

“Sprouting the Seeds of Darwinism”: A History of Evolution at Cornell University in the Nineteenth Century

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Imagine Charles Darwin's excitement as he unwrapped the package from his publisher on November 3, 1859. His manuscript, which had consumed him for months and through ill health, was finally a book. He wrote back to his publisher saying, “I am *infinitely* pleased and proud of the appearance of my child.”² Among his original concerns about the *Origin of Species* were the 1250 original copies on which Darwin feared his publisher would lose money. The books sold in a single day. “I am astounded at your news of sale,” he wrote to the publisher. “I do rejoice that you have not have cause to repent of publishing; at one time I was extremely fearful [and] annoyed at thought that you might repent.”³

It seems unusual to see Darwin's fear over such trivial matters. Today we often equate his name with other novel scientific thinkers like Newton and Einstein. The theories he wrote and published in his “child” shook the foundations of science and influenced the natural sciences ever since. But before the book's public debut, Darwin expressed some

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² Letter from C. Darwin to J. Murray, November 3, 1859.

³ Letter from C. Darwin to J. Murray, November 24, 1859.

reservation on his work, writing, “God knows what the public will think.”⁴ The public was not the only force that concerned Darwin. He sent many copies to his friends, family and contemporaries including the great Swiss scientist Louis Agassiz, who was then at Harvard University. In a respectful letter, Darwin wrote, “I hope that you will at least give me credit, however, erroneous you may think my conclusion, for having earnestly endeavored to arrive at the truth.”⁵ Agassiz would soon after become a strong opponent of Darwin’s theory of natural selection as explained in the *Origin of Species*. His Harvard colleague and fellow evolutionist, Asa Gray, wrote to Darwin the next year saying, “The book annoys him; and I suppose the contrast I run between his theories and yours will annoy him still more.”⁶

The *Origin of Species*’ 1859 publication nearly coincided with a long, divisive political struggle in the United States. By contrast, the acceptance of Darwin’s theory by American scientists “was remarkably rapid,”⁷ though Agassiz remained a prominent exception. By 1873, the year of Agassiz’s death, scientists widely accepted the theory of evolution.⁸ Among American higher education officials, the sentiment was a less rapid reconciliation toward Darwinism. Richard Hofstadter describes how the old northeastern colleges - “steeped in irenic traditions”⁹ - were less antagonistic to Darwinism compared to southern universities or seminaries but still “swallowed, even stomachached evolution, [though] it was not truly to their taste.”¹⁰

Cornell University was the exception. It was one of the first nonsectarian colleges, a far cry from the norm in an era when every college was expected to have some form of religious affiliation. Before the Civil War, the purpose of a college was to provide a classical education “to train men for service in church or state.”¹¹ They were conservative institutions that promoted traditional, stagnant curriculums, particularly lacking in the area of science. From the Darwinian debates in the 1860s and 1870s, a level of antipathy arose toward religious authority in universities, weakening the traditional foundations of sectarianism,¹² and Darwinism itself “shattered the academic calm of many a cloistered

⁴ Letter from C. Darwin to A.R. Wallace, November 13, 1859.

⁵ Letter from C. Darwin to L. Agassiz, November 11, 1859.

⁶ Letter from A. Gray to C. Darwin, January 10, 1860

⁷ Richard Hofstadter and Walter Metzger. *The Development of Academic Freedom in the United States*. (New York: Columbia University Press, 1955), 320.

⁸ *Ibid.*, 322

⁹ *Ibid.*, 332

¹⁰ *Ibid.*, 339

¹¹ Walter P. Rogers *Andrew D. White and the Modern University*. (Ithaca, New York: Cornell University Press, 1942), 18

¹² Hofstadter and Metzger, 344

hall.”¹³ From this debate, a sense of academic freedom surfaced among institutions of higher learning, especially the belief that science ought to exceed any religious ideology.¹⁴ Hofstadter defines academic freedom as a synthesis “not only with free intellectual activity, but with an ethic of human relations and an ideal of personal fulfillment.”¹⁵ Hofstadter’s definition seems nearly synonymous with Ezra Cornell’s oft-cited and famous line, “I would found an institution where any person can find instruction in any study.” Professor Carl Becker in a 1940 address entitled “The Cornell Tradition: Freedom and Responsibility,” said Cornell’s tradition of freedom in part stems from Andrew Dickson White’s desire “to found a center of learning...emancipated from the clerical tradition and inspired by the scientific idea...”¹⁶ Indeed, Cornell’s unique nonsectarian status was made official in the university charter which states “persons of every religious sect or of no religious denomination, shall be equally eligible to all offices and appointments.”¹⁷

In the late 1860s there were a number of developments in which Cornell University took center stage. The publication of *Origin of Species* and subsequent scientific debate had reverberations in the academic world. Cornell’s founding in the middle of the controversy on evolution certainly influenced its early years. Its founding was also a notable development, as a nonsectarian institution with its pursuit of knowledge away from the traditional classical curriculum. In this paper I aim to focus on the role evolution and Darwinism played during Cornell’s early years. Already at its founding, the young university found itself at many crossroads: between the forces of traditional versus new, sectarian versus nonsectarian, academic freedom versus classical education. The debate over Darwinism, the development of Darwinian thought, and the personalities involved in the theory of evolution at Cornell were significant to other, broader debates present during the universities early era. Focusing on the evolutionary debate will shed light on the other debates.

