Henry Adams' *Annis Mirabilis*: 1900 and the Making of a Modernist

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Annis Mirabilis is usually used in reference to the year 1666 when Sir Issac Newton formulated his principle of mathematics, mechanics and optics in a single creative impulse. The central assumption of Newton's "System of the World" was a rational, predictable universe governed by universal, immutable laws. By the beginning of the twentieth century, scientists following his lead had managed to extend Newton's laws of motion to all but a few intractable phenomena. It was in the initial year of that century that Henry Adams experienced a similiar revelation, but one that envisioned the disintegration of Newton's unifying principles into a world of chance, randomness and relativity. Adams' conclusions were not original, but he was prescient enough to recognize that the crumbling of the scientific system that had dominated the Western mind for more than two centuries was paralleled by the decline of the West's ability to control the forces it had unleashed with colonialism and imperialism. Adams predicted that the Western powers would engage in a desperate attempt to determine the course of history, much like the force of gravity determines the path of the comet, but the end result would be the destabilizing and ultimate decline of the West. What Adams was experiencing was a weakening of the faith that he had shared with other Victorians in humans' ability to control their environment and effect the continued moral and physical progress of humankind. Yet, even as he decried his personal failures and those of his generation and times, and proclaimed the death of Victorian morals and values, Adams found hope amidst the uncertainty and doubt of the new century, particularly in its science. Adams' willingness to explore and ultimately embrace the strange and forboding "multiverse" with

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which science had replaced the more comfortable Victorian "universe" marked his emergence as a modernist.

Ever since the publication of William Jordy's *Henry Adams: Scientific Historian* in 1952, Adams' efforts to develop a science of history have been viewed as the primal yawp of a failed patrician confronted with a world that did not and would not conform to his ideals or will.[1] Accordingly, when Adams was finally forced to admit that the simpler, predictable world of his youth had given way to the complex, chaotic multiverse of the twentieth century, he lashed out with his scientific theories that demonstrated humankind's inexorable decline toward a deadening equilibrium, much like the energy of the universe was dissipating toward an inevitable and irreversible "Heat Death." This degeneration of humans' creative energies in the name of democracy and bourgeois capitalism meant that humans would never again produce such monuments to their highest ideals as the cathedrals of the twelfth and thirteenth centuries. Rather than elevating the masses, Adams charged that western civilization had sunk to the level of the lowest common denominator.

If this interpretation is correct, then it would appear reasonable to assume that Adams did indeed turn to science to find a rigidly deterministic theory of history that pointed to humankind's irreversible decline. More important, his obsessive search for absolute answers to the riddles of history would surely place him outside the mainstream of modernism, which rejected determinism and absolutes in any form and reveled in the incomplete, unstable and paradoxical nature of experience.[2] Consequently, historians have denied him membership in the modernist movement despite, for example, Jackson Lears' admission that "In his restless experimentation with contraiety and process, in his refusal to rest content with unity or stasis, in his acceptance of a fragmented self in a fragmented universe, Adams prefigured the 'modern conciousness'. . . ." Adams' search for a unifying force to counter the "multiplicity" of the modern age, first in the architecture of the thirteenth century and then the laws of modern science, suggest that he could not bring himself to join in the "celebration of chaos" that characterized modernist thought. Lears could only conclude that Adams remained an "anti-modern modernist."[3]

Unfortunately, historians have relied almost entirely upon *Mont-Saint-Michel and Chartres* and *The Education*, and Adams' unfavorable juxtaposition of the twelfth and twentieth centuries in those two volumes to demonstrate his "anti-modernist" tendencies. While those works represent Adams most famous achievements, they are not a complete reflection of Adams' experiences after 1900, particularly his pursuit of a new "education" in the language and concepts of modern science. Although historians of modernism have acknowledged the impact of science on the modernist movement, Adams' essays on history and science, particularly his pessimistic predictions based on the Second Law of Thermodynamics, have been too easily dismissed as the prattlings of an aging cynic. As a result, historians have misunderstood the impact of modern science

on Adams in his later years and, consequently, his place in the modernist movement.

Whatever Adams' intentions in turning to science, he found a scientific community in a state of turmoil. By 1900 the uniform continuum that joined together all phenomena, past, present and future, in the Newtonian and Victorian universe had begun to dissolve into discontinuous and random processes. As early as the 1850s scientists began to realize that the laws of the rational or sensible universe did not obtain in the invisible realm. The kinetic theory of gases and especially the Second Law of Thermodynamics, as Adams perceptively discovered, made it clear even before the turn of the century that mechanical cause and effect relations did not govern molecular behavior. By 1900, with the discovery of radium and Max Planck's development of quantum theory, the Newtonian presumption of orderly laws linking all events to God or some other unattainable source of absolute knowledge was already seriously undermined. Although Einstein would raise the curtain on the absolute in 1905 and demonstrate that there was nothing behind it, mortal wounds had already been inflicted on the Newtonian universe by 1900.

