an active Confederate, successful businessman, prolific editor of both *The Southern Presbyterian Review*, a quarterly, and *Southern Presbyterian*, a widely circulating weekly newspaper, respected Presbyterian minister and theologian, and president of the University of South Carolina. He had impeccable conservative theological, social, and political credentials. President Woodrow Wilson was his nephew and namesake. My references are to the diss.

Frank James Smith touches Woodrow's early life only tangentially, but provides a comprehensive overview of "The Philosophy of Science in Late Nineteenth Century Southern Presbyterianism," (Ph.D. diss., City University of New York, 1992). Smith gives a full account of the turbulent two years which began in 1884 with the Columbia Seminary board's request that Woodrow clarify his views on evolution and ended in 1886 with Woodrow's expulsion for teaching evolution, 298-394.

<sup>49</sup>The desire to establish this professorship was inspired by Edward Hitchcock, the well-known geologist and president of Amherst College. He had issued an eloquent call for such professorships in the introduction to his *Religion of Geology and its Connected Sciences* (Boston: Phillips, Sampson, and Co., 1851); it was reissued in expanded form in 1859. The anonymous author of "The Religion of Geology" was gratified that Hitchcock's call had been answered with the Perkins Chair and hoped that others would soon be established. "The Religion of Geology," *Bibliotheca Sacra* 17 (Oct. 1860), 676-677, n.1.

Perhaps Hitchcock's call may also have borne fruit at Princeton which created a new professorship of the harmony of science and religion for Charles Woodruff Shields in 1865. While serving as pastor of a Presbyterian Church in Philadelphia, Shields issued a short manifesto, entitled *Philosophia Ultima* (Philadelphia: J. B. Lippincott & Co., 1861), deploring the current fragmentation of knowledge between reason and revelation that was threatening Christian civilization. The fissures between these two grand realms of knowledge were being opened up, Shields warned, by the Extremists, Indifferentists, Impatient, Inept, and Despondent in both camps. Shields laid out a breath-taking comprehensive plan for the final reconciliation of these participants on the peaceful grounds of the "Ultimate Philosophy." John Maclean, president of Princeton College, was so impressed by Shields vision that he orchestrated a new chair for him in the philosophy, not theology, department. Unfortunately, as was the case at Columbia Seminary, Maclean envisioned a new chair in apologetics, a position Shields steadfastly refused to accept. Though he stayed on at Princeton, Shields was increasingly marginalized until he was, for all intents and purposes, replaced by Francis Patton, with whom he significantly disagreed on the "final" philosophy. Gundlach, "The Evolution Question at Princeton," 209-226. Shields completed his exhaustive survey of the unity of knowledge in a three volume work, *Philosophia Ultima; or Science of the Sciences* (New York: Charles Scribner's Sons, 1888-1905), shortly before he died. Shields refused to be boxed in by the prevailing apologetic and dogmatic theological options on the question of evolution throughout his life. His work bears remarkable similarity to that of the Dutch Reformed theologian, Abraham Kuyper who gave the Stone Lectures at Princeton in 1898.

assume this position. After studying chemistry for two years, 1854-1856, at the University of Heidelberg, he earned a Ph.D., the praise of his professors, and the honor of an invitation to stay on as a professor. The tug of home brought him back to Oglethorpe University where he had served as professor of natural science since 1853. During the summer of 1853 he had also studied with Louis Agassiz in Cambridge. While teaching at Oglethorpe Woodrow completed a theological course of studies to become ordained as a Presbyterian minister; he served four different churches during his years at Oglethorpe. His deep and abiding understanding of both natural science and theology enabled him to fill the newly created Perkins Chair at Columbia Seminary with insight.<sup>50</sup>

The Synodical decision to establish the Perkins professorship was rooted in the strong hope that the new professor would teach seminary students how to repel those "insidious attacks upon revealed religion" that had been coming from the natural sciences. Woodrow, however, was too much the scholar to accede to this restrictive and, from his perspective, self-defeating goal. He thus navigated through the dangerous shoals of staunchly conservative Presbyterian churchmen to articulate a broader, more modest, and nuanced purpose.<sup>51</sup>

He agreed that seminary students needed to understand the natural sciences in

<sup>50</sup>Gustafson, "James Woodrow," 11-24.

<sup>51</sup>James Woodrow, *An Address Delivered at the Inauguration of the Perkins Professor of Natural Science in Connexion with Revelation, before the Board of Directors of the Theological Seminary of the Synod of South Carolina and Georgia, at Marietta, Georgia, November 22, 1861* (Columbia, SC: Southern Guardian Steam-Power Press, 1862).

light of the Bible. But they needed this understanding because previous theological efforts to meet the challenge of unbelief were "too often . . . marred by ineptitudes and fanciful absurdities, whenever they touched the material works of God." Their scientific ignorance had actually done great harm to the Faith and had even promoted the skepticism they were designed to answer.<sup>52</sup> Defenders of the Bible, Woodrow counseled, must "guard against a dogmatic adherence to opinions which may not be well founded, and the denunciation as infidel of whatever differs from our own." The Church's sad performance in past controversies should have steered it away "from the groundless belief that the sacred volume . . . is . . . a text-book containing the whole body of scientific truth of every kind." Finally, Woodrow lamented, the Church's tendency to suffocate scientific inquiry into the scientific truth about God's world had earned it the just epithet of "*odium theologicum*." Woodrow astutely transformed Synod's warfare imagery into a lesson in theological and scientific pedagogy and humility.<sup>53</sup>

Woodrow made it clear that authentic scientific and theological inquiry rather than narrow apologetics characterized his understanding of his mandate. He would not be offering any of the standard courses in natural theology which rifled nature either for "evidences" of God's existence or for illustrations of the truths of revelation. Neither William Paley nor Bishop Butler would appear in his syllabi. He rather opted for the more modest, yet difficult, task of examining the foundations of

<sup>52</sup>"Inaugural Address," 4-5.

<sup>53</sup>"Inaugural Address," 24-27.

both science and biblical interpretation. Such an approach

would involve a careful study of the fundamental principles of the various branches of science from which the objections are drawn, and of their details, carried far enough to enable one to judge correctly of the amount of truth in each objection. It would involve, further, the careful study of the principles of biblical interpretation, as far as these relate to the mode in which the works of God are spoken of.<sup>54</sup>

Woodrow's students would have to understand the principles of genuine scientific investigation, the current state of scientific inquiry, and the fundamentals and difficulties of biblical hermeneutics before they would be able to answer the "infidel attacks." In the end, following a scholarly method and adopting a humble spirit of inquiry into the connection between natural science and revelation were far more crucial for Woodrow than any desired apologetic results.

