

Evolution and the Dynamo: Henry Adams' Failure at Applying Scientific Theory to History

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A man born in the United States during the mid-1800s grew up in a time of turbulent change. He saw the United States divide and then reunite; he saw the emancipation of the slaves, and he was exposed to the Darwinian theory of evolution and the discovery of uranium. The world was changing fast for men of the 1800s. Most men could not understand or did not care about the changes taking place in their worlds. Henry Adams was not such a man.

Adams was born in Quincy, Massachusetts on 16 February 1838. He was the great-grandson of President John Adams, and the grandson of President John Quincy Adams. Adams' father, Charles Francis Adams, Sr., was a congressman. Adams grew up in a worldly household where men were expected to understand and talk about current events. Henry Adams absorbed his surroundings and tried to create for himself an order out of the apparent chaos of his time. He looked to the past for continuity and explanations about America during the latter half of the 1800s. Adams was so desperate to find some kind of order in the external world that he turned to natural science. Adams applied scientific theories to history to derive laws from the past in order to explain the present.

Adams' two major historical works were *The History of the United States During the Administrations of Thomas Jefferson and James Madison* and *Mont-Saint-Michel and Chartres*. In each historical study, Adams tried to find the laws governing society. Adams used an evolutionary theory of history in *The History of the United States* and a dynamic theory of history in *Mont-Saint-Michel and Chartres*. His evolutionary theory was based on a cause and effect relationship in which the superior entity would survive. Adams' dynamic theory of history was founded on the idea that society was ruled by forces that were normally in equilibrium; if a new force entered into a society it would destroy the equilibrium. After the equilibrium was destroyed, society would be in a time of great change until the forces balanced each other out and formed a new equilibrium. When the evolutionary

scientific philosophy failed Adams, he was forced to look for a new philosophy, the dynamic theory of history. This paper will discuss the influences which drove Henry Adams to form an evolutionary theory of history and then a dynamic theory of history, how he applied each of these theories to his historical writings, and why he ultimately believed that both scientific theories of history failed.

Henry Adams' education in grade school and at Harvard had little influence on his philosophy of history. Although Adams studied the political and economic philosophies of Karl Marx and the positivist theories of Auguste Comte, he conceded that he was ignorant about what he had learned. In *The Education of Henry Adams*, Adams admitted about Harvard, that, "The entire work of the four years could have been put easily into the work of any four months in after life."¹

Adams' "after life" consisted of two years of schooling in Germany where he studied Civil Law. Just as he rejected the education he received at Harvard, he rejected the education he received at the University of Berlin. Disillusioned by formal education, Adams withdrew from the University of Berlin to learn the German language at a German high school, the Friedrichs-Wilhelm-Werdersches Gymnasium. He learned the language although he did not master it. He knew of the theories of Immanuel Kant and Georg Wilhelm Friedrich Hegel and the writings of Johann Wolfgang von Goethe and Johann Christoph Friedrich von Schiller, but he did not understand or sympathize with these men. Adams' formal education failed to give him a deeper knowledge of European and American society in the 1800s. This inability to gain an understanding of the society around him made him question whether he really understood himself.²

Feeling lost, Adams returned home to Quincy in October of 1860. His time in Quincy was short. He soon went to Washington to assist Charles Francis Adams, Sr., Quincy's representative to Congress. As his father's private secretary, Adams was exposed to

all of the treason and bribery that accompanied a nation in civil war. Daunted by the corrupted Washington society, Adams was quick to accept his father's offer to go to England.³

President Lincoln appointed Charles Francis as the American minister to Great Britain. Henry traveled with his father to London in 1861 and stayed on as his father's private secretary until 1863. It was in London that Henry was introduced to theories about biological evolution and the social theories that evolved from it. During his second stay in Europe, Adams discovered the writings of Charles Darwin, Sir Charles Lyell, and Herbert Spencer. Adams was also reintroduced to the works of Auguste Comte.

Charles Darwin had published his book, *The Origin of the Species*, in 1859. Discussion about Darwin's theory reached its height in England during the 1860s.⁴ Debates over the validity of biological evolution intrigued Adams. He looked upon Darwin's theory of evolution so favorably that he regarded himself as a Darwinist.