In this paper I will first explore the controversial role of religion in the founding of Cornell. Next, I will describe how those notable scholars who developed Cornell’s scientific curricula influenced the teaching of evolution. I will then closely examine the instruction of biology and geology, mainly by looking at contemporary textbooks used

¹³ Rogers, 6

¹⁴ Hofstadter and Metzger, 366

¹⁵ Ibid.

¹⁶ Carl Becker. *Cornell University: Founders and Founding*. (Ithaca, New York: Cornell University Press, 1943), 194.

¹⁷ Ibid., 93

by the earliest university students, before examining evolution's role on student life.

The Founding and the Role of Religion

Any account of Cornell and evolution together would be incomplete without a discussion of the role of religion in Cornell's early years. Cornell's nonsectarian affiliation drew fire from religious Christians. Although "nonsectarian" is not synonymous with "atheist," many religious groups attempted to portray Cornell as an atheist university. According to university historian and Professor of Romance Studies Morris Bishop¹⁴, Andrew Dickson White maintained the Christian character of the university in the face of attacks from various Christian denominations.¹⁸ In his Inaugural Address on October 7 1868, White declared, "We will labor to make this a Christian institution – a sectarian institution may it never be."¹⁹ At the same event, Ezra Cornell declared "it shall be our aim, and our constant effort to make true Christian men..."²⁰

In an 1872 pamphlet, "The Cornell University: What it is and What it is not," White explained that "The Cornell University is governed by a body of Christian Trustees, conducted by Christian Professors, and is a Christian Institution as the Public School system of this State is Christian."²¹ Still, Cornell's charter rendered those with no religious affiliation eligible for office or appointment; yet, the attacks kept coming. In his autobiography, White described an episode in which a Cornell student left a revivalist sermon "thinking, doubtless, that his time would be better employed upon his studies" only to hear the preacher yell, "[t]here goes a young man straight down to hell!"²² According to Bishop, Cornell was a prime target for denominational attacks. In one visit, a Presbyterian told the university's vice president that "Cornell could expect no mercy from the churches until it should impose instruction in the dogmas of historical Christianity."²³

The sectarian attack on Cornell was fierce. The earliest graduating classes in their class books spoke frequently of the university's

¹⁸ Morris Bishop. (*A History of Cornell*. Ithaca, New York: Cornell University Press, 1962), 191

¹⁹ *The Cornell University: Account of the Proceedings at the Inauguration. October 7th, 1868*. (Ithaca, Cornell University Press, 1869), 9

²⁰ *Ibid.*, 4

²¹ Bishop, 191

²² Andrew White. *Autobiography of Andrew D. White*. Volume I. (New York: The Century Co., 1905), 405

²³ Bishop, 214

enemies.²⁴ The students' language gives the sense of an institution under siege from outside forces, a strange contemporary concept but to be expected in the late 1860s and early 1870s when faced with such harsh language. The *Northern Christian Advocate* accused Cornell students of being "raw recruits for Satan," the institution of being "Godless" and the faculty of such sins as atheism and petty crime.²⁵ The *Methodist Quarterly Review* trumpeted the end of the American civilization, citing the lack of religion in education as "one of the most serious errors of the day."²⁶

The great opponent of Darwin, Louis Agassiz, was not immune from attacks. The *Cornell Era* reported after Agassiz's death that his series of lectures on natural sciences and zoology were declared "dangerous" but by the very same men who had posthumously hailed him as a defender against Darwin!²⁷ The divisive climate during Cornell's early years even mistook Agassiz -- who had since relocated from Harvard -- as a supporter of the evolutionary theory the sectarians despised, despite the strong language against Darwin in his lecture. At a speech in memory of Agassiz, Professor Burt Green Wilder noted that attacks on the late naturalist as an "infidel" were of course unwarranted: "[Agassiz] did not deny that the Bible may be the Divine Word; he simply confessed his personal inaptitude for unraveling its mysteries...."²⁸ White related perhaps most ironic was the charge. A "perfidious minister" claimed that Agassiz was "preaching Darwinism and atheism" at Cornell,²⁹ a not uncommon view of Agassiz that continued well after this death.³⁰ If there were to be any individual at Cornell invulnerable from religious attacks, it ought to have been Agassiz. But the severe onslaught from these groups did not even spare this man of science, regardless of his anti-Darwinian views.

²⁴ The annual yearbook, *The Cornelian*, mentioned "enemies" in its three issues from 1871-73.

²⁵ Author and article title unknown. *Northern Christian Advocate*. November 3, 1870.

²⁶ Author and article title unknown. *Methodist Quarterly Review*. Volume XXXI, October 1879. p. 636

²⁷ *Cornell Era*. May 4, 1877.

²⁸ Burt Green Wilder. "Address." *Proceedings at the Unveiling of the Tablet to the Memory of Louis Agassiz, At Cornell University*. June 17, 1885. Ithaca, New York: Cornell University Press, 1885.

²⁹ Andrew White. *A History of the Warfare of Science with Theology in Christendom*. (New York and London: D. Appleton and Co., 1923), viii

³⁰ White, *Warfare*, 81.