Woodrow was persuaded that rigorous study of the foundations and genuine results of the various sciences and the principles of biblical hermeneutics would dissolve the vast majority of alleged conflicts. Such study would reveal

the imperfect character of science; the doubt which must hang around many of our interpretations of the Bible, on account of the brief, and therefore obscure, descriptions to be interpreted; and the probability that language may not be adequate to convey the ideas for which we may be looking, and which we may infer it is no part of the design of the Holy Spirit to present; we may expect to find many unadjusted differences, instead of perfectly established harmony.<sup>55</sup>

Synod simply could not expect him to find perfect harmony in the case of every alleged conflict when current scientific and biblical understanding lacked certainty and clarity in so many instances. He could at best offer his students various possible

<sup>54</sup>"Inaugural Address," 12.

<sup>55</sup>"Inaugural Address," 24.

interpretations for the "unadjusted differences" which were, in any case, at the periphery of the Bible's clear teachings. Most importantly, he would assure his students in all their inquiries that because the "Bible is the very word of God, and . . . every part is absolutely true, in the sense in which it was the design of its real Author, the Holy Spirit, that it should be understood," the findings of authentic science and accurate biblical understanding could never conflict.

There is no record of Woodrow's response to *The Origin* when it was first published. However, there are a number of significant clues to how he would respond to it in this inaugural address that mark out a distinctly different approach from that of Eckard. First of all, he contended that the Church had nothing to fear from accepting the evidence and arguments of legitimate scientific study, whatever momentary difficulties they may present. This did not mean a blanket acceptance of every scientific claim. When rigorously evaluated, some claims, like the antiquity of the earth, were beyond dispute; others, such as the claim for the plural origins of the human race, were obviously false; still others, like the extent of Noah's flood, were still doubtful. The scholar's first duty was to determine the strength of the scientific claims. Only then was he obligated to find its "connection" to revelation.

Woodrow would certainly press Darwin for the empirical foundations of his claims about the origin of species, not as an adversary, but as an exacting scientist.

Second, Woodrow dramatically narrowed the range of potential conflict between the natural sciences and the Bible in pointing out that

the natural sciences are based upon principles which it would be foreign to the

design of the Bible to teach, and upon material phenomena which it would be unreasonable to expect to find recorded there in scientific form; while, on the other hand, the incidental allusions, throughout the sacred volume, to natural objects, whose very incidental character it is that renders them unavailable to science as formal descriptions of phenomena, presuppose some knowledge of that to which reference is made, and make necessary the application of that knowledge, before the allusions can be understood.<sup>56</sup>

On the basis of these qualifications, Woodrow maintained that the record of creation was not written in "scientific form." It, therefore, could not conflict with any legitimate scientific claim Darwin may make about the origin of species.

Finally, from Woodrow's perspective the work of creation was absolutely unique; nothing in our experience could possibly be compared to it. Knowledge of [creation's] details can no more be communicated to us than a knowledge of the nature and properties of light can be communicated to the blind. But, however this may be, there is no difficulty in the way of imparting a knowledge of the fact of the creation, and of all its moral bearings, as far as they affect us."<sup>57</sup> The only way that Darwin's theory could presumably conflict with Genesis, from Woodrow's perspective, would be if it undermined the "fact" of God having created the universe and the "moral bearing" of that fact for humans. However the case would be determined, Woodrow would be scrupulously careful to avoid driving Darwin and his sympathizers into the arms of unbelief with "scornful contempt" for their theories.<sup>58</sup>

<sup>56</sup>"Inaugural Address," 21.

<sup>57</sup>"Inaugural Address," 23.

<sup>58</sup>"Inaugural Address," 26.

The Board accepted Woodrow's address without any questions, whether due to the demands of the war or the subtleties of his argument. The result was that Woodrow was able to teach this approach to many southern Presbyterian seminarians over the course of twenty-three years before his views on evolution were challenged by faculty colleagues who definitely did not adopt his understanding of the relationship between the natural sciences and revelation.<sup>59</sup> That his views on natural science and revelation were not challenged for twenty-three years was testimony to the influence he had on such a large number of seminarians.

#### New School Presbyterian Reviews

Daniel R. Goodwin, president of Trinity College in Hartford, Connecticut, and soon to be named provost at the University of Pennsylvania, argued at great length in the *American Theological Review* that Darwin's speculations about origins were philosophically and theologically bankrupt.<sup>60</sup> Darwin objected to the idea of the origin of life through the act of a personal intelligent Creator because such an act could

<sup>59</sup>Woodrow was very circumspect in his public pronouncements on the "connection" between the natural sciences and the Bible, although he was quite outspoken on a wide range of other issues confronting the Southern Presbyterian Church in the late nineteenth century. In an indirect response to Robert Dabney's assault on certain unscriptural geologists in "Geology and the Bible," *Southern Presbyterian Review* 14 (July 1861) Woodrow wrote "Geology and its Assailants," *South. Pres. Rev.* 15 (April 1863). Ten years later he felt compelled to answer Dabney's attack on atheistic science in "An Examination of Certain Recent Assaults on Physical Science," *South. Pres. Rev.* 24 (July 1873) and "A Further Examination of Certain Recent Assaults on Physical Science," *South. Pres. Rev.* 25 (April 1874). Ten years later the seminary Board asked him to clarify his views on evolution which he did in *Evolution* (Columbia, S.C.: Presbyterian Publishing House, 1884). This was the essay that Dabney and his supporters used to finally expel Woodrow from Columbia Seminary in 1886 after an ugly two-year struggle.

<sup>60</sup>"Darwin on the Origin of Species," 2 *American Theological Review* (May 1860), 326-343. The *Am. Theo. Rev.* was a joint New School Presbyterian and Congregationalist quarterly.

never be known inductively. But, Goodwin countered, no rational person ever believed that the original act of creation could ever be known in that way in the first place.<sup>61</sup> "The tracing of empirical laws step by step, however far and however nicely, can never bring us into the immediate sensible presence of the creative act." Every rational person, particularly those that followed Bacon's inductive methods, limited the empirical method to our normal human experience and historical knowledge; they never believed that the empirical method could be used to discover the original act of creation. Darwin knew very well, in quoting him at the head of his book, that Whewell "did not intend . . . to dispense with a creative cause; a cause which is not given in experience, but which theistic reason prescribes as a necessary condition for the possibility of experience; and that he would have unhesitatingly referred the origin of species . . . to the creative hand."<sup>62</sup>

The truth is, Goodwin charged, that Darwin's real aim was "to repudiate the idea of creation altogether." By doggedly pursuing the inductive method into the incomprehensible past Darwin, not surprisingly, arrived at dead, brute matter which, of course, showed "no sign of intelligence, no order, [or] arrangement of beauty." Now, either matter is eternal or it was created; there is no third alternative. Goodwin

<sup>61</sup>In so challenging Darwin Goodwin was really striking at the root of the design argument which had argued precisely this point. It had argued that the Creator was an inescapable conclusion of an *inductive* examination of the phenomena; the Designer could be discovered by infallible empirical observation. This is what Darwin objected to, though was not philosophically sophisticated enough to clearly distinguish the reality of the Creator from the often fallacious arguments used to arrive at the Creator's existence.

