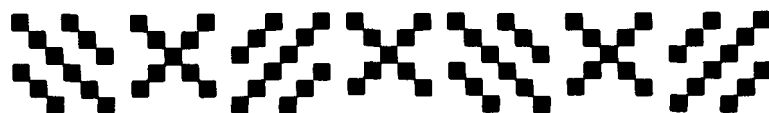


## Joseph Moore: Quaker Evolutionist

*William Cooper\**



In America the evolution debate has been interpreted as a conflict between supporters and opponents of Darwinism. In this context experimental science and liberal theology confronted teleological natural science and fundamentalist religion. While this explanation has been useful for understanding the general outlines of the conflict, it obscures and simplifies the variety and diversity within evolutionary thought as well as its religious significance. Darwinism, grounded on the belief that species evolved through a process of natural selection or survival of the fittest, was not the only evolutionary theory; and neither evolution nor Darwinism were fixed and static. They proved to be pliable and amorphous concepts having different meanings within different cultural and intellectual traditions.<sup>1</sup>

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<sup>1</sup> For accounts that stress the unitary character of both sides in the conflict over evolution see Richard Hofstadter, *Social Darwinism in American Thought* (Boston, 1953), especially 13-30; John Dewey, *The Influence of Darwin on Philosophy* (Bloomington, 1965); Bert James Loewenberg, "Darwinism Comes to America, 1859-1900," *Mississippi Valley Historical Review*, XXVIII (December, 1941), 339-68; Bert James Loewenberg, "The Reaction of American Scientists to Darwinism," *American Historical Review*, XXXVIII (July, 1933), 687-701; Sidney Ratner, "Evolution and the Rise of the Scientific Spirit in America," *Philosophy of Science*, III (January, 1936), 104-22. A. Hunter Dupree, *Asa Gray, 1810-1888* (Cambridge, Mass., 1959) and Edward Lurie, *Louis Agassiz: A Life in Science* (Chicago, 1960) discuss the differences within evolutionary thought. John C. Greene, "Darwin and Religion," *Proceedings of the American Philosophical Society*, CIII (1959), 716-25, and Stow Persons, "Evolution and Theology in America," in Stow Persons, ed., *Evolutionary Thought in America* (New Haven, 1950), 422-53, give some notice to the variety in the religious responses to evolution. For a thorough bibliography of recent Darwin studies see Bert James Loewenberg, "Darwin and Darwin Studies, 1959-1963," *History of Science: An Annual Review of Literature and Teaching*, IV (1965), 15-54.