Adams combined his interest in Darwinism⁵ with his understanding of Auguste Comte's positivism. Comte was a sociologist who believed that, "by applying the natural methods of science to history," it would be possible to "discover the laws of historical development and thus foretell the future."⁶ Adams embraced the "positivist belief that science could explain the universe through all-embracing laws."⁷ After Adams read about how Herbert Spencer applied Darwin's evolutionary theories to human society, he believed that he could use Darwin's theories of evolution as a "stepping-stone towards a universal system that would make history scientific."⁸

Enamored with an evolutionary approach to history, Adams wrote to his brother, Charles Francis, Jr., from London to explain that what the United States needed was a "rational set of young men, like ourselves or better, to start new influences not only in politics but in literature, in law, in society, and throughout the whole social organism of the country—a national school of our own generation."⁹ Adams wanted rational young scholars to go abroad and learn about Darwin, Spencer, and Comte, and then form a "scientific school" in the United States.¹⁰

In 1870, Adams returned to Boston with all the knowledge that he had gathered from abroad and applied it to teaching at Harvard. Harvard hired Adams as an assistant professor of history. It was his duty to fill the space between Ephraim Whitman Gurney's courses in classical history and Henry Warren Torrey's modern courses.¹¹ This meant that Adams was assigned to teach medieval history, an area about which he claimed total ignorance. His lack

of knowledge, however, did not discourage Harvard's President, Charles Eliot, from offering Adams the assistant-professorship, because Harvard wanted Adams not for his teaching skill but his editing skills.

Along with his position in the history department, Adams was named editor-in-chief of the *North American Review*.¹² As editor, he was able to better familiarize himself with the works of evolutionists. He was particularly influenced by the evolutionary anthropologist, Lewis Henry Morgan. He believed that Morgan's greatest contribution to society and the field of anthropology was establishing a belief in Social Darwinism.¹³ Through the *North American Review*, Adams was able to share the writings of Sir Charles Lyell with the United States. Lyell was a geologist who promoted a uniformitarian theory of evolution. Lyell believed that organic and inorganic development occurred gradually and uniformly over a long period of time. The vision of history that Lyell defended in his book, *Principles of Geology*, was one "in which land masses gradually rose and fell, affecting climate and geology but always maintaining the delicate equilibrium that nature dictated."¹⁴ Adams believed that Lyell's observations provided the link between uniformitarianism and the evolutionary theory.¹⁵

Adams combined his understanding of the theories of Darwin, Spencer, Lyell, Morgan and Comte to form an evolutionary theory of history. Following Comte's teachings, Adams studied society in order to discover the law which governed the course of history. Adams studied society as Darwin studied the biology of animals, as Lyell studied geology, and as Morgan used anthropology to study social institutions. This work resulted in an evolutionary survey of American society between 1800 and 1815.

The nine volumes that formed *The History of the United States During the Administrations of Thomas Jefferson and James Madison* constituted Adams' first attempt at applying his evolutionary theory of history to historical writing. Spencer's evolution of human society gave Adams the scientific basis for centralizing and rationalizing a movement in American history. Adams used Spencer's theme of external organization to shape his work.¹⁶ He believed that all the facts must be collected in order to "help us understand how a nation has grown and organized itself."¹⁷ Adams attempted to gather all of the facts surrounding the events between 1800 and 1815. He compiled information such as the number of births, deaths, suicides, divorces, and cases of insanity, provided by the United States Bureau of Statistics.¹⁸ He combined this evidence with newspaper accounts, economic reports, books of

travel, memoirs, and letters to fashion order out of the apparent chaos of the early 1800s.¹⁹ When Adams believed that he had collected all of the facts, he assumed that he could "find then the corresponding delineations of succeeding ages . . . how each belief, institution, custom and arrangement was modified; and how the *consensus* of preceding structures and functions were developed into the consensus of proceeding ones."²⁰ Before writing *The History of the United States*, Adams also studied the facts of history in order to see the general mechanical principles of rigid causality that would lead him to determine a law which would explain the past and predict the future.