The class of 1872, the first class to graduate after four years at Cornell, reminisced in their class history on Cornell's early reputation as a godless institution:

It was a "Godless college," though, forsooth, the majority of all persons connected with it in any capacity were much farther from deserving the reproach of irreligion than were the fanatics who uttered it. It was "opposing religion," because it did not employ the Bible as a textbook after the manner of the theological seminaries. It was "encouraging atheism" – by teaching the lessons drawn from nature's scriptures, written with fossils in the earth's crust. It was "accursed" and "immoral" – because it was unsectarian and under the thumb of no denomination, its President was not an ordained minister or a superannuated preacher, and its Faculty included men who stayed at home when it rained on Sunday, and never went to church when the sun shone.³¹

What role, then, did evolution play in the midst of this onslaught of denominational and sectarian opposition? If these attacks had the slightest semblance of truth, one would expect the faculty to at least teach evolution as undeniable fact. On the contrary, the university experienced quite the opposite in its earliest years under the Agassiz's direction, the foremost American scientist and naturalist but also a great opponent of Darwin's theory of evolution. In a time when religion was still important in education – indeed, Christianity's major role at Cornell was undeniable – the magnificent presence of Agassiz and his view on the creative design of species was not too unusual. From a scientific standpoint, however, Agassiz did not offer any additions to Darwin's theory, which by this point was increasingly accepted in academic circles. His presence during Cornell's formative years was an important contribution to the university.

Notable People

The personalities and magnetism of a select group of men shaped the tone and extent of evolution teaching during Cornell's earliest years. Among them was educational visionary and Cornell's first president, Andrew Dickson White, visiting professor Louis Agassiz, and Cornell's first professor of zoology, anatomy and neurology, Burt Green Wilder. These men, present from Cornell's earliest days, influenced the debate over evolution at Cornell from the very beginning.

³¹ Class Committee eds. *History of the Class of 1872 Cornell University: "The First Through Class." Historical and Biographical Records with Chapters on Various Aspects of Cornell History and Development by Members of the Class.* (Published by the Class Committee, 1925), 24

Though Andrew Dickson White was not a scientist, he did possess a clear bold view for scientific education at Cornell. In his autobiography, White described his experience at Yale, where science students were “relegated to a separate institution at considerable distance,” inferior to the classical students.³² His vision for Cornell placed equal studies at the forefront: students pursuing the sciences would not be put at a “considerable distance” from the others. The emergence of specialized sciences such as “more or less amorphous groupings of knowledge”³³ created the need for different departments.

It is not known whether White ever explicitly published his views on Darwin or if such a source actually exists. However, White’s support of the natural sciences department and the later teachings of evolution during his administration as president do not demonstrate any large-scale opposition to evolution. Donald Williams of the University of Florida speculated that White would have favored Darwin’s scientific method for the sake of knowledge, rather than his specific conclusions.³⁴ In addition, Walter Rogers alludes to a Darwinian, or Spencerian, notion about the university’s competitive free scholarships, in which White “saw conformity to the law of nature – the survival of the fittest.”³⁵ White’s own religious views were by no means atheistic and he wrote in his autobiography there has been a constant “need absolute, pressing, and increasing” for religion.³⁶ He was a devout Christian who believed in the Scriptural plan for salvation.³⁷

White’s experience in battling the sectarians over Cornell inspired him to first publish articles that later became a valuable two volume set entitled *A History of the Warfare of Science with Theology in Christendom*. In this book White expressed optimism that “Science, though it has evidently conquered Dogmatic Theology based on biblical texts and ancient modes of thought, will go hand in hand in Religion,” while also stressing a love for God.³⁸ It is remarkable that among those enemies of Darwin whom White cited in the book were his contemporaries and fellow university presidents, Rev. James McCosh of Princeton and Dr. Noah Porter of Yale. The very fact that White published an eloquent series on the subject demonstrates the extent to which notable Cornellians viewed the debate on Darwin. White’s

³² White, *Autobiography*, 341

³³ Rogers, 125

³⁴ Donald E. Williams. “Andrew D. White: Spokesman for the Free University.” (*The Quarterly Journal of Speech*. Volume XLVII No. 2, April 1961), 138

³⁵ Rogers, 93

³⁶ White, *Autobiography*, 568

³⁷ Rogers, 83

³⁸ White, *Warfare*, xii.

powerful *History of the Warfare* touched on the Darwinian debate with his own experience as a veteran of that very conflict.

Among the most important tenets of White's vision for Cornell was his desire to secure the greatest intellectual minds for Cornell. He expressed reluctance to even attempt to lure Louis Agassiz to Cornell because Agassiz had refused offers from Emperor Napoleon III of France, let alone a fledging upstate New York college. However, with great advice and tenacity White "was able to secure a number of bright, active, energetic young men" as professors and a few older men "whose experience and developed judgment seemed necessary in the ordinary conduct of our affairs."³⁹

One of those few older men was Louis Agassiz of Harvard. He was a consistent believer of the role of God in nature. His 1846 lecture, "The Plan of Creation, especially in the Animal Kingdom" was exemplary of his views. Agassiz's opposition to Darwin was strong. Despite Darwin's respectful letter to him back in November, 1859, enclosed with a first edition of the *Origin of Species*, Agassiz came out vehemently against the theory. In a review of *Origin of Species* in the *American Journal of Sciences and Arts*, Agassiz concluded that "the transmutation theory is a scientific mistake, untrue in its facts, unscientific in its method, and mischievous in its tendency,"⁴⁰ while earlier in the review Agassiz stated that Darwin's theories "have not made the slightest impression on my mind, or modified in any way the views I have already propounded..."⁴¹

It is noteworthy and almost ironic that in the optimistic environment of Cornell's first academic year, 1868-1869, when academic freedom and new ideas were being put forth, Professor Agassiz was the dominant scientific force on campus. That is not to say that Agassiz was an opponent of academic freedom; frequent attacks from dogmatic Christians are evidence of his own questionable support among the illiberal religious. But contemporaries lamented his resistance to evolution; his Harvard colleague Jeffries Wyman wrote to Professor Burt Green Wilder at Cornell in 1871, saying "[Agassiz] was just the man who ought to have taken up the evolutionary theory and worked it into a good shape, which his knowledge of embryology and paleontology would have enabled him to do. He has lost a golden opportunity, but there is no use in talking of that."⁴² Agassiz's charismatic personality impacted hundreds of students and townspeople, but his views remained stagnant against the

³⁹ White, 337

⁴⁰ Louis Agassiz. "Review of On the Origin of Species." (*American Journal of Science and Arts*. Ser. 2. July, 1860), 154

⁴¹ *Ibid.*, 143

⁴² Letter from J. Wyman to Burt Green Wilder, May 30, 1871.