Thus, when Adams turned to science, he was confronted with a universe in which simple, mechanical theories leading humans and nature along some necessary and predetermined path did not apply. And, if he was able to accept the anarchy of this new "multiverse" where the merger of the observer and the observed made futile humans' efforts to control it, then he could no longer be considered an "anti-modern modernist" lamenting the passing of the simple, innocent "universe" of his youth. Rather, he was part of the modernist revolution who understood that the chaotic world of the new science may have denied humanity the certainty upon which Newtonian science and Victorian society had proceeded, but it also offered an infinite number of possibilities for forging a "new synthesis." He also understood that a "new synthesis" would require the development of a new conciousness. It was to this end that Adams announced in 1900 that he was abandoning the history he had known and practised, because the "history and development of mechanical energy is now more exciting and important."[4]

I have shown elsewhere that Adams applied the new science to history in order to demonstrate that history was not a deterministic process, but a series of indeterminate, discontinuous, or "singular" events that could not be averted but, nevertheless, irreversibly altered the course of history.[5] However, Adams' penchant for protecting the privacy of his innermost feelings, whether through his use of the paradox or the third person singular, obscured his intentions in turning to science in the first place and, consequently, his contributions to modernism. In attempting to resolve the enigma surrounding his later writings on science and history, it occurred to me that the question of why Adams turned to science may best be answered by determining when he did so.

There were any number of "singular" years in Adams' life, in particular 1885 with the tragic suicide of his wife, but the year 1900 also qualifies as such. His

autobiography testifies to it. It was the year of the Paris Exposition where Adams found himself prostrate before the mysterious dynamos. It was the year that he first drew the analogy between the dynamo and the Virgin of Chartres, the two symbols with which Adams' name is synonymous. It was also a year of discontinuity; Adams had his "historical neck broken by the irruption of forces totally new."[6] For the remainder of his life, 1900 would symbolize the rupture between the past and the future. In 1900, both science and history seemed to have reached what Adams would later term a "critical point," and its significance in his life requires a re-examination of his thoughts and activities during that brief but seminal twelve-month period.

The Virgin and the Dynamo are associated with *The Education*, which Adams had privately printed in 1907, but he first revealed his experience in the Hall of Dynamos in a letter to John Hay in November 1900. At the time he wrote it he was "absorbed in the Beatitudes of the Virgin Mother," by which he meant that he was in the process of researching and writing *Mont-St.-Michel and Chartres*. In the midst of his studies on the twelfth century, Adams confessed to visiting the Exposition and sitting "by the hour over the great dynamos, watching them run as noiselessly and as smoothly as the planets, and asking them—with infinite courtesy—where in Hell they are going." The mysterious ability of the dynamos to create electricity out of coal and steam signalled to Adams the end of the rational universe of Newton with its predictable patterns of behavior that conformed to human experience, such as the motions of the planets which, after all, Newton had explained. As Adams wrote to Hay, "I can already see that the scientific theories and laws of our generation will, to the next, appear as antiquated as the Ptolemaic system. . . ."

The production of electricity by the dynamos was a technologic triumph indeed, but not one with which Adams was unfamiliar. His encounter with the dynamos at the Chicago World's Fair in 1893 sparked neither amazement nor an intense interest in science. Suddenly, in 1900, the world of electricity, and especially radioactivity, seemed irrational. The new universe may have appeared rational and predictable on the surface, but as Adams exclaimed, "The Gods are not in it." The world of the supersenuous exhibited neither the reason of God nor the logic of man. The revelation was shocking to scientists who would take decades to come to grips with the revolution in physics at the turn of the century, but it only seemed to amuse Adams. "The charm of the show, to me, is that no one pretends to understand even in a remote degree, what the wierd things are that they call electricity, Roentgen rays, and what not."[7] Charming or not, the fact that the new discoveries upset the scientific conventions of more than two centuries was not lost on Adams. And what made the revelations particularly poignant was their similarity to the historical events swirling around Adams and Hay in 1900.

Adams had always been more than just a casual observer in the events of his times, but the events of 1900 forced him to reevaluate his historical assumptions. It was the year of the Boer War and the Boxer Rebellion, two events that Hay, then Secretary of State, and Adams discussed thoroughly in their correspondence. In

a letter to Hay dated June 26, 1900, Adams suggested that the balance of power was in danger of being upset by the uprisings in what today would be called the Third World. Colonialism had unleashed forces that would require an enormous expenditure of resources to suppress. The Boer War had exposed the weakness and vulnerability of England, while Spain's empire had collapsed after a mere shove from the United States.