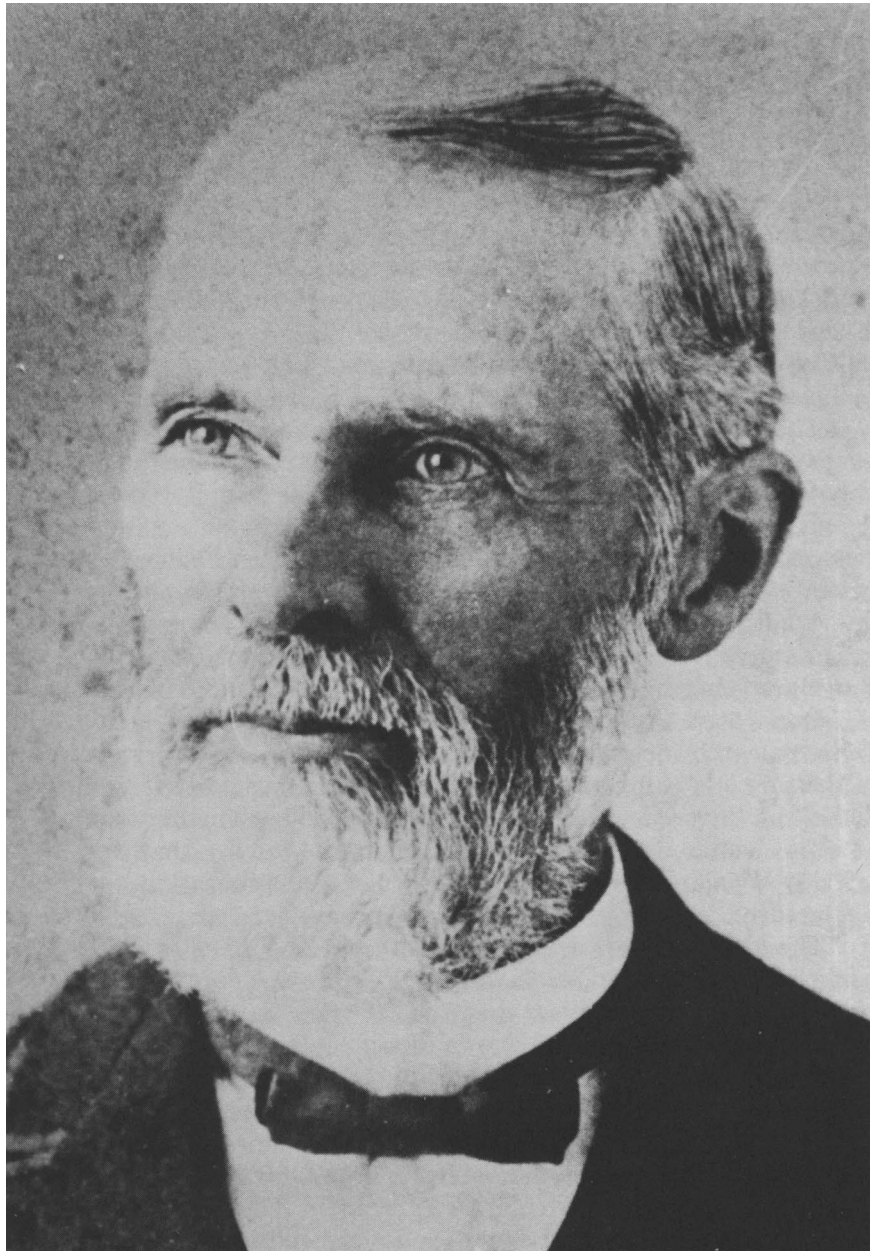
One striking example of the variety and flexibility of the idea of evolution occurred in Indiana during the mid-nineteenth century. As early as 1861, evolution, including Darwin's interpretation, was taught to devout Quakers at Earlham College, Richmond. The subject was introduced at the Quaker institution by Joseph Moore, who had studied natural science at Lawrence Scientific School, Harvard University, when Harvard was the center of the evolution debate. Dedicated to scientific truth, Moore adopted an evolutionary perspective and adapted it to conform to the devout Quaker beliefs he shared with his community. Concerned with a set of problems ignored in the national debate, Moore struggled to find his own meaning in the new science, and his solution was unique, imaginative, and courageous. Moore's Quaker evolutionism exemplifies the diversity and variety among those who accepted and defended this idea in America in the second half of the nineteenth century.

Moore had entered Harvard in the fall of 1859 with a commitment both to science and to his religion. From the beginning of his education in rural Quaker schools, Moore had trained himself in science. In 1853 his scientific knowledge had earned him a teaching position at the Friends Boarding School in Richmond. When Earlham College was created in 1859, Moore was named professor of natural science, and funds were provided for his further scientific education. Other newly appointed faculty studied at Haverford College, Pennsylvania, also a Quaker institution; but the famous Louis Agassiz and the chance for a quality education in science attracted Moore to Harvard.<sup>2</sup>

From the beginning Moore's science was a manifestation of his religious commitments. His early Quaker training had instilled in the man a strong desire to serve God and to understand His will and works, and Moore's science was devoted to these goals. For Moore nature was an expression of God's mind and His will, and he sought to serve God

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<sup>2</sup> Biographical information on Joseph Moore was drawn from Opal Thornburg, *Earlham: The Story of the College, 1847-1962* (Richmond, Ind., 1963), 97-101, *passim*; *The American Friend*, XII (Seventh month 20th, 1905), 475-76; Royal Davis, "A Biographical Sketch," *The Earlham College Bulletin*, II (August, 1905), 9-12; Will E. Eddington, "Biographical Sketches of Indiana Scientists Not Listed Elsewhere, I," *Proceedings of the Indiana Academy of Science*, LXX (1960), 186-87; autobiographical notes written by Joseph Moore in April, 1893, type-script copy in Presidential Papers (Earlham Archives, Richmond). Thornburg, *Earlham*, 76-79, *passim*, discusses the founding of Earlham College.



**JOSEPH MOORE**

Courtesy Lilly Library, Earlham College,  
Richmond, Indiana

through the examination and observation of nature. Shortly before his enrollment at Harvard, Moore noted his growing confidence in his own scientific ability and what it meant to him. "If there is aught for which I am thankful," he wrote in 1858, "it is that I am endowed with a capacity to appreciate in *some degrees* the beauties which God has so profusely scattered around us and in these to trace His wisdom and read His benevolent designs."<sup>3</sup> At Harvard the Quaker intended to improve his own talents so that he could more effectively teach coreligionists how to read God's wisdom and designs in nature.<sup>4</sup>