<sup>62</sup>"Darwin and the Origin of Species," 327.



maintained that "no empirical truth is more certain than the absolute dictum of reason, that there must have been a beginning to the course of material things; for an infinite series of phenomenal successions is a metaphysical absurdity." Darwin, though he may protest, had really chosen the *a priori* assumption that matter was eternal.<sup>63</sup>

This assumption, Goodwin underscored, was nothing else but the revival of the ancient Epicurean and Sophist nihilism dressed up in modern language. Darwin, along with the Epicureans, believed that the well-ordered world in which we live was merely the result of a "whirl of accident" having "no intention, no intelligent purpose, no rational choice." After all, grant Darwin the millions and millions of generations that his theory required and all things become possible. "When all impassable distinctions of *kind* are abolished, and only differences of *degree* remain, time enough will meet all exigencies and make any hypothesis credible." Changes taking place by "infinitesimal gradations" and imperceptible to the naked eye may, after all, happen over tens of millions of years. Such a belief rejects a special act of creation, Goodwin concluded.

Goodwin argued that his theory of natural selection did not help Darwin over the hurdle of needing an agent of creation. All that he had done was substitute the process of creation for an intelligent cause of creation. Natural selection was no true cause at all; it only described a mere process -- even granted that it was an accurate description, which Goodwin was not prepared to grant. "[B]ut the process cannot be

<sup>63</sup>"Darwin and the Origin of Species," 328-29.

rationally substituted for the plan, the design and the intelligence, so as entirely to dispense with them."<sup>64</sup>

Goodwin would not even grant Darwin the benefit of the doubt when he spoke of a Creator *breathing* into the primordial forms of animal and vegetable life. Goodwin claimed that this was, at best, only a weak metaphor that was inconsistent with his entire theory. "Surely it requires as great a stretch of credulity to believe that man has descended by natural generation . . . from the common prototype of all plants and animals, as to believe that such a common prototype, in its crude original form, developed itself somehow from an original eternal fire mist." If one is able to believe that "the mind of man, with all rational powers and moral perceptions and sensibilities, has been similarly developed from the common primordial type of carrots and toads, we see not why he may not believe or disbelieve anything. With such a faith it must be quite useless to reason. Such a faith becomes more than scientific in the breadth of its vision; it becomes prophetic."<sup>65</sup>

If, however, Darwin was willing to admit an original act of creation by an intelligent personal Creator, Goodwin readily granted that the Creator may have adopted the process of natural selection Darwin described.

If we admit the act of an intelligent Creator at all, that act may as well be, for aught we know or have a right to say, the creation of a compound which may afterwards be analyzed, as of simple elements which may afterwards be compounded; of a regular, orderly, complicated system at once, as of a chaos to be developed into such a system afterwards; of solid bodies in the very act of

<sup>64</sup>"Darwin and the Origin of Species," 333.

<sup>65</sup>"Darwin and the Origin of Species," 334-335.

motion according to definite laws, as of bodies at rest to be set in motion by a subsequent impulse, or as nebulosities to be gradually formed into spheres and systems; of thinking as of extended substance; of complex and definite organisms as of mere brute matter, or as of elementary particles with inherent laws.<sup>66</sup>

Goodwin concluded that only a personal intelligent Creator offered a sufficient explanation for the processes Darwin described. Once admit a Creator, Goodwin argued, and it is perfectly reasonable to assume that the Creator made the organisms by creative fiat, unless Darwin had the temerity to dictate what the Creator could and could not do.

Goodwin finally concluded that Darwin had failed to carry his "cardinal point," which was to erode the distinctions between species and varieties and species and genera. Naturalists commonly understood a species to consist of those individuals which were descended from common parents. He readily acknowledged the difficulty they often had in distinguishing between species and varieties, but attributed this to "the imperfection of our knowledge, not the falsity of our principle." Darwin had abandoned the accepted principle that inductive generalizations must be based on "the vast multitude of instances" rather than the rare exceptions. In short, Goodwin affirmed the objective reality of species and the mere logical convenience of genera and other higher classes on the basis of Darwin's lack of transitional forms, the overwhelming opinion of the naturalists, ancient belief, and the testimony of biblical revelation.<sup>67</sup> Darwin would do well, Goodwin counseled, to return to Bacon's

<sup>66</sup>"Darwin and the Origin of Species," 329.

<sup>67</sup>"Darwin and the Origin of Species," 335, 336, 339.

philosophic method and reverent spirit.

Chester Dewey, professor of chemistry and natural history at the University of Rochester, was persuaded that the current understanding of "species" enjoyed the overwhelming support of the most prominent naturalists, despite the challenges of the developmentalists, from Lamarck to Darwin.<sup>68</sup> While only implied, Dewey's main target was the polygenetic theory of the origin of the human race. By underscoring the consensus view on the meaning of "species" and then parading the evidence for the unity of the human "specie," Dewey clearly hoped to quash polygeneticism. "The general view of men is that a collection of individuals each possessing the same characters or properties, the same distinguishing qualities and powers, constitutes a species." Cuvier had added that "genetic descent," individuals descended from one another or common parents, was the only way naturalists could determine the boundaries between varieties and species. Linnaeus, Lamarck, and even Agassiz had adopted similar views.

Dewey noted that Prof. Dana's "Thoughts on Species" had "attracted much attention" since its publication. Dana argued more abstractly that "a species among living beings, as well as inorganic, is based on a specific amount or condition of concentrated force defined in the act or law of creation," which Dana understood as the way the will of the Creator produced it. This invisible and constantly acting

<sup>68</sup>Chester Dewey, "Natural History," *Am. Theo. Rev.* 2 (August 1860), 496-518. Dewey reviewed Cuvier's *Animal Kingdom*, Agassiz's *Essay on Classification*, Lyell's *Principles of Geology*, and Gray's *Botanical Text-Book*. The editors noted that they had excised Dewey's discussion of Darwin's *The Origin of Species* because Goodwin had provided an extensive review in the last (April) issue.