The Boxer Rebellion, caused by the plundering of China by Germany, France and Russia, posed an even greater threat for the Europeans. "Two hundred thousand Europeans were not enough to hold Cuba or the Transvaal. Englands' war-bill for her fun in South Africa cannot fall short of a thousand million dollars. How many men are needed to garrison the valley of the Yellow River?" Adams also worried that the rebellion in China would spread to "Persia and Central Asia and start off a general Mahometan outbreak...." Add to that the apparent decline of Russia and the emergence of Japan, which Adams later predicted would defeat Russia and cause the collapse of the European alliances, and any mathematical formula for predicting the direction of history after the turn of the century would necessarily consist of unknown variables.

Adams advised Hay that "politics is a matter of the conflict of forces. Forces are chiefly mathematics. What's the mathematical formula for the world now?" Adams was suggesting that any conflict would be decided by what he termed the "law of the sum of forces." The outcome of any political or diplomatic squabble would be determined by the total amount of force at the disposal of one side or the other. It was the desire to augment the force at their disposal that had led to the conquest and plundering of colonies across the world and the subsequent embroglios in South Africa and China. Adams suggested to Hay that an alliance that would resolve the difficulties in China was possible, assuming that Japan, France and Germany were cooperative, Russia and England not too weak, and the Asian people complaisant. But such assumptions involved too many unknown variables. Did the Europeans have the will and resources to maintain control over their empires? At that point, "we come back to the study of forces, and there we stick. Yu [sic] don't know more than Yu or than Li, for that matter; perhaps not so much." As he warned Hay, "you need pure mathematics for that, and, above all, you need to know the value of at least two fixed elements. I wish you may find 'em."[8]

Adams was expressing his concern about the conditions necessary to maintain an equilibrium between the competing forces in Europe and Asia. By requiring "at least two fixed elements," Adams may have been referring to the phase rule of the American physicist Josiah Willard Gibbs, which he would later apply to historical processes in the unpublished essay "The Rule of Phase Applied to History." Gibbs' phase rule stated that if two variables of a system were fixed, the value of the third variable needed to keep the system in equilibrium could be determined. Whether Adams was familiar with or understood Gibbs' principle in 1900 is not certain, but Adams clearly was warning Hay that he needed to determine the value of those unknown variables or forces at work in the world

before he attempted to establish a state of equilibrium in China or anywhere else. As he reminded Hay, the Open Door Policy that Hay had promulgated to keep China from being divided into warring European satrapies was "already off its hinges, not six months old."[9]

Obviously, Adams was not optimistic about Hay fixing the values of those unknown variables. Not only were the variables unknown, but the rules of the game itself had changed. Resistance to colonialism "used to be called liberty, but has now become anarchy, or resistance to civilization. . . ."[10] Adams had earlier reminded his English confidant Charles Milnes Gaskell that the British had no more right and probably less ability to suppress the Boers than they did to suppress his ancestors in Massachusetts.[11] In fact, as a "conscientious conservative anarchist," he sympathized with the Boers and the Chinese and other Asians in their "anarchy." He assumed that the "next man" would probably respond with even more force. But, if it were left up to him rather than Hay, he would "shut down" the engine rather than "put on steam" since it was already apparent that no amount of force would be sufficient to the task.[12]

Adams pointed to the disastrous consequences of Joseph Chamberlain's decision "to wreck the empire and himself in order to assert a nominal and futile supremacy over a wilderness in the remote interior of the planet Uranus" in pursuing the Boers.[13] With that Adams hit upon the central paradox of colonialism at the turn of the century. No matter how much energy was expended, the attempt by the Europeans to control the forces they had unleashed would ultimately prove futile, and any attempt to "put on steam" would have the same disastrous consequences he predicted for England. Coincidentally, he had also hit upon one of the central paradoxes of nature that scientists found so perplexing about the Second Law of Thermodynamics.

The Second Law stipulates that energy expended is unrecoverable and, as a result, the amount of energy available to perform work is continually and irreversibly diminishing. The adjunct principle of entropy is more famous and is the measure of the energy available for work or, more precisely, the measure of a system's disorder since energy must be in some ordered form such as coal to be usable. Adams found the Second Law to be a most convenient scientific metaphor for events at the turn of the century, and he would attempt to apply it to history in his "Letter to American Teachers of History" in 1910. Thus, energy spent to capture and control the forces of nature, whether in the form of humans or machines, would be irretrievably lost and contribute to the disorder of a system. This fact was already apparent to Adams in 1900 as the colonial powers unleashed forces in Africa and Asia that were uncontrollable and irreversible. Bringing them back under control would require greater expenditures of energy that would, quite paradoxically, only serve to bring Western civilization to the brink of destruction.