The Harvard that Moore entered in the fall of 1859 must have contrasted dramatically with his expectations. The university was the center of complex changes rapidly transforming the character of science in America from an amateur avocation to a specialized profession. In scientific education specialized training and research methods were replacing the traditional gentlemanly study of natural philosophy and natural history. At Harvard Agassiz was collecting and classifying specimens to complete his massive Museum of Comparative Anatomy which he had established as a national research institution. At the same time he was actively cultivating a role for science and scientists in national affairs. Asa Gray labored in a rapidly expanding herbarium that was the center for plant classification in North America. Jeffries Wyman had earned an international reputation for his research in embryology and comparative anatomy.<sup>5</sup>

The debate over evolution, also centered at Harvard, symbolized these changes in science. Agassiz defended the conventional scientific view that species were immutable and uniquely created by God. Gray, in direct correspondence with Charles Darwin, spoke for the origin of species by descent with modification based on material laws. Others, including Wyman, cautiously weighed the scientific evidence but made no firm commitment to either view. These alternatives were being debated as Moore entered Harvard. When Darwin's *Origin of Species* reached America in December, 1859, the

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<sup>3</sup> Joseph Moore diary, "Memoranda," Tenth month 22nd, 1858, Presidential Papers.

<sup>4</sup> Moore diary, Eleventh month 13th, 1859, Presidential Papers.

<sup>5</sup> The changes in the character of science in America and their connection with the debate over evolution are discussed in Dupree, *Asa Gray*, 216-83, *passim*; and Lurie, *Louis Agassiz*, 252-302, *passim*. See also A. Hunter Dupree, *Science in the Federal Government: A History of Policies and Activities to 1940* (Cambridge, Mass., 1957), 135-48.

debate escalated and expanded to include theological as well as scientific issues.<sup>6</sup>

During his two year tenure at Harvard, Moore carefully and cautiously pursued his scientific education within this climate of controversy. Older than most of his fellow students and isolated by his Quaker manners, Moore was suspicious of the general intellectual atmosphere at the university. Shortly after arriving, he remarked on the "careless state of mind" prevalent around him.<sup>7</sup> Later he noted that he was surrounded by those who lightly valued the teachings and doctrines of the divine record. He prayed that he be unshaken by the opinions of others, "however learned or talented[,] who deny that Jesus Christ was *true God* and *perfect man*."<sup>8</sup> But Moore maintained his faith that scientific truth and religious truth could not conflict. The controversy did not intimidate him; he remained cautious, but his intellectual honesty and desire for knowledge compelled him to consider all scientific ideas, however dangerous.

Even if he had tried, Moore could hardly have avoided contact with the new evolutionary science. He was in close contact with all the principal participants of the debate; he was enrolled in Agassiz's geology and zoology classes, attended botany lectures by Gray, and studied comparative anatomy and embryology with Wyman. The question of the origin of species and biological evolution occupied a major portion of these classes. Moore's notebook and diary indicate that he faithfully studied the ideas of each teacher and tried to understand their significance for his own beliefs and ideas.<sup>9</sup>

In the geology and zoology lectures that Moore attended, Agassiz attacked evolutionary theory with vengeance. The Quaker kept detailed notes of Agassiz's classification system and his violent attacks on evolution or the "developmental hypothesis."<sup>10</sup> The professor forcefully outlined the scientific

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<sup>6</sup> Dupree, *Asa Gray*, 248-63; A. Hunter Dupree, "The First Darwinian Debate in America: Gray versus Agassiz," *Daedalus*, LXXXVIII (Summer, 1959), 560-69; Lurie, *Louis Agassiz*, 252-302; A. Hunter Dupree, "Jeffries Wyman's Views on Evolution," *Isis*, XLIV (September, 1953), 243-46.

<sup>7</sup> Moore diary, Eleventh month 29th, 1859, Presidential Papers.

<sup>8</sup> Moore diary, Seventh month 8th, 1860, Presidential Papers.

<sup>9</sup> Moore diary, especially Third month 13th, 1860; Joseph Moore, Harvard class notebook, Presidential Papers.

<sup>10</sup> The notes from Moore's classes are contained in his Harvard class notebook, Presidential Papers. Agassiz lumped all evolutionary theory, including Darwin's, under the older term "developmental hypothesis."

evidence in opposition to an evolutionary explanation, but he was preoccupied with the theological implications of the new doctrine. For Agassiz the animal world was a manifestation of the thoughts of the Creator and these thoughts were perfect and immutable. Any apparent change in species was not a physical transmutation; rather, it was an intellectual connection which existed in the mind of God. He felt that the development hypothesis denied the existence of God's plan because the blind chance of material forces could not cause the design evident in nature. At the same time the absence of design implied the absence of a Designer or Creator; thus the development theory was atheistic and unacceptable. Agassiz challenged defenders of evolution to demonstrate how and why the plan of the perfect Creator could or should be changed once it had been expressed in its perfection.<sup>11</sup>