Darwinian tide. Still, the man was known to be a deeply moral individual and Andrew Dickson White reminisced that one day Agassiz suddenly asked him who the professor of moral philosophy was to be, for “that is a far more important position than all the others.”⁴³ Also, Agassiz held the Ithaca area and its “natural laboratory” in high regard.⁴⁴ He wrote to his friend and colleague Henry Augustus Ward “I have been so much engrossed with the Geology [sic] of this vicinity that I have given all my time to its exploration.”⁴⁵

The feeling from the area townspeople and students was mutual toward the great naturalist, and his twenty lectures in the fall of 1868 were widely attended. Morris Bishop attributes the strength of Cornell’s natural science programs to the burst of inspiration from these lectures early in the university’s existence.⁴⁶ Among those in attendance was freshman W.H. Niles ’72. His notes, while not exact quotations from Agassiz, provide a thorough picture of the professor’s views on life and evolution as he taught them at Cornell. In the first lecture, on October 13th 1868, Agassiz discussed the general types of animals, which he divided into four classifications: Radiata, Mollusks, Articulates and Vertebrates. All of these were both part of a larger plan and followed their own individual plan, according to Agassiz. Indeed, his numerous allusions to a plan throughout his lectures indicated he believed that a supernatural planner or deity existed. Niles wrote: “During the lecture he said that animals which look nearly alike did not descend from a common ancestry at any time. That it had never been seen since the world began.” In the second lecture, Agassiz spoke of the presence of a Supreme Being: if all animals evolved from some lower life form, everything happened by chance without the hand of God, but in the course of his subsequent eighteen lectures, Agassiz spoke of lower and higher animals existing simultaneously. He also stressed the need to explore the fossil record and examine animals throughout geological history.⁴⁷

The sequence of lectures, which lasted from October 13 to November 24, seems to have paralleled the sequence of lower to higher organisms, according to his classification scheme. He followed the introductory lecture with descriptions of polyps, coral reefs, echinoderms, mollusks, gastropods, cephaloids, articulates, crustatia, insects, vertebrates and finally higher vertebrates ending on a triumphant note on the superiority of men, particularly white men. In his final

⁴³ White, *Warfare*, 70

⁴⁴ Bishop, 171

⁴⁵ Letter from L. Agassiz to H.A. Ward, November 20, 1868.

⁴⁶ Bishop, 172

⁴⁷ Notes of W.H. Niles. Burt Green Wilder Collection. Rare and Manuscript Collection. Cornell University.

lecture, Agassiz took great pains to differentiate between monkeys and humans, explaining that monkeys have four hands whereas humans have two hands and two feet. Perhaps most controversial to his ultra-religious detractors was the admission that “Man is truly bound up with animals but he is the highest and at the head of them all.”⁴⁸ Agassiz’s numerous allusions to a plan coincide with his sweeping claim that, as Niles wrote, “animals did not arise from one another from the lowest up but were formed independently of one another.” In the final lecture, Agassiz reiterated this point: “Animals did not arise from the nature of the earth.”⁴⁹

Reactions to the eloquent lectures were enthusiastic, with the notable exception of those who believed he was preaching “Darwinism and atheism.” The very first issue of the *Cornell Era* described the lectures as “peculiarly attractive by his fine command of our language, his rich foreign accent, and his miraculous, offhand drawings”⁵⁰ His final lecture was completed with a long, grateful applause, a “token of their satisfaction with his presence and their sorrow at his departure.”⁵¹ Another description of the lectures was related by Burt Green Wilder who, in a review of Elizabeth Agassiz’s biography of her husband, wrote that the lectures “not only aroused an interest in natural history which has never been lost, but also attracted wide spread attention, and thus, to quote an alumnus who heard them ‘did more for the growth and prosperity of the university than any one other thing.’”⁵²

Agassiz’s views on Darwinism were well known and in an 1885 speech, Wilder acknowledged the attacks on Agassiz from both theologians and evolutionists. He explained that Agassiz felt inadequate in attempting to discover the Bible’s mysteries and instead focused his energies on “the exposition of that other revelation of God to man, Nature.” In doing so, Wilder did not believe Agassiz was entirely successful, as evidenced by the widespread acceptance of evolution by this point. Agassiz was never able to reconcile the notion of a Creator with evolution, something Wilder said he was able to do “only when forced to decide for himself what should be said to earnest and thoughtful students.” Wilder expressed his wish that if Agassiz had accepted Darwin and provided an interpretation of nature with all his

⁴⁸ Ibid.

⁴⁹ Ibid.

⁵⁰ *Cornell Era*. November 28, 1868.

⁵¹ Ibid.