"concentrated force" was responsible for the complete development of each of the distinguishing characteristics of the individual germ-cell. But "why the germ-cell should exist and be developed at all, or with the character it has; and this character so varied and yet definite, that now the development is a plant, or an animal," could only "be referred to the creative will and fixed laws of the Almighty." Transmutation of species was thus impossible since the laws by which the Creator formed species were constant and fixed.<sup>69</sup> Humans were thus exemplars of the Creator's plan to create species that remained constant within certain variable boundaries.

#### New Haven Theology Reviews

The New Haven theology, with its scholarly center at Yale and its "benevolent empire" in New York, responded to Darwin in both the *New Englander* and *The Independent*.<sup>70</sup> The *New Englander*, the theological quarterly of the New Haven scholars at Yale, focused on Darwin's "most sweeping inference from analogy" that all animals and plants have descended from a single progenitor.<sup>71</sup> Darwin was persuaded, the reviewer noted, by the remarkable changes in form and habit of which

<sup>69</sup>Dewey, "Natural History," 508-513.

<sup>70</sup>The editorial boards of the *New Englander* and *The Independent* were closely interlocked. Leonard Bacon, who replaced Nathaniel Taylor at New Haven's First Congregational Church, edited *The New Englander*, the scholarly quarterly of Yale College, for over twenty years, beginning in 1843. He, along with Joseph Thompson, pastor of the prominent Broadway Tabernacle Church in New York, and Richard Storrs, edited *The Independent*, 1848-1861. Louise L. Stevenson, *Scholarly Means to Evangelical Ends: The New Haven Scholars and the Transformation of Higher Learning in America, 1830-1890* (Baltimore: The Johns Hopkins University Press, 1986), 25-26; *Dictionary of Christianity in America* (Downers Grove, IL: Inter-Varsity Press, 1990), s.v. "Bacon, Leonard, Sr.," 100-101.

<sup>71</sup>*New Englander* 18 (May 1860), 516-519.

domestic breeders were able to produce in animals, most spectacularly in the pigeon. This led him to reason that "what can be effected in the case of the pigeon, might be accomplished for every other species" under suitable conditions in nature "by the force of natural selection in the struggle for existence." So far so good. The reviewer then zeroed in on the critical missing factor that Darwin needed: "hundreds of millions of generations." Where was Darwin going to get this vast amount of time? Why, of course, from the long geological ages. But did the fossil record show any sign of these presumed intermediate varieties? No, said Darwin. Although the real plants and animals had perished without a trace, analogy with present plants and animals taught him that they nevertheless must have existed. This seemed ridiculously far-fetched to the reviewer. He did not challenge Darwin's facts; he had no doubt that it was "nature's design . . . to provide for many varieties . . . and that many of the so-considered species may have originated from an original pair. But there is a limit beyond which analogy, pliable as it is, will not carry us." What Darwin really needed was an adequate "metaphysical" framework within which to consider the basis of the analogy on which his theory was based.

The reviewer wondered "if Darwin's theory be true, by what processes and intervals of transitional gradation . . . was this faculty of interpreting past history of nature for millions of years . . . developed in Mr. Darwin, to its sublimest attainment of sagacity?"<sup>72</sup>

<sup>72</sup>This astute question was a poignant prophecy of one of Darwin's own dark worries late in his life. He wondered aloud to William Graham "whether the convictions of man's mind, which has been developed from the mind of the lower animals, are of any value or at all trustworthy. Would any

In early 1861 Joseph P. Thompson asked the question: "Does Science Tend to Materialism?" in his review of Louis Agassiz, *An Essay on Classification*, Charles Darwin, *The Origin of Species*, Baden Powell, "The Evidences of Christianity," and C. W. Goodwin, "The Mosaic Cosmogony."<sup>73</sup> It was sadly true that "irreligious" and "pretentious" science did tend toward Materialism. The bold and assertive spirit of a few men of science, such as Darwin, Powell, and Goodwin, had unfortunately overshadowed the humble and pious scientists, such as Agassiz, and given the erroneous impression that physical science itself was to blame for this tendency.

Thompson argued that science fostered Materialism when it transformed the physical laws it discovered through induction into actual causes of the phenomena subsumed under them. He understood how this could happen. "There is a fascination in reducing a wide range of physical phenomena to a simple law which defines and governs their relations." Who could not appreciate the thrill of Galileo or Newton in reducing motion to general laws? That was only natural. The danger was that since "we can trace many laws of exquisite precision, beauty, and simplicity, there is a strong temptation to regard these formal reasons for phenomena as the original causes

one trust in the convictions of a monkey's mind, if there are any convictions in such a mind?" Darwin to William Graham, 3 July 1881, *Life and Letters*, 1: 284.

<sup>73</sup>Joseph P. Thompson, "Does Science Tend to Materialism?" *New Englander* 19 (Jan. 1861), 84-101. The Powell and Goodwin articles were published in *Essays and Reviews*, the volume of essays by seven Broad Churchmen which stirred a sensational theological controversy when it was published in England in mid-1860. Frederic Hedge, a prominent Unitarian minister and Harvard Divinity School professor, edited an American edition entitled *Recent Inquiries in Theology*. An *Independent* editorial in November 1860 regretted that Hedge had allowed this "dangerous [book] to put into the hands of undisciplined youth." Apparently, the American reprint sold very well; it was already in its third edition by 1861.

of these phenomena" and stop short of discovering the true Cause of the phenomena. Several scientists are thus led to "conceive of the universe as a mere system of self-evolving laws."<sup>74</sup>

Thomson contended that Darwin had definitely succumbed to this temptation in his vision of the eternally cycling universe governed by the general laws of evolution at the end of his book. This was a picture of nothing less than "materialistic pantheism." This did not mean, Thompson cautioned, that "Darwin's theory of development through the evolution of organic laws" conflicted with Christian belief or that his theory, if verified, removed the necessity of an intelligent First Cause. It would be imprudent to declare that Darwin was an atheist. "But the fascination of the idea of progressive evolution by physical laws, leads Darwin to conceive of the Creator as filling some honorary office rather than as performing an efficient function in the universe."<sup>75</sup>

This materialistic tendency was further confirmed in the way Darwin "personifies the laws of nature as intelligent powers" in his theory of Natural Selection. Natural Selection assumed all of the creative power and superintendence previously ascribed exclusively to the Creator. Although Darwin spoke of a Creator, this was little more than "a complimentary allusion rather than a necessity of [his] logic." Darwin's Creator had more in common with "Emersonian Fate" or the "transcendent negation" of Hegel. "The personality of God vanishes before such a

<sup>74</sup>"Materialism," 85-86.