The geologist's scientific ideas strongly influenced Moore and offered him the kind of interpretation he sought. He shared Agassiz's conviction that the mind of God could be read in nature. In particular Moore was impressed by Agassiz's theory of prophetic types, which proposed that certain animals or "prophetic types" carried traits that became distinct in later geological periods—types which could be used to account for any evidence of a physical connection between species. Rather than providing a physical link between species, prophetic types "foreshadowed" the development of new types in the future. They provided clues to the character of later species and offered solid evidence that the design of nature was known in advance of its execution. In addition to reinforcing Moore's general approach to nature and providing him with specific ideas, Agassiz also taught the Quaker the practical details of classification and museum management.<sup>12</sup>

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<sup>11</sup> Moore, Harvard class notebook, Presidential Papers. Agassiz's most explicit statement of his approach to nature is Louis Agassiz, *Essay on Classification*, ed. by Edward Lurie (Cambridge, Mass., 1962). For a discussion of Agassiz's interpretation of evolution see Lurie, *Louis Agassiz*, 252-302; Edward Lurie, "Louis Agassiz and the Idea of Evolution," *Victorian Studies*, III (September, 1959), 87-108; Ernst Mayr, "Agassiz, Darwin, and Evolution," *Harvard Library Bulletin*, XIII (Spring, 1959), 165-94.

<sup>12</sup> Moore, Harvard class notebook, Presidential Papers. [Louis Agassiz], "On the Differences between Progressive, Embryonic, and Prophetic Types in the Succession of Organized Beings through the whole Range of Geological Times," *Proceedings of the American Association for the Advancement of Science*, II (1849), 432-38. Moore discussed his training under Agassiz in Joseph Moore, "Louis Agassiz," *The Guilford Collegian*, III (May, 1891), 226-30.

Despite his sympathy with Agassiz's perspective, however, Moore remained skeptical of the professor's doctrine. His dogmatism and intolerance dissatisfied Moore and apparently he doubted that Agassiz had given all the evidence for evolution a fair hearing. His class notes suggest that he became bored with Agassiz's repetitious harangues against the developmental theory.<sup>13</sup> Several points in the geologist's theory may have troubled Moore's Quaker sensibilities. Agassiz's argument for a series of separate and complete creations conflicted more with the standard biblical account than the developmental hypothesis, and his assertion that races were different species contradicted the Quaker doctrine of the brotherhood of all men. In addition, Moore might have found an offensive flavor of unitarianism in Agassiz's ideas. An Indiana Quaker cautioned Moore about the prevalence of unitarian ideas among his "preceptors" at the university.<sup>14</sup> Moore may have been uncomfortable with Agassiz's abstract, omnipotent God that created and then sat back, only later to destroy and recreate. The strongly deterministic cast of Agassiz's ideas were also potentially disturbing. Moore's Quaker beliefs in an "inner light" and man's capacity for direct communication with God would have required proof of a continually acting God, one that was not only omnipotent but also omnipresent in a personal and directly accessible form.

Moore was equally skeptical of Gray, Agassiz's major opponent in the evolution debate.<sup>15</sup> Gray asserted that Agassiz's position was "theistic to excess," while Darwin's was "strictly scientific."<sup>16</sup> Acknowledging that Darwin's theory

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<sup>13</sup> Moore, Harvard class notebook, Presidential Papers. Later in his life Moore praised Agassiz but remarked on his demanding character. Moore, "Louis Agassiz," and Joseph Moore, "The Life of Agassiz," *The Earlehamite*, XIII (March, 1886), 130-33.

<sup>14</sup> Elijah Coffin to Joseph Moore, Twelfth month 16th, 1859, photocopy in Presidential Papers.

<sup>15</sup> Although Moore earned a degree in botany, Gray's specialty, notes from Gray's lectures cannot be found among Moore's scientific papers. In his class notebook Moore mentioned missing one of Agassiz's lectures so that he could hear Gray speak. Harvard class notebook, Presidential Papers. In autobiographical notes written in 1893 Moore noted that he studied botany under Gray. A typescript copy is in the Presidential Papers.

<sup>16</sup> Asa Gray, "Review of Darwin's Theory on the Origin of Species by means of Natural Selection," *American Journal of Science and Arts*, 2nd series, XXIX (March, 1860), 156. For a full account of Gray's position see Dupree, *Asa Gray*, 233-306, *passim*.

was materialistic, Gray argued that this did not mean that it was atheistic. Gray found no theological objection to the view that God enacted his design through material causes and material laws: for the botanist God established laws and oversaw their material action in order to implement his pre-conceived and preordained plan of creation. While this interpretation appears more compatible with Moore's belief in an active and omnipresent God, Moore apparently felt that Gray's defense of the new doctrine was inadequate. Moore could not assent to a God that was merely a law giver and, in the end, Gray's God remained as remote and abstract as that of Agassiz. Gray's interpretation was marred by the same strong predeterminism as that of his colleague. Moore's notes and diary seem to suggest that the theological implications of the evolution debate at Harvard did not touch the core of his religious and intellectual concerns.