In light of these events at the turn of the century, it would seem quite natural for Adams to later associate them with the Second Law and entropy. However, the unexpected occurrences of 1900 also defied his efforts to derive a formula for

predicting the "curve" of history. Adams had calculated that history had changed course every thirty years in the nineteenth century, with the changes in direction occuring in 1830, 1860 and 1890. But from the perspective of 1900, the world had been so radically altered since 1860 that "The turning of a nebula into a star may somewhat resemble the change." These changes had been the result of the "compression, concentration, and consequent development of terrific energy, represented not by souls, but by coal and iron and steam." The impact of these forces on society had been so great that the normal progression of historical sequences had been disrupted. Consequently, the next term in his equation for the curve of history was "not 1920, but infinity."[14]

The point at which a curve defined by a mathematical equation becomes infinte is known as a "singularity." At that point the event or process described by that curve becomes discontinuous or, in other words, subsequent events are not dependent upon past events. Adams, suffering from an admitted lack of mathematical training, may not have understood the physical and mathematical implications of his equation ending abruptly in infinity. However, a few years later in *The Education*, he would confess that the dynamo became for him a symbol of infinity and discontinuity.[15] As he did with the Second Law of Thermodynamics, Adams would eventually stumble across a scientific explanation for these historical discontinuities, this time in the form of Gibbs' phase rule.

The phase rule defines not only the conditions for maintaining a state of equilibrium between the several phases of a substance as mentioned earlier, it also defines the point at which transitions occur between phases such as when ice melts, or water turns to steam. These transitions occur at a "critical point" when the mathematical curve defining a state of equilibrium becomes infinite or discontinuous. Such points are "singularities" and are obviously analogous to the abrupt changes Adams witnessed in 1900. Thus, by 1900 Adams had noticed certain tendencies in history for which he would later find scientific analogues in the Second Law of Thermodynamics and the phase rule of J. Willard Gibbs. In their absence, Adams would tinker with his equations and alter the length and frequency of the "phases" of history, but the idea that the each new "phase" was the product of a discontinuous change of direction produced by humanity's futile attempts to concentrate and control human and natural energies first occurred to him in 1900. All that was left was to scour scientific journals and texts for the most convenient theories to fit the circumstances, for "convenience is truth."[16] It was this task that would consume his own energies for the next ten years.

Meanwhile, scientists would scramble to preserve Newtonian mechanics and bar the doors against such heresies as relativity, while statesmen like Hay sought to "put on steam" to preserve European supremacy, despite such disasters as the Boer War and Russia's humiliating defeat at the hands of Japan. The universe that had always appeared so tame and benign, like the deceptively placid dynamos at the Paris Exposition, disappeared in 1900 as the irrational forces of humanity and nature bubbled to the surface. Indeed, the dynamos were the perfect

symbols for the contradictions and paradoxes in history and nature that Adams witnessed at the turn of the century.

On the one hand, the dynamos represented the triumph of technology over the forces of nature that Victorians were trumpeting at the Chicago World's Fair and the Paris Exposition. The transformation of the energy locked in a few tons of coal into the mechancial energy of the dynamo also symbolized the achievements of the mechanical theory of the universe in which all phenomena could be reduced to matter in motion governed by Newton's laws. On the other hand, the energy needed for the dynamos to produce electricity was irreversibly lost or wasted, while the electricity itself defied not only mechanical explanations but also man's logic, reason and conciousness. As Adams would later confess in *The Education*, "Between the dynamo in the gallery of machines and the engine house outside, the break of continuity amounted to abysmal fracture for a historian's objects. No more relation could he discover between the steam and the electric current than between the Cross and the cathedral... he could see only an absolute *fiat* in electricity as in faith."[17]

His friend and scientific mentor in Paris, Samuel Pierpont Langley, admitted that he was "worried by the same trouble, for he constantly repeated that the new forces were anarchical, and especially that he was not responsible for the new rays, that were little short of parricidal in their wicked spirit toward science."[18] Whether it was the Boers or the Boxers, or the rays and particles that troubled Langley, Victorians were confronted for the first time with a universe that was not amenable to their interests and would not conform to their reason or will. But for Adams, who sided with the forces of anarchy, the demise of the old system in science and politics was an opportunity to escape the conventions that he believed would soon destroy the civilization they were intended to preserve and protect.