<sup>75</sup>"Materialism," 87-88.



personification of God."<sup>76</sup>

Thompson found that Darwin was not alone in the "deification of natural law." The author of an article in the *Westminster Review* waxed eloquent on how "the notion of evolution by law is transforming the whole field of our knowledge and opinion. It is not one order of conception which comes under its influence, but it is the whole sphere of our ideas, and with them the whole system of our action and conduct."<sup>77</sup> Baden Powell, as well, exulted that Darwin had established what had so long been denied and denounced, that species were originated by purely natural causes. Such an astounding achievement, Powell declared, "must soon bring about an entire revolution of opinion in favor of the grand principle of *the self-evolving powers of nature*." The tendency to attribute power to general physical laws was as clear to Thompson as it was contrary to sound induction and theology.<sup>78</sup>

Edward A. Walker, a Congregational pastor then serving as Union chaplain, followed up Thompson's analysis of the materialistic tendencies of science with a blistering critique of the way that "suicidal conservatives" and "reckless radicals" within the Church were currently seeking to defend the truths of Christianity.<sup>79</sup> These

<sup>76</sup>"Materialism," 88-89.

<sup>77</sup>Frederic Harrison, the prominent English positivist, was the anonymous author of "Neo-Christianity," a laudatory review of *Essays and Reviews*, published in the October 1860 issue of the *Westminster Review*, 293-332.

<sup>78</sup>"Materialism," 88-90.

<sup>79</sup>Edward A. Walker, "The Present Attitude of the Church Toward Critical and Scientific Inquiry," *New Englander* 19 (April 1861), 323-351. He reviewed Mansel's *The Limits of Religious Thought Examined and Recent Inquiries in Theology, by Eminent English Churchmen; being "Essays and Reviews."* He did not identify the "conservatives," but the "radicals" were those who shared the

polar tendencies were already evident in the early response to Darwin's *Origin*. "By damaging assumptions and suicidal concessions, the partisans of the Church have repeatedly jeopardized her interests, disputed her theology, and heaped upon her obloquy and shame." On the one hand, were the "narrow-minded and bigoted" conservatives who were hostile to "critical and scientific inquiry." These were the men who, assuming that the Bible was an infallible authority on astronomy, physics, history, and philosophy, had shamed the Church with their "intolerance, dissension, schism, and strife." Though a succession of erroneous scientific beliefs had driven them into retreat, they still continued to denounce science as heretical. They seem never to have learned that this strategy dishonored the truths of Christianity and encouraged the spread of open hostility to the Church. How many more embarrassing controversies between these "friends" of the Church and Science would the Church have to endure, Walker wondered.<sup>80</sup>

If the conservatives encouraged infidelity by their obtuse ignorance of science, the "reckless radicals" encouraged infidelity by their naive embrace of unwarranted scientific claims. These men, epitomized by Mansel and the authors of the *Essays*, in their zeal to disabuse the Church of venerable but false views about the Bible and Christian doctrine, frequently conceded debatable scientific points too quickly to the atheists and adopted scientific theories on the slimmest of evidence. The result was that there was often little to distinguish them from the open enemies of the Bible and spirit and strategy of Mansel and the authors of the *Essays*.

<sup>80</sup>"The Present Attitude," 322, 325, 337, 340, 345.

the Church. It had already happened that the views of Mansel and the *Essays* had been gleefully paraded by atheists as announcing the downfall of the Church.<sup>81</sup>

Those who exploit modern science to support their infidelity, Walker contended, always follow an unscientific method in their pronouncements. They eagerly marshal "an array of . . . half-truths, difficulties, and seeming discrepancies . . . in the area of physical science and biblical criticism against popular belief." This is exactly how Darwin's "old, exploded theory concerning the origin of species" is being used by the enemies of the Church. Darwin had failed to offer any positive evidence for the development of a single species from another, yet the infidels uncritically adopt it as a weapon against Christian belief. He was obviously a "careful observer and patient collector of facts," but his complete abandonment of the principles of inductive science "compromises entirely his character as a scientific man and a philosopher." Atheists and infidels fancy that Darwin had undermined the rational belief in God as the Creator of the universe. But this only showed their superficial understanding of Christianity. It was preposterous for them to think that "by removing the first cause to a greater distance, we thereby rid ourselves of the necessity for it! -- as if the existence of God were not just as necessary to account for the preservation of the world . . . as for its creation! It is impossible by a "mere jugglery of words" to replace God with "Nature" or "Law."

Walker could not contain his astonishment that Darwin's "unscientific theory,

<sup>81</sup>"The Present Attitude," 340, 344-345.

unsupported by facts, in the face of an overwhelming mass of opposing evidence; [was being] urged against the Christian faith in a manner utterly irrelevant, illogical, and contrary to common sense!" And yet these were the sophistries that were being hailed by modern infidelity and abhorred by panic stricken theologians. Walker found it beyond belief that a scholar, like Baden Powell, who prided himself on being a "liberal," could exempt Darwin's theory from the same critical scrutiny he applied to the traditional scientific and religious beliefs of the common people.<sup>82</sup>

Walker was quite willing to "admit the facts which science may bring forward, in whatever department of investigation, and to correct our opinions by them." He had no intention of twisting the facts of science to conform to discredited religious prejudices or of contorting the plain language of the Bible to make it harmonize with modern science. His method entailed "a study of the circumstances which under the several portions of the Bible were given to the world, the sources of the language employed, the understanding of the people addressed, and the purpose which the writer had in view, to show how such use of language there and then was justifiable, if not the best possible." If following this method meant that the Church would have

<sup>82</sup>"The Present Attitude," 344-346. In the July issue of the *New Englander*, after dismissing C. W. Goodwin's article on "The Mosaic Cosmogony" in *Essays and Reviews* as a scholarly embarrassment, Walker searched the maze of conflicting interpretations of "The First Document of Genesis" to find a coherent and consistent understanding that avoided the strain interpretations of the reconcilers, conservatives, and radicals. He commented that the "so-called 'development theory' . . . is merely a perverted and unscientific statement of the simple principle that, as the world has been made ready for successive new and higher forms of life, God has successively created them. State this theory in any way: it points to a beginning. Start with the lowest condition of the primordial elements of matter—conceive of the whole material universe, according to LaPlace's theory, existing as a nebulous mass; take aeon after aeon for the slow formation of systems, constellations and individual stars—the theory still points to a beginning and to a development in time." "The First Document of Genesis," *New Englander* 19 (July 1861), 585.