Although Moore apparently never explicitly recorded his own reaction to evolutionary theory while at Harvard, a reference to the developmental hypothesis in his class notebook reveals the issues most important to him. Moore noted a pre-Darwinian attack on the developmental hypothesis by Hugh Miller, the Scottish "lyrical geologist," and Agassiz's friend.<sup>17</sup> In *Foot-prints of the Creator* Miller responded to *The Vestiges of the National History of Creation*, an early defense of evolution published anonymously in 1844. In contrast to the theological issues debated by Gray and Agassiz, Miller directed his primary concern to the moral and ethical implications of evolution. He argued that the question of design was irrelevant for deciding scientific issues—a belief in a First Cause was compatible with any theory of nature, including evolution—and pointed to more important issues: that evolutionary theory denied the immortality of the soul and life after death. Without these beliefs Christian morals and ethics were meaningless. The developmental hypothesis denied the resurrection and man's hope for salvation. The hypothesis was not necessarily atheistic, but Miller asserted that "a belief in the existence of God is of as little *ethical* value as a belief in the existence of the great sea-serpent" unless

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<sup>17</sup> Moore's reference to Miller's work appears under the heading of "Animal life" in his Harvard class notebook, Presidential Papers.



it is associated with man's morality and responsibility within a scheme of salvation.<sup>18</sup>

For Moore, Miller raised pragmatic religious and ethical issues ignored in the theological debate at Harvard. Moore never questioned that evolution or any other scientific idea was compatible with a belief in God, but he needed to know the significance of evolution for his absolute beliefs in an "inner light," man's soul, the life eternal, and Jesus Christ as Saviour and Redeemer. It appeared that until he clarified the practical meaning of evolution for these beliefs, he could make no firm commitment to the theory.

At Harvard, Moore seems to have been most comfortable on the middle ground provided by Wyman.<sup>19</sup> Unlike Agassiz, Wyman presented to his classes the evidence for both interpretations of the origin of species. Moore recorded Wyman's discussion of "prophetic types" and foreshadowing as well as evolutionary development. His classroom demonstrations greatly impressed Moore and those classes were his favorites. From him Moore acquired a dispassionate respect for the scientific evidence favoring evolution, as well as a model for his own teaching. But Wyman intentionally provided no help in understanding the religious implications of the doctrine.<sup>20</sup>

Moore acquired much more than he bargained for from his scientific education at Harvard. While he learned to read God's mind in nature with greater skill, this new ability raised more questions than it answered. Moore's confusion was evident in his statement that the most important thing

<sup>18</sup> Hugh Miller, *Foot-prints of the Creator; or, The Asterolepis of Stromness: With Memoir by Louis Agassiz* (Westmead, Farnborough, Hants., England, 1971), 17. For a discussion of *Vestiges of the Natural History of Creation* and Miller and his work see Charles Coulston Gillispie, *Genesis and Geology: A Study in the Relations of Scientific Thought, Natural Theology and Social Opinion in Great Britain, 1790-1850* (Cambridge, Mass., 1951), 149-83.

<sup>19</sup> Moore diary, Third month 13th, 1860, Presidential Papers.

<sup>20</sup> Moore, Harvard class notebook, Presidential Papers. For a discussion of Wyman's position on evolution see Asa Gray, "Jeffries Wyman," in Charles Sprague Sargent, ed., *Scientific Papers of Asa Gray*. Volume II, *Essays, Biographical Sketches, 1841-1886* (Boston, 1889), 375-402; A. S. Packard, "Memoir of Jeffries Wyman, 1814-1874," *National Academy of Sciences, Biographical Memoirs*, II (1886), 75-126; A. Hunter Dupree, "Jeffries Wyman's Views on Evolution," *Isis*, XLIV (September, 1953), 243-46; A. Hunter Dupree, "Some Letters from Charles Darwin to Jeffries Wyman," *Isis*, XLII (June, 1951), 104-10. See also William Coleman, trans. and intro., *The Interpretation of Animal Form: Essays by Jeffries Wyman, Carl Gegenbaur, E. Ray Lankester, Henri Lacaze Duthiers, Wilhelm His and H. Newel Martin, 1868-1888* (New York, 1967), xvii-xviii.

he learned at Harvard was the limit of human intelligence. He expressed his frustration, as well as his faith, in his assertion that "no man can know much in this life compared with what lies in the realm of the *vast unknown* at which my mind sometimes aches with a consciousness of its own incapacity and vague conception of what lies beyond the limits of the known."<sup>21</sup> The most difficult question that remained unanswered was the religious meaning of evolution, and he was prepared to examine the new idea with fairness and honesty. In 1861, armed with his new knowledge and its difficulties, Moore returned to Earlham College to teach science to Indiana Quakers.