Adams was certainly not alone in predicting the disintegration of the existing social, cultural and political systems. Indeed, such apochryphal warnings as filled Adams' correspondence in the 1890s were also prevalent among contemporary modernist writers who awaited the dissolution of the existing order, not with foreboding, but in eager anticipation of the new order that must inevitably arise from the chaos. Nothing short of the total destruction of the prevailing artistic, literary, historical and even scientific forms would ensure that the new order would represent a complete rupture with the past.[19] To Adams, the destruction of the old order would necessarily have to be complete, since it was totally without "foundation except so-called confidence."[20]

> "Europe is bankrupt and imbecile. Its wealth is a delusion, its science a fraud, and its art a mere shadow. The more I poke it, the rottener and more visionary all its stage conventions seem, and the more inevitable its quick and complete downfall."[21]

Adams blamed the impending cataclysm on the bankruptcy of the European economic system, which survived by beggaring thy neighbor through cut-throat

competition or, when that failed, plundering South Africa and China.[22] He predicted that even the collapse of so weak a power as Spain would produce a general collapse, but he disagreed with his brother Brooks that the sinking of the "Maine" was the end of the world.[23] Spain's defeat could trigger wholesale economic distintegration in Europe, which would lead to social revolution, but so what? Adams believed that revolutions had a revitalizing effect on society, and he pointed to Paris' revolutions as the reason for that city's intellectual diversity and vitality.[24] General collapse in the wake of Spain's defeat might also force America to shoulder its responsibilities and become the dominant center of civilization after the deluge.[25] Even Adams' subsequent use of the Second Law of Thermodynamics and Gibbs' phase rule reflected Adams' faith in the rise of a new order out of the chaos of destruction. Both are irreversible and discontinuous mixing processes that result in the creation of a new state or equilibrium out of the disintegration of an exisitng state or equilibrium. Like the revolutions Adams and other modernists expected at the turn of the century, they were creative processes that gave birth to new systems that were not dependent upon the past. According to Adams, such a revolution, however destructive, was necessary so that society could experience "the Passion, the Agony, the Bloody Sweat and the Resurrection."[26]

Another way of measuring Adams' modernist tendencies is to compare him to that symbol of Victorian smugness, Rudyard Kipling. In a poem entitled "Recessional" and written in 1897, Kipling attempted to revive the lagging spirits of his countrymen by invoking God's support for the Empire's enterprises.

God of our fathers, known of old,
Lord of our far-flung battle-line,
Beneath whose awful Hand we hold
Dominion over palm and pine...

Far-called, our navies melt away;
On dune and headland sinks the fire;
Lo, all our pomp of yesterday
Is one with Ninevah and Tyre...

If, drunk with sight of power, we loose
Wild tongues that have not Thee in awe,
Such boastings as the Gentiles use,
Or lesser breeds without the law—
Lord God of Hosts, be with us yet...

For heathen heart that puts her trust
In reeking tube and iron shard,
All valiant dust that builds on dust,

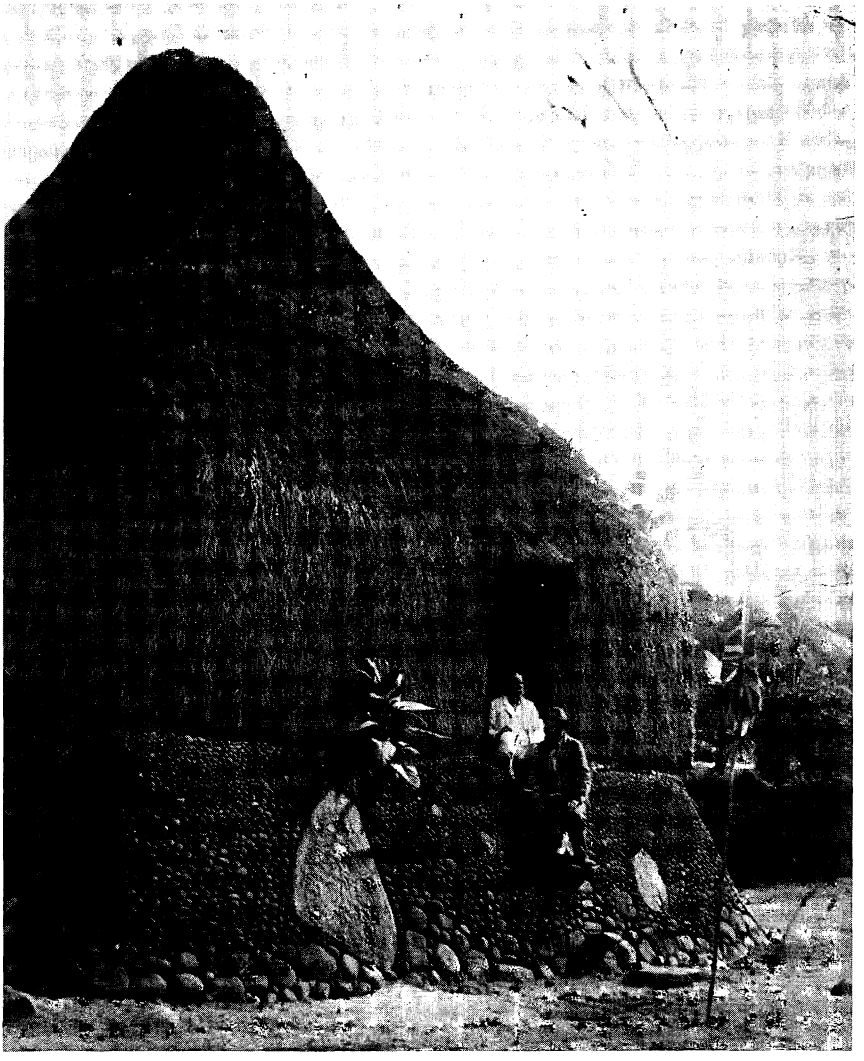
And guarding, calls not Thee to guard,
For frantic boast and foolish word—
Thy mercy on Thy People, Lord!