to abandon cherished beliefs that had been shown to be false, e.g. the Ptolemaic universe, Walker was prepared. The Church, after all, was established on a more solid foundation than could be provided or dislodged by natural science. It had absolutely nothing to fear from the pursuit of the truth. Only in following this strategy could the Church recover the harmonious relationship which had always existed with Science and defeat both the "heresy hunters" and the "radicals" in its midst.<sup>83</sup>

#### Wesleyan Reviews

The reviewer for the *Methodist Quarterly Review*<sup>84</sup> was impressed that *The Origin* had "been conducted in a philosophic spirit" and offered a theory that rested on "innumerable facts and plausible reasonings." It surely promised to "challenge discussion and even adoption in absence of refutation or a preferable competitor." After noting the endorsements his theory had already received from Charles Lyell, Joseph Hooker, the *Westminster Review*, and the *National Review*,<sup>85</sup> the reviewer offered four general observations on Darwin's theory. As so many others had noted, Darwin lacked the one proof that was absolutely essential for his theory, a "perfectly fertile hybrid animal." Until he produced one, his theory amounted to nothing.

<sup>83</sup>"The Present Attitude," 346-350.

<sup>84</sup>Review of *The Origin of Species by Natural Selection*, by Charles Darwin, 42 (April 1860), 335-339.

<sup>85</sup>Thomas Huxley wrote the review for the *Westminster* and Benjamin Carpenter, the noted physiologist, wrote the review in the *National*. Compare this more accurate understanding of Carpenter's review with the squib of the *Chicago Tribune* mentioned above.

Since Darwin believed that many of the existing genera were actually genetically related species, how did he know that those he considered to be fertile hybrids were, in actuality, not members of widely dispersed species? Darwin was surely right to lament how few geologists would agree with him that the geological record was so imperfect as to have destroyed all possible evidence of transitional forms. No reputable geologist believed this. Finally, Darwin's supposition that "life was first breathed" into some primordial form was really a more "stupendous miracle" than even the creation of mankind. Which was more miraculous: "an immediate creation of an organic man" or "a supply, at one instant, of a life sufficient for the start of a universal system" of life? The answer was self-evident to the reviewer.

W. C. Wilson, professor at Dickenson College, showed himself to be well-abreast of the unfolding debate in the English and American press on Darwin's theory. In less than two years, he observed, *The Origin* had already been read, discussed, and debated more extensively by scientists and the general reading public, in periodicals and scientific societies, than any other similar book.<sup>86</sup> That itself was a testimony to Darwin's well-deserved reputation as an English naturalist. As could be expected, Wilson noted, the opinions in England ranged from the *North British Review*, which condemned it as doing "open violence to everything which the Creator himself has told us in the Scriptures of truth of the methods and results of his workings," to the *Westminster Review*, which hailed it as "a veritable Whitworth gun in the armory of

<sup>86</sup>"Darwin on the Origin of Species," 43 *Methodist Quarterly Review* (Oct. 1861), 605-627

liberalism."<sup>87</sup> This breadth of opinion was matched in the United States where opinions ranged from the *North American Review* (April 1860) to the *Christian Examiner* (May 1860), which found the book to have marked atheistic tendencies, to Asa Gray's "very kindly tempered article" in the *American Journal of Science* (March 1860) and the "magnanimous" set of three articles in the *Atlantic Monthly* for July, August, and October 1860.<sup>88</sup> Perhaps, the truth lay somewhere in the middle where the respected French botanist, M. Pictet, in the *Bibliothèque Universelle* for March 1860, concluded that Darwin had illuminated a great deal of our understanding of speciation, but had extended his theory far beyond its warranted limits.

Wilson contended that Darwin's great display of learning merely confirmed the orthodox understanding of species. He summarized this understanding to mean that species included those individuals who were bound together both intellectually, through a plan in God's mind as Agassiz insisted, and materially, through a real genetic relationship, as Darwin insisted in his emphasis on community of descent. These species were immutable, though frequently highly variable, as Darwin had shown with his pigeons. Species thus differed in kind, not degree, as the transmutationists maintained; they were kept distinct by the "general law of the

<sup>87</sup>Wilson's review gives us an important clue to the depth of the American awareness of the extensive debate on *The Origin* in England. The anonymous review in the stolid *North British Review* was written by John Duns, a Free Church minister and amateur naturalist; the anonymous review in the "infidel" *Westminster Review* was written by Thomas Huxley.

<sup>88</sup>Wilson would not have known that Bowen wrote the anonymous article in the *North American Review*, John Lowell in the *Christian Examiner*, and Asa Gray in the *Atlantic Monthly*.

infertility of hybrids."<sup>89</sup>

Wilson focused a good deal of attention on the validity of Darwin's central analogies. Darwin's long discussion of domestic breeding in his first chapter laid the foundation for his central analogy between artificial and natural selection. He required his readers to accept the plausibility that the remarkable range of varieties produced in a limited time through artificial selection could be expanded almost infinitum with unlimited time under natural selection so that varieties gave rise to species. Darwin had singularly failed to offer any credible evidence for the transmutation of species. Despite his long and interesting discussion on the wide variations breeders had introduced into the ranks of pigeons, all he had left at the end were pigeons. Even beyond the limited life span of any one breeder, surely, Wilson thought, the six thousand years of man's history of domestication should be enough time to produce at least one new specie, but Darwin had found none. Instead of proof Darwin told fanciful stories about bears transmuting into whales. "After his great display of his facts and his promise of more to come, we are surprised to find that they prove so little to the point. Some are unreliable, some prove nothing, (that we can see), others can be made to prove just as much on one side as the other." Wilson concluded that the "whole argument from variation under domestication to establish the probability of specific variation in nature, we consider a complete fallacy which proves nothing." Darwin seemed more to have invented his theory than to have

<sup>89</sup>"Darwin on the Origin of Species," 609.



discovered it.<sup>90</sup> Darwin's central analogy thus failed to persuade Wilson, along with many others.