⁵² Burt Green Wilder. Review of *The Life of Agassiz* by Elizabeth Agassiz. *Cornell Review*. Nov, 1885, 93-102.

brilliance there would be very few detractors of science.⁵³ Before his 1873 death, Agassiz wrote to Wilder about Darwin's *Descent of Man* and mentioned that he and Darwin had no personal animosity. Still, Agassiz expressed his conviction that "time will be sufficient to sweep the delusion" and advised Wilder to not "[waste] your time in discussion upon the origin of species" but rather to study anatomy.⁵⁴

There is no doubt that Agassiz had a tremendous impact on thought and science in Cornell's early years. Andrew Dickson White wrote to Agassiz's son, Alexander, soon after the elder's death expressing the great influence Agassiz had on Cornell:

In few places is your father's memory more tenderly cherished than in this. He rendered us a very great service at the moment when we most needed it. His interest in this institution at its beginning and his course of lectures here had an effect both upon the governing body and upon the students which is still far from exhausted.⁵⁵

His contributions were not limited to a speech at Cornell's Inauguration, a course of twenty lectures or even the grand energy and dignity he injected into the young institution. Rather, among Agassiz's most visible legacies were two of his own star pupils, Charles Frederic Hartt and Burt Green Wilder, the latter serving on the faculty until his retirement in 1910. They carried on his tradition of scholarly research and inspiration for students but soon differed widely on his views concerning evolution.

Morris Bishop described Burt Green Wilder as a "legendary figure."⁵⁶ Agassiz had such a high opinion of him as a student, that he recommended Andrew Dickson White to hire him as Cornell's first professor of anatomy and neurology. To White, Wilder was not only an excellent teacher but also a dynamic and inspiring lecturer.⁵⁷ Waterman Hewett, in his *History of Cornell*, described Wilder as "one of the most active and influential representatives" of anatomy and neurology in the country.⁵⁸ While Agassiz made a tremendous impact during his semester-

⁵³ Burt Green Wilder. "Address." *Proceedings at the Unveiling of the Tablet to the Memory of Louis Agassiz At Cornell University*.

⁵⁴ Letter from L. Agassiz to Burt Green Wilder, March 27, 1871.

⁵⁵ Letter from AD White to Alexander Agassiz 7/24/1874

⁵⁶ Bishop, 83

⁵⁷ Autobiography, 363 volume 1

⁵⁸ Waterman Thomas Hewett. *The History of Cornell University in the Twenty-Five Years of Its Existence 1868-1893*. (Reprinted from *Landmarks of Tompkins County, New York* by John H. Selkrief, ed. Syracuse, New York: D. Mason and Co., 1894), 506

long visiting professorship, Wilder's long tenure as professor secured Agassiz's legacy of scientific enthusiasm at Cornell.

Albert Hazen Wright, a professor at Cornell for much of the first half of the twentieth century, wrote that Wilder sought truth in his work. Wilder "had a deep reverence for truth," an excellent complement to his reputation as a "thorough, inspiring teacher."⁵⁹ Though a pupil of Agassiz, Wilder diverged early on from his teacher's views on evolution. In a revealing article in the *Cornell Era*, Wilder discussed a new theory on the origin of species proposed by Benjamin Ferris. The concluding paragraph is most telling of Wilder's views. He noted the difference between Darwin and Agassiz, the former denying the existence of any plan in nature while the latter would find fault with the theory of "Specific Genesis," in which a species is created and never loses its identity. Wilder concluded that it is possible to strike a balance between the theory of "Derivation' of higher forms from lower, and at the same time retain faith in God, in His Word, in our own immortality and in the view that Nature is the manifestation of Divine ideas."⁶⁰ Wilder's adherence to this theory of specific genesis put him at intellectual odds with his mentor Agassiz, who remained a consistent believer in the immutability of species and the permanence of type.

He later refined his views on evolution. In an address entitled "Educational Museums of the Vertebrates" he noted that not only is any opposition to evolution "now nearly confined to the stubborn and ill-informed," but the vast majority of higher learning institutions teach it as truth. In combating the vestiges of dogmatism, Wilder proposed museums and listed a number of achievements at Cornell in that field.⁶¹ He did warn that any able museum curator would show not only facts supporting evolution but problems associated with it. Wilder also advocated the "intelligent study of nature," specifically by paying tribute to Darwin not with statues – like the one recently erected with great aplomb in London – but with museums.⁶²

Wilder's influence at Cornell cannot be exaggerated and whatever his initial views on evolution were, they were soon outclassed by his sincere desire to teach and discover the truth. Upon his 1910 retirement, Wilder received a number of tributes in print. One stated that

⁵⁹ Albert Hazen Wright. *Biology at Cornell 1868-1928*. Ithaca, New York, Publication Unknown, 1953.

⁶⁰ *Cornell Era*. April, 28 1871

⁶¹ Burt Green Wilder. "Address." *Report of the Ann Arbor Meeting of the American Association for the Advancement of Science*. New York Science Company. New York. September, 1885, 223.

⁶² *Ibid.*, 224

he had a “profound belief that the subject he was teaching was of supreme importance, and that the truth about his subject, as about every subject, was what was worth knowing,” and that this belief was actually the “guiding principle of his life.”⁶³

In 1893, a group of Wilder’s colleagues and former students joined to create a quarter century book in tribute to all the years of work and inspiration Wilder had poured into the university. In a speech transcribed into it, Theobald Smith ’81 pointed out the great changes in science particularly in the field of evolutionary biology. Smith praised Wilder, saying “your own course during this trying period has been entirely consistent, highly honorable to yourself as a man and very creditable to your biological instincts.”⁶⁴

Burt Green Wilder was by far the more famous of Agassiz’s two students to teach at Cornell. This was partly due to the lack of extensive papers left behind by Charles Frederic Hartt as well as his untimely death in 1878 due to yellow fever contracted in Brazil. The *Cornell Era* relates in one of its earliest issues an expedition of Hartt’s that went to Brazil to explore geological history.⁶⁵ A later issue published Hartt’s own plans for the expedition in which he dove into scientific detail but also explained a little of his educational philosophy: “The true way to teach Geology and Natural History is not simply to lecture to the student or to drill him with a text-book...He must go into the field and collect and observe.”⁶⁶ His teaching was inspiring: Orville A. Derby ’73 in 1899 wrote of Hartt’s presence in the classroom and stressed “his industry, patience and devotion served us as an example; his enthusiasm aroused us – we seemed to share with him his labor.”⁶⁷ Unfortunately, any more lifetime tribute to Hartt ceased at the height of his career because of his early death, one of the earliest blows to the university’s faculty.