Moore continued to struggle with the meaning of evolution throughout his life. Unable to ignore the mounting favorable evidence, he was increasingly swayed toward the evolutionary interpretation. But while his faith in the unity of truth convinced him that evolution could not conflict with his religious beliefs, the religious significance of evolution continued to puzzle him. In the end, Moore devised an interpretation quite different from that of Gray or Agassiz; but it was more than fifteen years before he publicly presented a completed statement of his position.

Moore's career in science reflected his Harvard training. His professional activities were devoted to collecting fossils and specimens for a natural history museum modeled on that of Agassiz. Although his research did not directly relate to problems of evolution, his interest in paleontology brought him in continuing contact with the evolutionary debate.<sup>22</sup> In

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<sup>21</sup> Moore diary, Seventh month 16th, 1861, Presidential Papers.

<sup>22</sup> Moore's scientific accomplishments are outlined in the biographical sources in footnote 2 above. See especially Eddington, "Biographical Sketches," 186-87. To transform the cabinet that he had started at Harvard into a museum of natural history, Moore traded specimens with other scientists, including James Dana of Yale. James Dana to Joseph Moore, December 24, 1863, Presidential Papers. Moore collected fifteen barrels of specimens for the museum during a trip to Hawaii in 1874. Through his entrepreneurial efforts a new building was constructed at Earlham to house the museum, and Moore served as curator and professor of geology. His major scientific accomplishment was the recovery and reconstruction of the skeleton of the giant fossil beaver (*Castoroides ohioensis*) which until recently was the only complete skeleton of its type in existence. He published several papers in scholarly scientific journals in connection with his work on this rare specimen. Moore was a charter member of the Indiana Academy of Sciences and was named to a number of other societies including the American Association for the Advancement of Science. Moore's published papers included: Joseph Moore, "A Recent Find of *Castoroides*," *American Naturalist*, XXIV (August, 1890), 767-68; Joseph Moore, "Concerning some portions of

his teaching Moore followed the example of Wyman. He tried to present all available evidence and discuss all interpretations with tolerance and openness. For textbooks he chose Agassiz's *Essay on Classification* as well as Gray's *Treatise on Plants*, and he apparently made the *Origin of Species* available to his students.<sup>23</sup> Moore came to praise Darwin as the most perceptive and careful observer of nature, and by 1876 he commented favorably on Gray's interpretation of Darwin for the college newspaper.<sup>24</sup>

Moore accepted evolution in the faith that scientific and religious truth could not conflict. He noted that one should study the Bible and nature separately and then compare the results. Any apparent conflict was a consequence of human ignorance and would be resolved with better understanding. He criticized both scientists and clergy who distorted truth in an attempt to reconcile the apparent conflicts. Moore believed that it was "almost irreverent to fix up schemes to try to reconcile" them. If science seemed to conflict with scripture, he noted that the best policy was to "wait and these differences will adjust themselves."<sup>25</sup>

But evolution was a sensitive topic in a religious community. Apparently not all Quakers had Moore's faith or patience. Moore soon gained a reputation as a Darwinist and evolutionist among his fellow Quakers. As the leading spokesman for science and a community leader, he was under continual pressure to explain the new doctrine and its religious meaning to the general public.<sup>26</sup> They would have

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*Castoroides Ohioensis* not heretofore known," *Proceedings of the American Association for the Advancement of Science*, XXXIX (1890), 265-67; Joseph Moore, "Description of a New Species of Gigantic Beaver-like Rodent," *Journal of the Cincinnati Society of Natural History*, XIII (April, 1890), 26-30; Joseph Moore, "Correction Concerning *Castoroides Georgiensis* So Called," *Journal of the Cincinnati Society of Natural History*, XIII (October, 1890), 103; Joseph Moore, "Concerning a Skeleton of the Great Fossil Beaver, *Castoroides Ohioensis*," *Journal of the Cincinnati Society of Natural History*, XIII (October, 1890), 138-69.

<sup>23</sup> Moore wrote to the superintendent of Earlham College outlining his choice of books. Joseph Moore to Walter Carpenter, July 12, 1861, Presidential Papers. See also the remarks by his student, Erastus Test, in Thornburg, *Earlham*, 100.

<sup>24</sup> Moore's comments on Darwin appear in an undated manuscript for a lecture entitled "Fertilization in Flowering Plants," Presidential Papers. The comments on Gray's work in *The Earlhamite* IV (November, 1876), 47-48, are attributed to Moore.