Wilson challenged the way Darwin transferred the uniformitarian principles Lyell had established for geology to the creation of new species. Darwin argued that just as there were uniform forces and laws governing the formation of the earth's geology over immense aeons of time so also were there uniform forces governing the origin of species through immense aeons of time. Wilson disputed this central analogy, agreeing with Darwin that "analogy may be a deceitful guide." From Wilson's perspective, there was simply no parallel between "the changes of form in inorganic matter and the production of living beings with all their existing diversity," since organic matter contains "an entirely new element . . . which . . . we call vitality, or vital matter." Thus, "until this link in the chain is supplied, until we are able to account for the first production of vital phenomena by the operation of physical forces previously existing, we are not prepared to form any consistent hypothesis to explain the origin of the present diversified forms of living beings."<sup>91</sup> Wilson saw no parallel between Lyell's uniformitarian geology based on visible forces, which he accepted, and Darwin's uniformitarian principle of natural selection based on invisible forces.

In a very interesting aside, Wilson challenged Darwin's understanding of the struggle for existence in the animal kingdom as well as human society. Darwin had

<sup>90</sup>"Darwin on the Origin of Species," 621-623.

<sup>91</sup>"Darwin on the Origin of Species," 614.

been struck in his early reading of Malthus's *Essay on Population* by the Malthusian principle of the incessant and inevitable struggle for existence. This gave him a crucial insight into how new species were formed. Only those individuals survived this battle who possessed favorable variations that they could pass on to their progeny.<sup>92</sup> "Hence, as more individuals are produced than can possibly survive, there must in every case be a struggle for existence, either one individual with another of the same species, or with the individuals of distinct species, or with the physical conditions of life. It is the doctrine of Malthus applied with manifold force to the whole animal and vegetable kingdoms."<sup>93</sup> Such an alleged law, Wilson contended, had no place whatsoever in God's creation. Its operation in human society had been proven false by Henry Carey and other political economists in England and America. He was convinced that scientists would prove it to be equally "false and wicked" in understanding the plant and animal kingdoms.

This comment reflects a distinctly American perspective. Carey was one among a fair number of American political economists and Scottish moralists who rejected, or at least modified, what they considered to be the pessimistic teachings of the Manchester School of economists. They rejected Malthus, in particular, because a high birthrate was a boon to economic productivity in America. Francis Bowen argued in his own textbook on *Political Economy* that a high birthrate among the poor

<sup>92</sup>Darwin's transmutation *Notebook D*, 134e-135e, records Darwin's prosaic first interpretation of Malthus; his *Autobiography*, 120, records his more dramatic recall of this first reading.

<sup>93</sup>*The Origin of Species*, 63.

was the result of ignorance and lack of economic aspirations. Give the poor education and hope for prosperity and they would reduce their birthrate without having to endure famine and pestilence. Besides, these theorists maintained, God had so provided the means to the economically successful that they should take care of the unfortunate.

Wilson was calling attention to the fact that the Malthusian doctrine of the struggle for existence had no place in American society or, by implication, in an American understanding of the organic realm.<sup>94</sup>

Wilson believed that, despite his protest to the contrary, Darwin had transformed his modest scientific goal of demonstrating that varieties were incipient species into a full-fledged cosmogony dealing with the origin of life. This was clearly shown in the book's conclusion where he argued that all plants and animals had descended from four or five progenitors. He then became even bolder and declared that, on the basis of analogy, "all organic beings which ever had lived on this earth have descended from one primordial form into which life was first breathed." But why stop there? Wilson wondered. Why not forge ahead and make his development theory complete by making "this form the result of the action of physical forces on inorganic matter?" He could then declare the "omnipotence of matter" and eliminate "a primary or efficient cause altogether." Darwin may have been either inconsistent or timid in drawing back here, but at least he had "escaped the bottomless pit of atheism."<sup>95</sup>

<sup>94</sup>Henry Carey, *Principles of Political Economy* (1837-1840); Francis Bowen, *Political Economy* (1856); Howe, *The Unitarian Conscience*, 240. Bowen later elaborated his criticism of "Malthusianism, Darwinism, and Pessimism," *North American Review* 129 (Nov. 1879): 447-472.

<sup>95</sup>"Darwin on the Origin of Species," 612.

Wilson also mused on the fact that "haphazard and accidental as his natural selection seems to others, to him it appears endowed with the highest attributes of wisdom and omnipotence." He then quoted Darwin's famous passage from chapter four to show how Darwin had given natural selection these attributes of divinity: "It may be said that natural selection is daily and hourly scrutinizing, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life."<sup>96</sup>

After recounting Darwin's familiar theory of how natural selection formed the eye and other specialized organs, Wilson wondered if this account was not more fabulous and a greater strain on credibility than was the traditional doctrine of special creation. In any case, Wilson believed that "the transmutationists . . . ought to have charity for those who are still weak enough to hold the belief in the doctrine of final causes."<sup>97</sup>

Wilson concluded that there was no need to discuss the theological bearing until Darwin had established his theory. If and when that happened, which Wilson doubted, there would be plenty of time to discuss it then. In the meantime he expected that natural selection will "prove a delusion, and that science will consign it

<sup>96</sup>"Darwin on the Origin of Species," 623; quotation from *The Origin of Species*, 84. Wilson here caught a hint of Darwin's persistent and strong temptation to deify Natural Selection. He had toned down this tendency a great deal from his imaginary "Being" in the "Essay of 1844."

<sup>97</sup>"Darwin on the Origin of Species," 625.

to its appropriate place in the museum of curious and fanciful speculations."<sup>98</sup>

The tone and spirit of the early reviews of the *Origin* by scientists and theologians stand in marked contrast to the received stereotypes. The few scientists who did respond offered remarkably fair, calm, and pertinent scientific criticisms that were often shared by their British counterparts. If we add the names of Gray, Rogers, Wyman, and the Cambridge Positivists, we get a much different picture of the early scientific response to Darwin in America than is generally painted.

The contrast between the early theological reviews and the traditional interpretation is even more dramatic. Paul F. Boller would have us believe that

for orthodox Protestants, reared in Biblical literalism and Scriptural infallibility, Darwinism shattered the Christian cosmos. It destroyed the idea of a personal God, intervening in His creation as He saw fit, demolished the Biblical account of the origin of life, and consigned Biblical chronology (whereby James Ussher, Archbishop of Armagh in the seventeenth century, had calculated that creation began in 4004 B.C.) to the dustbin. It also ruled out the classic Christian doctrines: the fall of man, the Virgin Birth, the divinity of Christ, immortality, and the Christian scheme of redemption. At best, evolution substituted a remote First Cause for the Christian God; at worst it was completely silent as to ultimate causes and purposes.<sup>99</sup>

Even Jon Roberts argues that, after their aggressive denunciation of *Vestiges* prepared them to battle the *Origin*, "many Protestant intellectuals concluded that the Darwinian hypothesis undermined the conviction that the history of life was the

<sup>98</sup>"Darwin on the Origin of Species," 627.