The role of key individuals shaped the trajectory of natural history studies at Cornell and particularly in the case of evolution. One could even argue that Andrew Dickson White’s acquisition of Agassiz as a visiting professor had the most impact on Cornell’s evolution education; Wilder’s long presence would beget John Henry Comstock as another longtime professor. Besides these academic genealogies, there

⁶³ Simon H. Gage. “Retirement of Professor Burt Green Wilder.” *The Anatomical Record* Vol 5, No. 7. July 1911, 359

⁶⁴ Various Authors. *The Wilder Quarter-Century Book: A Collection of Original Papers Dedicated to Professor Burt Green Wilder*. (Ithaca, New York: Comstock Publishing Co., 1893), 13

⁶⁵ *Cornell Era*. December 12, 1868. 12/12/1868

⁶⁶ *Cornell Era*. June 1, 1870.

⁶⁷ G. U. Hay. “The Scientific Work of Prof. Chas. Fred. Hartt.” *Proceedings and Transactions of the Royal Society of Canada*. Ser. 2. Vol. 5. (Ottawa: James Hope and Son., 1899,) 159

was of course the great spirit and energy of Agassiz and Wilder who inspired countless thousands of Cornellians.

Instruction

The inspiring lectures by the exceptional faculty who taught Cornell's earliest students of science were just one aspect of how the students learned. The students' textbooks are another excellent source for examining their education. Contemporary debates over history textbooks in Texas as well as the continuing debate over biology textbooks and the role of intelligent design continue to demonstrate the importance of textbooks and their views.

The 1868-69 *Register* lists the four "schools" in the "College of Natural Science:" Botany, Geology, Zoology, and Physical Geography. Entrance into the college depended on a student's knowledge of physiology, modern languages, mathematics "as every well educated man should know," as well as some classical languages like Latin and Greek.⁶⁸ A four year degree required laboratories, lectures, excursions, dissections and, of course, reading. The reading lists for the four schools included famous names such as Asa Gray, Louis Agassiz, Charles Lyell, editor of the *American Journal of Sciences and Arts*, James Dwight Dana, Francis Dalton and Sir Richard Owen. Charles Darwin was notably absent from the reading lists.

Charles Lyell's important and seminal work, *Principles of Geology*, was first published in 1830. Darwin took the first volume with him on his famous voyage on the HMS *Beagle*, and had later volumes shipped to him.⁶⁹ It was not until the tenth edition, published in 1867, that Lyell accepted the evolutionary conception of the history of life; unfortunately the *Register* does not specify which of the editions to read for the course. In an 1859 letter, Darwin called Lyell his "Lord High Chancellor in Natural Science," speaking to the high regard in which Darwin held the geologist.⁷⁰ Lyell's book was heavy in dense scientific jargon on the earth's geology but it was not devoid of Lyell's own view of the role of God. In the conclusion of the third volume, he wrote "in whatever direction we pursue our researches, whether in time or space, we discover everywhere clear proofs of a Creative Intelligence, and of His foresight,

⁶⁸ Cornell *Register* 1868-69, 76

⁶⁹ Michael Ruse. *The Evolution Wars: A Guide to the Debates*. (New Brunswick, New Jersey: Rutgers University Press, 2001), 34

⁷⁰ Letter from C. Darwin to C. Lyell. September 30, 1859.

wisdom and power.”⁷¹ Further on in the conclusion, Lyell wrote that despite humanity’s best efforts to study the natural sciences, it is ultimately limited, and any guesswork “appears to us inconsistent between the finite powers of man and the attributes of an Infinite and Eternal Being.”⁷²

Sir Richard Owen’s large *The Anatomy of Vertebrates* was more relevant to the topic of evolution. The book was an excellent complement to Agassiz’s lectures and his beliefs in the immutability of species; Owen wrote in the preface that the purpose of dissecting an organism from any species is simply to learn about its structure “without references to or comparison with any other, its species being regarded as standing alone in creation.”⁷³ Also, studying the parts and organs of an animal is “to indicate the direction and degrees in which organization, in subserving such Will, rising from the general to the particular.”⁷⁴ The content of *The Anatomy of Vertebrates* mirrors Owen’s doctrine; he focused on what animals *are* rather than how their features came to be. Owen’s own views rested on his belief in the “orderly succession” or “progressive” movement of species, which stems from the unity of a plan.⁷⁵ Despite his best efforts, he admits ignorance in attempting to discover this natural law but believes it is “operation in the production of species ‘in orderly succession and progression.’”⁷⁶