Over the nine volumes of *The History of the United States*, Adams covered the political aspects of the administrations of Thomas Jefferson and James Madison along with the physical and economic conditions of American society in 1800, the problems that hampered Anglo-American relations, the ramifications of diplomacy which resulted in the War of 1812, the military, political, and diplomatic actions during the War of 1812, and how all of these forces combined to shape the society of 1815. Adams successfully showed how American beliefs, institutions and customs evolved over the period between 1800 to 1815, but he used his evolutionary theory most convincingly in his discussions about military affairs during the War of 1812.²¹

For almost every military engagement, Adams provided authoritative reports from both sides, along with the number of men engaged, the reserves, the number of men killed and wounded, and the number and character of the artillery.²² Adams used statistical calculations to prove why one side should victor over another, thereby supporting Spencer's theory of the survival of the fittest.²³ In the account of the engagement between the American "Wasp" and the British "Frolic," in *The History of the United States*, Adams compared the ships' length and weight, the number of crew, and the strength of the armaments, in order to determine which ship was the superior ship and should therefore survive the battle. In this case, Adams concluded that the ships were fairly matched and the reason the "Wasp" triumphed over the inferior "Frolic" was because the crew of the "Wasp" were superior marksmen.²⁴ Adams believed that his retrospective analysis of the engagement provided proof for the evolutionary law of survival of the fittest because the superior "Wasp" triumphed over the inferior "Frolic."

After completing *The History of the United States*, Adams saw the faults in creating a scientific theory of history based on evolution. Indeed, a pattern of cause and effect relationships could be seen throughout history and usually the superior entity

triumphed over the inferior entity but there was no single definitive law to determine these historical relationships. In a letter written to Francis Parkman on 21 December 1884, Adams explained that "for all the science of his analysis, he could not escape the contradictions and dilemmas of the effort to harmonize mechanical evolution."²⁵ Evolutionary history had failed to provide Henry Adams with the general principles or laws by which he could predict the social phenomena of human behavior; thus Henry Adams went in search of a new theory.

In 1894, Adams was elected president of the American Historical Association. His presidential address, given to the association in absentia, was entitled "The Tendency of History." In this address, Adams argued that four out of five serious history students desired to discover a great generalization that would reduce history to a law much like the laws that govern nature.²⁶ Citing, for example his failure with evolutionary history, Adams warned his colleagues that, "Any science of history must be absolute, like other sciences, it must fix with mathematical certainty the path which society has got to follow."²⁷

After abandoning his attempt to subordinate history to an evolutionary theory, Adams looked for an absolute theory from which he could predict the behavior of society with mathematical certainty. Adams was not the first man to try to mathematically predict the functions of society. "The French mathematician Pierre LaPlace had postulated that the past could be re-created and the future predicted by one armed with the knowledge of Newton's law of motion and accurate calculations of the present position of the material bodies in the universe."²⁸

Willard Gibbs was the closest thing to Sir Isaac Newton that the United States in the 1890s could provide for Adams.²⁹ Willard Gibbs was a Yale physicist made famous by his phase rule. Gibbs first introduced his phase rule in his book, *The Equilibrium of Heterogeneous Substances*, published in the 1870s. By the time Adams learned of the phase rule in the 1890s, it had already become the foundation of the law of thermodynamics. The phase rule explained that the number of variables, for example, temperature, pressure and volume, must be specified in order to maintain a state of equilibrium. If all of the variables are at their equilibrium, then the three phases of water—water, ice, and steam—can exist simultaneously in the same system. If the equilibrium of the variables changes for any reason then only one or two of the phases can exist at once. Adams ignored the other parts of Gibbs' phase rule and focused on his explanation of the conditions and nature of the phase transitions.³⁰

Before Adams' historical application of the phase rule can be discussed an explanation of Adams' visit to the Paris Exposition of 1900 is necessary. Samuel Pierpont Langley, a physicist from the Smithsonian, showed Adams for the first time the Hall of Dynamos. It was in the Hall of Dynamos that Langley introduced Adams to the idea of forces. Adams was shown, first hand, the force of the steam-engine, the sun, heat, and coal.³¹

For Adams, the master symbol of the powerful new forces was the dynamo, which he first encountered at the Paris Exposition. The dynamo generated extraordinary amounts of electric power while scarcely humming an audible warning; its murmuring bulk expressed with ultimate energy—a new kingdom of force that was more powerful than the men entrusted to govern it.³²

If the dynamo, a mechanical steam-engine created by man, could have so much force over man, then Adams believed that history had other forces, forces that man did not create, and that these had equal or greater energy over man.