Like Adams, Kipling recognized that colonialism had unleashed "Wild tongues" and "lesser breeds" that defied the "Law" of God and civilization and respected only the force of "reeking tube and iron shard." As a result, Kipling admitted that the position of the British Empire was precarious and perhaps as temporary as "Nivevah and Tyre." However, unlike Adams, Kipling did not signal a retreat but called for the British to "put on steam" by returning to their faith in the "God of our Fathers" that had ordained their success.[27]

To Adams, it was precisely that faith in one god, one law, one civilization that had caused their failure. The belief that the mind and will of God and humanity were united in Western civilization was belied by the uprisings of the "lesser breeds without the Law," just as the rebelliousness of the molecules and radioactive particles belied Newton's laws. Adams sought a new god or, as he would phrase it in *The Education*, a "new synthesis" capable of encompassing the "multiplicity" or, better, the irrationality of the new universe that the twentieth century had wrought.

Adams was not disturbed by the failure of science or history to find a universal, deterministic theory of either man or nature. At odds with his country and times, he could sympathize with the "irrational" forces that seemed to defy the laws of God, science or civilization. From the time of his travels to Japan and the South Seas following the death of his wife, Adams found himself strangely attracted by the "depraved" and "licentious" but nonetheless "splendid" societies that had flourished until the missionaries introduced clothes and morals. He mournfully concluded that morals were a "European invention for no sooner were they introduced here . . . only about a century ago, than they swept away the entire population in fifteen or twenty years. Where vicious people swarmed, the virtuous scarcely exist."[28]

Later, on visits to Mexico, Cuba and various Carribbean islands, he confided that he felt more comfortable in a "world that is not sane."[29] Cuba was a "good, rotten tropical Spanish island" without the amenities or values of civilization, a fact that eminently pleased him. "Every time I come back to what we call civilized life, it bores me more, and seems to be hopelessly idiotic. . . ." The tropics, with their dark races and seemingly intractable immorality, represented the untamed and untameable forces of humanity and nature that threatened the hegemony of European civilization, a prospect that did not seem to trouble Adams. "I know that with our fatuous self-esteem, our newspapers admire themselves too much to admit their own possible inferiority to niggers without newspapers; but as I prefer niggers to whites, and much prefer oriental art to European, I incline to make the most of the tropics while the white is still tolerated there."[30] Adams' experiences with the diverse races and cultures of the world liberated him from the stifling



Henry Adams and John LaFarge at the door of their house in Fiji, 1891. Photo courtesy of the Massachusetts Historical Society.

conformity of European manners, morals and taste, and prepared him for the "multiplicity" that the new century promised.