In his preface, Owen also discussed the new theories of Lamarck, Wallace and Darwin, all of which he criticized not only as theories focusing on species that “may have” originated but also as “powerless to explain” differences between species.⁷⁷ He concluded that these three individuals’ theories are “hypothetical” and the result of merely “guess-endeavor(s).”⁷⁸ In the conclusion Owen belittled them as “less applicable, less intelligible” in regards to horse molars than are his own beliefs in natural law. Perhaps Owen’s most revealing view on Darwin is a note in the conclusion that refutes contemporary reviews (and Darwin’s own letters) that Owen supported Darwin’s theory. Instead, Owen clarified in *The Anatomy of Vertebrates* that the section

⁷¹ Charles Lyell. *The Principles of Geology: Being An Attempt to Explain the Former Changes of the Earth’s Surface by Reference to Causes Now in Operation*. Volume III. First Edition. (London: John Murray, 1833), 384

⁷² *Ibid.*, 385

⁷³ Richard Owen. *On the Anatomy of Vertebrates. Volume I: Fishes and Reptiles*. (London: Longmans, Green and Co., 1866), vi

⁷⁴ *Ibid.*

⁷⁵ *Ibid.*, xxxvi

⁷⁶ Richard Owen. *On the Anatomy of Vertebrates. Volume III: Mammals*. (London: Longmans, Green and Co., 1868), 789

⁷⁷ Owen, *Anatomy of Vertebrates Volume I*, xxxv

⁷⁸ Owen, *Anatomy of Vertebrates Volume III.*, 785

indicating where Darwin and he apparently agreed – the conception of survival of the fittest – stemmed, in fact, from Owen’s own theory in 1850 on the “struggle for life.” According to Owen, Darwin only wrote that Owen supported him because Owen was supporting his own pre-*Origin of Species* idea that was similar to Darwin’s ideas published in 1859. Owen wrote that Darwin “failed to explain the origin of species on my basis of the ‘struggle for life’” and in this failure did not “attribute...the only reasonable and probable grounds for belief in the origin of species through a preordained continuously operating secondary law or cause.”⁷⁹ The word “preordained” is striking in this context because it again alludes to some sort of higher plan.

Another textbook was Louis Agassiz’s *Essay on Classification*. As mentioned, Agassiz was no fan of Darwin so it is telling that students used his book as a textbook. His biographer claims that as evolution became more widely accepted, Agassiz became more dogmatic in his beliefs.⁸⁰ Therefore, perhaps he assigned his own book for Cornell’s first generation to expose them to his views. He wrote that all of natural history comes down to “the analysis of the thoughts of the Creator of the Universe, as manifested in the animal and vegetable kingdoms, as well as in the inorganic world.”⁸¹ He also claimed that the geographical distribution of animals and plants “show the omnipresence of the Creator.”⁸²

Student Life

The experience of the average student is another way to gauge the extent of influence that evolutionary theory had during Cornell University’s early years. Between the Ithaca winters, lack of extensive facilities and the arrival of co-education, it is unlikely that the debate over Darwin’s theory took center stage in the late 1860s at Cornell. However, there were a number of developments that, surprisingly, showed the spotlight on evolution. First, of course, were the fierce controversies that arose over Cornell’s nonsectarian affiliation. Specifically, the claims from the ultra-religious that Cornell was teaching Darwinism (ironically, especially from Agassiz) put evolution in the public eye. For the average student, Cornell’s respect for religion was manifested only in a non-compulsory, nondenominational setting that exists today as Sage Chapel. One historian framed this development as breaking new ground: “Cornell

⁷⁹ Ibid., 800

⁸⁰ Louis Agassiz. *Essay on Classification*. Edward Lurie, ed. (Cambridge, Mass: Harvard University Press, 1962), xxxi

⁸¹ Ibid., 137

⁸² Ibid., 136

was notable for pioneering with the innovation of an interdenominational pulpit made up of guest preachers.”⁸³

Second, student organizations that centered on natural history arose. The most notable was the long-lived Natural History Society and its successors like the Agassiz Club and the Jordani Club. The Natural History Society lasted from 1869-1899 and exists for posterity in an extensive, detailed history by former professor Albert Hazen Wright. It was first noted in a list of student organizations in the *Register* for the 1869-70 academic year, listing twenty students and all natural science faculty *ex officio*. In the *Cornell Era*, the club announcement proclaimed, “[t]he Society purposes to work up the Natural History and Geology of Ithaca, and to obtain specimens, etc. from other parts of the United States.”⁸⁴ A later announcement in the same publication expressed pleasure at the growth of its membership and the enthusiasm of its members but simultaneously stressed the need for a practical pursuit of science. The announcement also expressed appreciation for the faculty’s gusto in helping to establish the society.

In an interesting announcement in 1869, the society stated that “notwithstanding the hopes of its enemys [sic], the fear of its friends, and the indifference of neutral parties, we are happy to inform all who may be interested in its success that [we have] safely passed the inevitable crisis.”⁸⁵ The announcement does not elaborate on what the crisis was, but we can speculate, considering the nonsectarian debate raging at Cornell and the tone of other student publications (like the annual class book) toward “enemies,” that the crisis involved some sort of opposition to the club based on its interests. The club survived and actually thrived. Its membership rosters included such luminaries as David Starr Jordan ’72, the first president of Stanford University and president of the Natural History Society from 1871-72, and John Henry Comstock ’74, vice president from 1872-73.

The minutes of the club and its annual schedules do not directly touch on Darwinism but there is no doubt that the contemporary evolutionary debate was present in the club’s activities. Their activities included excursions and lectures; one of the latter given by Professor C.F. Hartt in 1874 was entitled “The Evolution of Ornament.”⁸⁶ Although the Natural History Society itself ended in 1899, it lived on under many guises and continues on in the early twenty-first century under the dozens of organizations and programs in various departments. As one historian

⁸³ John Brubacher. *Higher Education in Transition: A History of American Colleges and Universities, 1636-1968*. (New York: Harper & Row Publishers, 1968), 125

⁸⁴ *Cornell Era*. March 13, 1869.