<sup>25</sup> Joseph Moore, undated notepad, Presidential Papers. The first half of the notepad contains notes concerning his Hawaiian trip which occurred in 1874.

<sup>26</sup> For Moore's reputation as an evolutionist see Thornburg, *Earlham*, 97, 99, *passim*. Lucy Moore Grave, Moore's daughter, recalls the Quakers' concern with Moore's evolutionism. "Conversation with Lucy

needed a clear and simple explanation that transcended the more technical and qualified classroom treatment. When the appearance of Darwin's *Descent of Man* in 1871 refueled the controversy, Quakers were probably as concerned as Moore to find a reassuring interpretation of the new scientific ideas.

Moore was not alone in his search for alternative explanations of evolution. Like Moore a large number of Agassiz's former students were convinced by the scientific evidence for evolution. These students formed the nucleus of a group which explained evolution using the principles developed by the early nineteenth century evolutionist, Jean Baptiste de Lamarck. Like Darwin these neo-Lamarckians stressed the role of environment in the formation of new species. But for them variations in species occurred through the activity and effort of the organism in its environment. For neo-Lamarckians the change in animal characteristics induced by an organism's own effort and will was retained and transmitted in reproduction; offspring retained the acquired characteristics of their parents. The giraffe was a frequently cited and dramatic illustration of this process. It purportedly acquired a long neck as a consequence of the continual effort of stretching its neck to eat from high branches. For the neo-Lamarckians natural selection played a minor role; species varied as a consequence of their own effort through the use of their inherent internal powers and the subsequent transmission of acquired characteristics.<sup>27</sup>

Moore's scattered comments on evolution after he left Harvard show him groping toward a type of neo-Lamarckian explanation of evolution. In cryptic notes of 1871 he wrote that "physical conditions change species by development . . .

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Moore Grave, Jan. 5, 1960," Presidential Papers. Moore was appointed a Quaker minister in 1865. After the Civil War he organized schools in North Carolina for the Friends. In 1869 he was named president of Earlham College, a position he held for fourteen years. He visited the Hawaiian Islands for religious and scientific purposes in 1874. He later returned to North Carolina and was instrumental in founding Guilford College. He received honorary degrees from Indiana University and Haverford College.

<sup>27</sup> Edward J. Pfeifer, "The Genesis of American Neo-Lamarckianism," *Isis*, LVI (Summer, 1965), 156-67. For a discussion of the Lamarckian interpretation of evolution and its relationship to Darwinism see Loren Eiseley, *Darwin's Century: Evolution and the Men Who Discovered It* (Garden City, 1958), 46-52, *passim*; Charles Coulston Gillispie, "Lamarck and Darwin in the History of Science," in Bentley Glass, Owsei Temkin, and William L. Straus, Jr., eds., *Forerunners of Darwin: 1745-1859* (Baltimore, 1959), 265-91; Charles Coulston Gillispie, "The formation of Lamarck's evolutionary theory," *Archive Internationales d'Histoire des Sciences*, IX (October-December, 1956), 323-38.

certainly kill out many."<sup>28</sup> He concluded that life was determined by geographic and climatic conditions but that geological proof of this fact was limited. At the same time he also observed that varieties might be considered incipient species and praised Agassiz's idea of prophetic types. Moore's only marginal note in his own copy of Gray's *Darwiniana* also reveals an implicit neo-Lamarckianism. In response to a discussion of the relationship between eating habits and variation in species, Moore noted that Hawaiian chiefs had become almost a different race from the common people. This note suggests that he believed species could vary themselves as a consequence of their environmental conditions, in this case what they ate.<sup>29</sup>

Moore had direct contact with the neo-Lamarckians through E. D. Cope, their acknowledged leader, who, like Moore, was a Quaker and sensitive to the same issues that troubled Moore. Moore was particularly influenced by a lecture that Cope delivered at the Franklin Institute in 1874 titled "Consciousness in Evolution." Cope found a meaning for the evidence of design in nature quite different from that of Agassiz and Gray. Since animal structures evolved as a consequence of the effort or use exerted by the animal, Cope argued that the design displayed in nature was an expression of the intelligence possessed by the animal itself. Evidence of design demonstrated that animal evolution was a continual process of the extension and development of consciousness or mind in individual organisms. Whenever consciousness had developed in a species, the species had evolved to a higher form. When consciousness gave way to habit and inaction, the evolution stopped. For Cope intelligence was located in the individual species and design was an expression of individual intelligence. At the same time the increasing complexity of design evident in nature demonstrated the continual development of individual consciousness or mind.<sup>30</sup>

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<sup>28</sup> Joseph Moore diary for 1871, Presidential Papers.