Thus, in 1900 Adams found himself before the dynamos and realized that his pursuit of an education that could reconcile the contradictions and paradoxes of human existence had failed. The unity and continuity of human experience that he had hoped to find through history had disintegrated into discreet, unpredictable and inexplicable "explosions" or "catastrophes." When Adams turned to science,

he discovered that the benign Newtonian "universe" of his youth had disintegrated into the untamed "multiverse" of randomness, chance and relativity of the twentieth century. The universal, immutable principles of Newtonian mechanics, upon which more than two hundred years of scientific progress depended, had been undermined by the "avalanche of unknown forces" that Adams had encountered at the Paris Exposition.[31]

However, Adams did "not care to imitate Carlyle and Ruskin and Emerson ... by trying to make a living by abusing the society of my time, nothing remains but to quit it and seek another."[32] To Adams, the demise of the deterministic theories of both history and science at the very height of their ascendancy was a happy congruence. After his adventures in Asia and the tropics, he had come to prefer the irrational to the rational, the relative to the absolute, the heterogeneous to the homogeneous. He could have readily and even eagerly accepted Einstein's pronouncement of a few years later that there was no privileged position or direction in nature. Moreover, the "multiverse" of the new century helped to explain much that had eluded his lifelong pursuit of an education, "especially the persistently fiendish treatment of man by man ..." Thus, when he finally applied the "law of the new multiverse" to history in the last chapters of his autobiography, it was to "educate" his readers in the mysteries of a world "where order was an accidental relation obnoxious to nature ... against which every free energy of the universe revolted; and which, being merely occasional, resolved itself back into anarchy at last."[33]

Despite such professions of faith in a subjective, contingent and necessarily pluralistic universe without beginning or end, direction or purpose—all articles of faith of modernism, it is William James and not Henry Adams who is most often considered America's first modernist intellectual.[34] Certainly James, with his "stream of consciousness" and his emphasis on the primacy of unintellectualized sensory experience, was a modernist. But this is neither the place nor the time to determine the father of American modernism. Perhaps a more useful comparison would be between Adams and another of his contemporaries, Mark Twain. Adams and Twain experienced very similar intellectual odysseys, but came to strikingly disparate conclusions. By the turn of the century, both found themselves turning to science for answers to the perplexing questions of their day. However, Twain's conversion was to the mechanical determinism of Darwinian evolution, sans the troubling randomness that most of Twain's contemporaries conveniently ignored. Twain first revealed these inclinations in his essays "What is Man" and the "Mysterious Stranger Manuscripts," both written around the turn of the century when those very doctrines were being rejected by scientists and philosphers alike.[35] More importantly, it was at that very time that Adams chose to follow modern science along the riskier but more exciting path of indeterminacy and relativity.

That it was Adams rather than Twain who chose flux and uncertainty over order and predictability distinguishes Adams as much from American intellectual traditions as it does from Twain. A few of Adams' American contemporaries

such as Charles Eliot Norton sensed the impending intellectual revolutions at the turn of the century, but only James understood the portentous nature of those changes.[36] Both James and Adams were acutely attuned to the prevailing European intellectual tendencies, and Adams' scientific and historical musings after 1900 can only be understood in that context. Whatever his informing source, Adams could never be considered as merely an "American" intellectual.

For example, he shared his interest in the Second Law of Thermodynamics with Friedrich Nietzsche, one the founding fathers of European modernism, who used the indeterminacy implicit in the Second Law as an example of the unlimited potentiality of the future in his doctrine of the Eternal Return.[37] Additionally, Adams' fascination with Oriental culture and philosophy, which he first expressed in an 1895 poem entitled "Buddha and Brahma," paralleled that of many contemporary European intellectuals.[38] The infinite possibilities inherent in the eternal flux of the Second Law or Buddhism would appeal to an historian who had just realized that in the contingent universe of modern science the future is not dependent upon the past. While this may have devalued the lessons of history, it opened the universe to humans' creative energies. But if they were to take advantage of the opportunities in the strange new world of the twentieth century, without repeating the follies of the past, they would have to develop "new mental powers"—a new consciousness as it were. The mind would have to "jump" across the chasm separating the centuries, for "in 1900, the continuity snapped."[39]

To acquire these "new mental powers," Adams turned to science after 1900. He realized that science was the language of the new century. This was the lesson Adams hoped to impart to his fellow historians. They could no longer naively assume that there was any necessary sequence, direction or purpose in either nature or history. The laws of the new "multiverse," whether moral or physical, were not absolute, immutable or divinely inspired, but mere conveniences freely created by the human mind and imposed for a cosmic spilt-second on the chaos that was nature. Although Adams was as troubled by the uncertain prospects of the twentieth century as any of his contemporaries, the shattering experiences of 1900 had at least liberated him from the suffocating conventions of the past that he quite correctly predicted would soon bring Western civilization to the brink of destruction. Modern science, on the other hand, with its emphasis on the irrationality of nature and the subjectivity of knowledge, helped to explain the contradictions and paradoxes that so perplexed Adams, and offered an alternative world where the avenues for human experience, and human salvation, were limited only by the imagination. Adams' *Annis Mirabilis* severed his ties with the past, but left him adrift in a world of "supersensual chaos" that "had no common scale of measurement with the old."[40] It was Adams' willingness to educate himself in the language and concepts of modern science that distinguished him from his contemporaries, including many scientists, who withdrew at the prospects of a world stripped of familiar landmarks or signposts. But it was his willingness to accept a world of effects without causes, motion without direction, and change without purpose that distinguished him as a modernist.