<sup>99</sup>Paul F. Boller, Jr., *American Thought in Transition: The Impact of Evolutionary Naturalism, 1865-1900* (Chicago: Rand McNally & Co., 1969), 23-24.

realization of a creative plan initiated and governed by a Christian Deity."<sup>100</sup> The contrast between these interpretations and the actual early reviews is so stark that one often wonders if scholars were reading the same sources. Whatever weaknesses the theological reviews shared, their denunciation of Darwin for his baleful influence on Christian orthodoxy was not among them.

The most consistent theme in the theological quarterly reviews was that Darwin had failed to pass the stern philosophical tests the authors presumed were commonly accepted for verifying the credibility of all scientific theories. Scholars assumed that they and Darwin shared a unified field of knowledge in science, philosophy, and theology, that all of them were living under the broad umbrella of natural theology. Virtually all of them followed Bowen in claiming that they were not judging Darwin's theory by the external criteria of either theology or the Bible, but by the internal criteria of the inductive philosophy. Most of them had a fairly sophisticated understanding of what those criteria were, often going so far as to give Darwin a refresher course on the fundamentals. On those grounds they found that Darwin had provided insufficient evidence to substantiate his theory, the most common being the lack of transitional forms in the geological record, fertile hybrids, and a view of species that ran counter to ordinary experience. They also charged Darwin with egregious lapses of logic in drawing faulty analogies between artificial and natural

<sup>100</sup>Jon H. Roberts, *Darwinism and the Divine in America*, 16, 252 n.39. Roberts cites sources scattered throughout the 1860s and across the theological spectrum, including some that we have used, to substantiate this conclusion. Yet the contrast between that which Roberts imputes to them and what they actually said is substantial.

selection, adopting unwarranted conclusions from his uniformitarian postulate, and failing to heed the limits of induction with his speculations on the origins of life. Several were deeply troubled by Darwin's materialistic tendencies and vacuous view of God, but most were willing to give Darwin the benefit of the doubt on whether his views were consistent with theism. Virtually all were confident that when and if Darwin's theory was adequately demonstrated, it could be easily harmonized with Christian orthodoxy. Whatever else must be said about these early reviews, they must be appreciated for their often astute analysis of the philosophical lapses of the *Origin* by the established canons of what they perceived to be "good" philosophy.

The major shortcoming of these early reviews was not that they mangled Darwin's theory beyond recognition or held it up to theological ridicule, but that their criticisms were largely irrelevant in the new Positivist world explored by the *Origin*. The unified field of knowledge they presumed had been shattered beyond repair. No longer were Darwin and a significant part of the scientific community living under the tent of natural theology. Darwin and the Positivists were challenging their most basic philosophical, scientific, and theological assumptions. Yet they were unable to identify and expose the roots of those challenges. Darwin could not be dismissed so easily for violating the standards of inductive philosophy or criticized for failing to provide empirical evidence for his theory when he, and many others, had long ago abandoned those criteria as irrelevant to unraveling the empirical complexities of the "species problem." Zeal to maintain the verities of natural theology without a nuanced understanding of the Positivist threat was the theologians' downfall.

As underscored in the second chapter, there were significant dilemmas, ambiguities, tensions, and discrepancies with the traditional natural theology framework that a fuller understanding of the complexities in the natural world revealed. It was precisely those kinds of scientific problems with the "ordinary view of creation" that Darwin challenged in the *Origin*. He was challenging, not so much the theological validity of the "ordinary view," but its superficiality as a research guide for understanding the world he was investigating first-hand. A proper critique of Darwin required a credible understanding of the "species problem" in all of its many facets. Darwin's abundant factual material required that this "problem" could no longer be answered by appeals to criteria Darwin and his peers had long since found wanting. Darwin had to be met on his own ground; his questions needed to be answered; his fundamental assumptions critiqued. Without that understanding the philosophical criticisms of the theological reviewers, however astute and on the mark some of them undoubtedly were, simply glanced off Darwin as irrelevancies. The "species problem" remained to be solved. No wonder even orthodox scientists were irked by the great dangers their misinformed and ignorant clerical brethren posed for the health of orthodoxy in the coming age of science.

Edward Hitchcock, the dean of American Scriptural geologists and president of Amherst College, foresaw the depths of this threat already in 1851. He prophesied that the greatest danger to the Church in the coming decades would come from the doctrines of materialism and skepticism that were nurtured by the new natural sciences, particularly physiology, biology, zoology, and geology. He lamented that



ministers and theologians were, however, woefully ill-prepared to address those issues. None of the seminaries offered any instruction in the natural sciences, beyond the most cursory overview. Most seminary students took so few courses in these subjects that they "scarcely find out how ignorant they are of the subjects; and hence those who are expecting to enter the sacred ministry vainly imagine that, at almost any period of their future course, they can, in a few weeks, become sufficiently acquainted with physical science to meet and refute the sceptic." How can someone so grossly ill-prepared "judge correctly of points and reasoning difficult to be mastered by adepts in these sciences? How certain to be worsted in an argument with an accomplished naturalist who is a sceptic!" Answering the arguments of materialists with "mere metaphysical abstractions by which they are usually met excite only the contempt of the acute physiologist who is a materialist."

Hitchcock implored wealthy benefactors to endow special chairs in the seminaries devoted to the intensive study of the religious bearing of the natural sciences.<sup>101</sup> Judging by the theologians' response to Darwin, seminary educators, with the lone exception of James Woodrow, had not heeded Hitchcock's warning nine years later. They were still defending the old philosophical verities with

<sup>101</sup>Edward Hitchcock, *The Religion of Geology and its Connected Sciences* (Boston: Phillips, Sampson, and Co., 1851), preface. When colleges and seminaries eventually did respond to the challenges of science, they established apologetics courses that defended the harmony of science and religion. Of course, such courses assumed what the scientific culture was disputing. They had a significantly different content and focus than did the demanding courses in the natural sciences that Hitchcock envisioned for properly training the clergy in meeting the new challenges of science. An expanded edition of *The Religion of Geology* was brought out in 1859 in response to popular enthusiasm for Hitchcock's serene assurance of the harmony of science and religion. Not even Hitchcock could anticipate the troubles that lay ahead for even well-trained orthodox naturalists.

"metaphysical abstractions." The gulf between the curriculum of the colleges and seminaries and the realities of science only widened in subsequent years. The Church girded ministers to wage the battles of days gone by and exposed them to attacks for which they were ill-prepared. Would Asa Gray's response to Darwin fare any better?