Adams wanted to reduce all of the forces to a common numerical value in order to discover what truly drove human society. The only problem with finding the "common value" was that, "This common value could only be measured by the degree of attraction in one's own mind." Adams did not feel discouraged because he could not find a mechanical formula by which to measure the effect of forces on man because he discovered experiments by Marie Curie, Wilhem Conrad Rontgen, and Michael Faraday, at the Paris Exposition, which suggested the existence of forces which could not be mechanically measured.³⁴ To compensate for the lack of mathematical measurement in his dynamic theory, Adams encouraged historians to follow carefully the track of the force or energy and discover, where it came from and where it went.

The only difficulty Adams had with his emerging dynamic theory of history was that his new theory progressed by leaps rather than by a gradual evolving movement. Adams explained how he accounted for the dynamic leaping movement of history by applying Gibbs' phase rule, to his essay, "The Rule of Phase Applied to History." According to Adams:

We know that, in history, thought may be conveniently studied as a current form, of historical sequence. We know only too well that thought has inertia, since it always obstinately resisting deflection by new motives, and that it has mass, because of the force it exerts. We know that it acts as though it felt the resistance

of friction, and that it is constantly stopped outright by obstacles that it may or may not overcome. We can by applying it, letter for letter, [to] one of the capital laws of physical chemistry that [states] where an equilibrium is subjected to conditions which tend to change it, it reacts internally in ways that tend to resist the external constraint, and to preserve its balance alone.³⁵

In this statement, Adams combined the force of mind, a force much like that driving the dynamo, and Gibbs' phase rule to form a new dynamic theory of history.

Adams experimented with his dynamic theory of history in *Mont-Saint-Michel and Chartres*. In this book, Adams focused on the architecture of three medieval French churches, Mont-Saint-Michel, Chartres, and Amiens, to enable him to depict to his readers the forces which governed medieval society.

The book begins with an account of the eleventh century church of Mont-Saint-Michel, or the church of Saint Michael the Archangel. According to Adams, eleventh century France was dominated by a masculine view of society. Adams explains how "the whole design is as beautiful a bit of early Gothic architecture as exists, but what would take the most time to study, if time were to spare, would be the instinct of the Archangel's presence which has animated his architecture."³⁶ With elaborate description, Adams shows how, "The masculine, military energy of Saint Michael lives still in every stone. The genius that realized this warlike emotion has stamped his power everywhere, on every centimetre of his work; in every ray of light, or the mass of every shadow . . . the architect intended it all."³⁷ Just as the eleventh century architecture of Mont-Saint-Michel was dominated by the masculine body of Saint Michael the Archangel, the twelfth century was dominated by an equally influential feminine being.

From Mont-Saint-Michel, Adams took his readers through Normandy and the Ile de France to Chartres. In the following chapters, Adams toured Chartres "towers and portals, its roses and its apse, its marvels of glass and its meanings of legendary windows, its nave, and the church's grand significance as the Virgin's palace court."³⁸ Adams explains all of these fixtures with grandiose descriptions in order to convince his readers the popular dominance of the Virgin Mary in twelfth century medieval Catholicism. Not only could Mary's presence be seen in the architecture of the Church but also in local history and-laws.³⁹

The Virgin's reign over the Catholic Church and twelfth-century French society ended with the onset of reason and the teachings of Saint Thomas

Acquinas. The last three chapters of *Mont-Saint-Michel and Chartres* focused on Aquinas' influence over the thirteenth-century Church. Adams showed how the beauty of Amiens could never compare to the majestic scenes in *Mont-Saint-Michel and Chartres*, because Mont-Saint-Michel and Chartres were built out of love and faith while Amiens was built with the reason and logic of Saint Thomas Aquinas.⁴⁰ Aquinas believed that God was order, unity, and law.⁴¹ Aquinas' architecture reflected these three fundamental principles, but it lacked the grandeur of the great cathedrals of the eleventh and twelfth centuries.

At the end of *Mont-Saint-Michel and Chartres*, Adams explains why Saint Thomas Aquinas' force of reason failed to have the same force as the Archangel or the Virgin. Adams warned that if we lose the faith behind a force, we lose the force. According to Adams' dynamic theory of history, faith was the driving force behind each age. It was faith that allowed for the reign of Saint Michael the Archangel in the eleventh century and faith that allowed the Virgin Mary to pervade twelfth century France. It was also a type of faith in reason that allowed for Saint Thomas Aquinas to take the reign from the Virgin.