⁸⁵ *Cornell Era*. May 29, 1869.

⁸⁶ *Cornell Times*, 3/11/1874

stated, by 1900 “Cornell was the bustling headquarters of hundreds of nature-study clubs, issuing a steady stream of pamphlets, leaflets, and periodicals.”⁸⁷

Third, student life was directly influenced by evolution in the classroom. Besides textbooks and beliefs of the professors, we can get a sense of a student’s education from their own words. In its class history, the class of 1872 noted that, although Darwin was not yet a common name among students in 1868, the natural features of the Ithaca area was an “excellent ground for sprouting the seeds of Darwinism.”⁸⁸ Perhaps most revealing of the average student’s education was the statement that, in Agassiz’s lectures, sat some “young men, who had been studying evolution and thought they understood it pretty well...” and with this knowledge peppered the great naturalist with questions that sadly “did not turn out to be the bombs they had taken them for.”⁸⁹ In this class history, the very first four-year class of Cornellians admitted that they had studied evolution. Remarkably, they successfully studied this despite Agassiz’s overwhelming presence, religious opposition and the overwhelming opposition to Darwin in contemporary textbooks.

Conclusion

Today names like Comstock and Bailey - members of the second generation of faculty to shape evolutionary thought at Cornell - still ring across campus because their namesakes are forever enshrined as campus buildings. Lesser-known is the brain collection of Burt Green Wilder in Uris Hall. But there is no Agassiz Hall or Agassiz Brain Collection. Many students and teachers today do not realize the foundation of Cornell’s scientific accomplishments originate from the inspiration garnered from this man. His academic legacy and those of his academic successors are far-reaching and exist to this day.

David Starr Jordan in 1923, over a half century after his graduation from Cornell, wrote about Agassiz’s legacy, saying that Agassiz had little tolerance for “prejudices exploited by weak and foolish men in opposition to Darwin’s views.” Instead, Agassiz believed in the “absolute freedom of science.”⁹⁰ Jordan praised Agassiz’s inspiring call to think independently. Free academic thought was a crucial component of early Cornell in a time of sectarian affiliation in institutions of higher

⁸⁷ Lawrence Cremin. *The Transformation of the School: Progressivism in American Education 1876-1957*. (New York: Alfred A. Knopf, Inc., 1961), 77

⁸⁸ *History of Class of 1872*, 24

⁸⁹ *Ibid.*, 28

⁹⁰ David Starr Jordan. “Louis Agassiz, Teacher.” *The Scientific Monthly*. (Vol. 17, No. 5, Nov. 1923), 407.

learning. An independent scientific curriculum away from traditional classical studies found a welcome home at the fledgling New York college. While Agassiz opposed Darwin until his dying days, his pursuit of science and knowledge earned him the ire of the religious community and the eternal respect of the Cornell community. His legacy exists today not in a buildings or statues but in the academic spirit he instilled at Cornell. At the official university inauguration, Agassiz gave a speech in which he praised the free pursuit of study; “the University is free from these impediments” of strict classical study.⁹¹ He triumphantly pronounced “that today a new era for public education opens, and that, henceforth, the name of Cornell will stand in history as one of the greatest benefactors, not only of America, but of humanity.”⁹² These strong words became fact because of so many great minds, many of which were related to his.

Ironically, his advocacy that “the teacher will come before his class with his own thoughts, with what he brings in his head rather than in a stereotyped print”⁹³ quickly led to the end of Agassiz’s nascent anti-evolution legacy at Cornell. Despite his tremendous presence at the beginning of the university, textbooks that ultimately deferred to God and a continued Christian character at the school, evolution took firm hold in Cornell’s academic circles. Professors Wilder, Hartt, Comstock and Bailey took hold of Darwin’s ideas and fused them with Agassiz’s stress for science and independent thought. By the time Cornell entered the twentieth century, Andrew Dickson White could safely write that “all opposition had availed nothing; Darwin’s work and fame were secure. As men looked back over his beautiful life – simple, honest, tolerant, kindly – and thought upon his great labors in the search for truth, all the attacks faded into nothingness.”⁹⁴

In the end, we can conclude that Cornell occupied a special place and time that allowed evolution to take hold from nearly the very beginning of its existence. No one university had the foremost opponent to Darwin present at its founding; yet no other university had such a grand presence advocating for such noble ideas as the pursuit of academic freedom. As time went on, the vitriolic attacks on Cornell from the dogmatic ultra-religious shifted from godlessness to the cumbersome “undifferentiationism.”⁹⁵ President White’s vision for “increased

⁹¹ *Inauguration Proceedings*, 32

⁹² *Ibid.*, 33

⁹³ *Ibid.*, 32

⁹⁴ White, *Warfare*, 84

⁹⁵ O.D. Von Engeln. *Concerning Cornell*. Third Edition. (Ithaca, NY: Cornell Cooperative Society, 1924), 183.

development of scientific studies”⁹⁶ and Cornell’s nonsectarian nature put the study of evolution in a favorable position. Along with a series of outstanding professors and curious students, the pursuit of evolution existed within the walls of McGraw, Morrill and White Halls and in the outdoors as part of the Natural History Society’s excursions. Cornell, then, was surely an ideal place “for sprouting the seeds of Darwinism.”⁹⁷

⁹⁶ White, *Autobiography*, 341

⁹⁷ *History of Class of 1872*, 24

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