Notes

1. William Jordy, *Henry Adams: Scientific Historian* (New Haven, 1952). One of the few exceptions to this standard interpretation of Adams is Howard M. Munford's "Henry Adams and the Tendency of History," *New England Quarterly* 26 (1959), 79-90.

2. Daniel Joseph Singal, "Towards a Definition of American Modernism," *American Quarterly* 39 (Spring 1987), 7-26; Malcolm Bradbury and James McFarlane, "The Name and Nature of Modernism," in Bradbury and MacFarlane, eds. *Modernism, 1890-1930* (New York, 1976), 19-55.

3. T. Jackson Lears, *No Place of Grace; Antimodernism and the Transformation of American Culture, 1880-1920* (New York, 1981),

4. Henry Adams to Charles Francis Adams, December 18, 1900. All letters cited in the text will be from the Henry Adams Papers, Massachusetts Historical Society, Boston, Massachusetts.

5. "Henry Adams, the Second Law of Thermodynamics, and the Course of History," *Journal of the History of Ideas* 48 (July-September 1987), 467-82; "'Our Power Is Always Running Ahead of Our Mind': Henry Adams' Phases of History," *New England Quarterly* 62 (June 1989), 163-86.

6. Henry Adams, *The Education of Henry Adams* (Boston, 1918), 382.

7. Adams to Hay, November 7, 1900.

8. Adams to Hay, June 26, 1900. "Yu" and "Li" are references to K'ang Yu-wei (1858-1927), a Confucian scholar and leader of the Chinese Reform Movement of 1898, and Li Hang Chang (1823-1901), Chinese stateman responsible for negotiating the settlement of the Boxer Rebellion.

9. *Ibid.*

10. *Ibid.*

11. Adams to Gaskell, March 29, 1900.

12. Adams to Hay, June 26, 1900.

13. Adams to Gaskell, March 29, 1900.

14. *Ibid.*

15. *Education*, 380.

16. *Ibid.*, 457.

17. *Ibid.*, 381.

18. *Ibid.*

19. James MacFarlane, "The Mind of Modernism," in Bradbury and MacFarlane, *Modernism*, 71-93.

20. Adams to Elizabeth Cameron, April 25, 1898.

21. Adams to Elizabeth Cameron, December 24, 1897.

22. Adams to Elizabeth Cameron, April 10, 1898; Adams to Hay, December 15, 1899; Adams to Gaskell, January 10, 1901.

23. Adams to Brooks Adams, March 5, 1898; Adams to Elizabeth Cameron, April 25, 1898.

24. Adams to Elizabeth Cameron, August 4, 1898.

25. Adams to Elizabeth Cameron, April 25, 1898; December 25, 1898.

26. Adams to Elizabeth Cameron, August 9, 1898.

27. Adams, like many of Kipling's contemporaries, actually misinterpreted "Recessional" as a call for retreat, something that Adams applauded. See Adams to Elizabeth Cameron, February 27, 1899. Kipling, however, insisted that he was urging his countrymen to stand fast in the face of adversity and pursue the Empire's interests with renewed, even religious, fervor, hence the hushed, pious tone of the poem. See Angus Wilson, *The Strange Ride of Rudyard Kipling* (New York, 1978), 203-4.

28. Adams to Elizabeth Cameron, April 13, 1891.

29. Adams to Elizabeth Cameron, February 3, 1894.

30. Adams to Gaskell, April 28, 1894.

31. *Education*, 461.

32. Adams to Gaskell, April 28, 1900.

33. *Education*, 457-8.

34. Singal, "American Modernism," 17.

35. Sherwood Cummings, *Mark Twain and Science; Adventures of a Mind* (Baton Rouge, 1988), 201-17.

36. Keith R. Burich, "Charles Eliot Norton, Henry Adams, and the Catholic Church as a Symbol of Order and Authority," *The Catholic Historical Review* 75 (July 1989), 423-38.

37. Stephen G. Brush, "The Development of the Kinetic Theory of Gases. VIII. Randomness and Irreversibility," *Archive for the History of the Exact Sciences* 12 (1974), 66-71.

38. Heinrich Dumoulin, "Buddhism and Nineteenth-Century German Philosophy," *Journal of the History of Ideas* 42 (July-September 1981), 457-70.

39. *Ibid.*, 457.

40. *Ibid.*, 381.