In *Mont-Saint-Michel*, Adams used a logical scientific format to explain history. Adams' dynamic theory of history explained why each era of French society acted as it did and how thought abruptly changed from one dominating force to another. Unfortunately, Adams' dynamic theory of history

lacked as much of a scientific basis as his evolutionary theory of history.

In the *History of the United States* and *Mont-Saint-Michel and Chartres*, Henry Adams tried to apply scientific theories to history. He based both his evolutionary theory of history and his dynamic theory of history on the current scientific dogma of the time. In Adams' first theory, his evolutionary theory of history, he collected "in an apparently objective fashion a multitude of facts and then made a scientific induction or generalization within the limits of those facts."⁴² In his second theory, the dynamic view of history, Adams was "concerned primarily with ideas and generalizations, rather than the facts."⁴³ Each time Adams was attempting to formulate a law of history from the laws of science in order, ultimately, to predict the future; however, he failed both times.

One should not disregard Adams' work because his scientific theories of history failed. Formulating a scientific account of history is impossible, because a historian cannot conduct experiments to validate his work, social data is more complex than the material data used by scientists, physical phenomena tends to be constant while social phenomena changes between societies and eras. Also, scientists' data can be found within their time while most of the historians' pertinent data is lost beyond the point of recalling.⁴³ Scientific historians write sound history but the generalizations that they draw from their facts do not have the validity of law.

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Endnotes

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²Ibid., 77-81.

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⁴Keith Burich, "Stable Equilibrium is Death: Henry Adams, Sir Charles Lyell and the Paradox of Progress," *New England Quarterly* 65, no. 4 (1992): .

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⁷Paul J. Hamill, "Science as Ideology: The Case of the Amateur Historian, Henry Adams," *Canadian Review of American Studies* 12, no. 1 (1981): 26.

⁸Kraus, *History of American History*, 304.

⁹Ibid., 301, 321.

¹⁰Adams, *The Education*, 300.

¹¹Ibid., 293.

¹²Henry Hirsch Wasser, *The Scientific Thought of Henry Adams* (Thessaloniki, 1956), 47.

¹³Burich, "Stable Equilibrium," 635.

¹⁴Ibid., 638.

¹⁵Ernest Samuels, *Henry Adams: The Middle Years* (Cambridge: The Belknap Press of Harvard University, 1964), 358.

¹⁶Ibid., 363.

¹⁷Wasser, *Scientific Thought of Henry Adams*, 18.

¹⁸Samuels, *The Middle Years*, 365.

¹⁹Ibid., 363.

²⁰Ibid., 369.

²¹Ibid., 370.

²²Ibid., 369.

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²⁴Samuels, *The Middle Years*, 377.

²⁵ Keith Burich, "Our Power is Always Running Ahead of Our Mind: Henry Adams's Phases of History," *New England Quarterly* 62, no. 2 (1989): 164.

²⁶ Henry Adams, *The Tendency of History* (New York: The MacMillan Company, 1919).

²⁷ Burich, "Henry Adams's Phases of History," 166.

²⁸ Adams, *The Education*, 377.

²⁹ Burich, "Henry Adams's Phases of History," 166.

³⁰ *Ibid.*, 166-169.

³¹ Lears, "In Defense," 88.

³² Wasser, *Scientific thought of Henry Adams*, 19.

³³ Lears, "In Defense," 88.

³⁴ Burich, "Henry Adams's Phases of History," 176.

³⁵ Henry Adams, *Mont-Saint-Michel and Chartres* (Boston: Houghton Mifflin Company, 1904).

³⁶ *Ibid.*, 40.

³⁷ Henry Osborn Taylor, *Review of Mont-Saint-Michel and Chartres*, in *American Historical Review* 19 (April 1914): 593.

³⁸ Adams, *Chartres*, 260.

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⁴⁰ Wasser, *Scientific Thought of Henry Adams*, 33.

⁴¹ *Ibid.*, 12.

⁴² *Ibid.*, 12.

⁴³ *Ibid.*, 10.