<sup>29</sup> Moore's personal copy of Asa Gray, *Darwiniana: Essays and Reviews Pertaining to Darwinism* (New York, 1876), 28-29, Earlham Archives.

<sup>30</sup> E. D. Cope, "Consciousness in Evolution," *Penn Monthly* VI (August, 1875), 560-75. Moore kept an offprint of this article, signed by the author, among his scientific papers, Presidential Papers. Cope and the nature of his evolutionary ideas are discussed in the outdated and uncritical biography by his student, Henry Fairfield Osborn, *Cope: Master Naturalist* (Princeton, 1931), 527-54.

For someone attempting to discover the Christian meaning of biological evolution the neo-Lamarckian explanation offered a number of interesting possibilities. The neo-Lamarckians reintroduced the importance of individual consciousness and the role of individual effort into the evolutionary process. This consciousness could be interpreted as the working of a kind of "inner light" in each individual and as evidence of God working through the individual. The emphasis on the effort of the individual organism in the neo-Lamarckian explanation was compatible with an emphasis on the moral and spiritual effort of individuals and their responsibility for moral effort. The need for individual effort in development meant that the course of evolution was not predetermined or preordained. Similarly, the evolution of consciousness and the continual development of mind introduced an immaterial, spiritual aspect to the evolutionary process. This opened the possibility that man might develop or evolve spiritually as an individual and as a species.

Shortly after reading Cope, Moore explored these possibilities. He presented his long awaited interpretation of the meaning of evolution in a public lecture titled "Coming Events Cast Their Shadow Before."<sup>31</sup> This lecture was built around Agassiz's idea of prophetic types and foreshadowing. From the evidence of prophetic types Moore deduced a great law of foreshadowing. He explained that the geological formation of the earth foreshadowed the course of the development of plant and animal life as well as the course of man's development and the development of human civilization. The clearest example of foreshadowing, Moore suggested, was in animal structures. For example, the brain and the spinal structure of early fishes were prophets of the physical characteristics of man. Man was a perfect fulfillment of these early prophecies; he had the most perfect brain and the most perfect hands and he was perfectly upright. Man was most ideally adapted to the physical conditions of the present and this occurred through the physical process of adaptation.

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<sup>31</sup> Joseph Moore, "Coming Events Cast Their Shadow Before," n.d., Presidential Papers. *The Earlhamite* IV (December, 1876), 69, announced that Professor Moore was giving a series of public lectures on evolution. It appears that "Coming Events" was part of this series. Other lecture notes in his papers which closely follow the text of this lecture are dated as late as 1889.

Then, drawing on neo-Lamarckian ideas Moore gave this physical evolution concrete religious and ethical meaning. The evidence of the evolution of consciousness meant that man might evolve spiritually. Man was like a prophetic type, foreshadowing future spiritual life and the development of the soul. Although the scientific record seemed to indicate that man would not survive as a species, it also suggested a spiritual evolution of consciousness beyond physical life, or a life after death. The importance of effort in evolution also suggested to Moore the existence of an after life. He cited evidence that the wants and desires of all animals in earlier ages had been fulfilled. While animal wants were physical, man's highest wants were spiritual and the strongest was a desire for eternal life. The evidence seemed to indicate to Moore that just as the giraffe was not disappointed in its efforts to reach the highest branches, man would not be disappointed in his spiritual desires. For man, spiritual effort in this life determined the nature of spiritual life in the future. This affirmed the importance of morality and spiritual responsibility here on earth. Moore noted that this was in accord with the scripture: the Old Testament had foreshadowed the coming of Christ and His perfect life foreshadowed and promised a life in the future.

"Coming Events Cast Their Shadow Before" exemplifies what evolution meant to an Indiana Quaker. In it Moore successfully proved to himself and his community that there need be no conflict between scientific ideas and religious beliefs. With imagination and integrity Moore transformed Darwinsim into a form that had meaning within his cultural and religious tradition. As a result he not only maintained an important role for science in a religious community but also provided his fellow Quakers with strategies and weapons for dealing with the complex and challenging developments in American culture symbolized by the debate and eventual acceptance of evolutionary theory. Beginning with Moore faith in the essential unity of all knowledge and truth has been the foundation of a strong scientific tradition at Earlham College.<sup>32</sup>

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<sup>32</sup> The continuing scientific tradition at Earlham is discussed by M.S. Markle, "The Influence of Quakers on Science in Indiana," *Proceedings of the Indiana Academy of Science*, LXIX (1960), 243-46. See also Wilton N. Melhorn, "A Century and a Half of Geology in Indiana," *Proceedings of the Indiana Academy of Science*, LXXVI (1967), 113.