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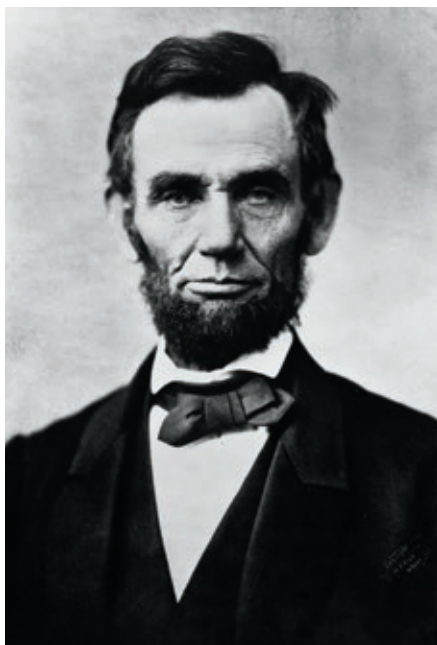
Something Solid to Rest Upon: Abraham Lincoln's Interest in Science

William F. Hanna

As darkness fell on a warm summer evening in August 1864, Dr. Joseph Henry, the Secretary of the Smithsonian Institution, stood in the tower of a building on the grounds of the Old Soldiers' Home, located three miles northwest of the U.S. Capitol. Called by one historian the greatest American scientist since Benjamin Franklin, Henry was a physicist by training. His work on electromagnetism in the 1840s helped lay the groundwork for the first practical telegraph.

Standing nearby was President Abraham Lincoln, whose summer cottage was located adjacent to the Old Soldiers' Home. The two men were together to witness an ultimately successful experiment in which Morse code signals would be flashed by lantern light from the Soldiers' Home with the hope of receiving an answer from a signalman placed across the city in the tower of the Smithsonian Institution. As the Civil War dragged into its fourth year, Lincoln and his generals looked for any advantage that might bring the bloodletting to a speedier conclusion, and they hoped that improvements in communication would help.

Over the previous three years the scientist and the president had developed a highly successful working relationship, based in large part upon Lincoln's lifelong fascination with scientific principles and their practical application. Unlike Dr. Henry, the president's meager formal education had come through brief sporadic attendance in frontier "blab schools." In an autobiographical sketch written during his 1860 presidential campaign, he noted that he went to school only "by littles." Beyond



*President Abraham Lincoln, November 1863
(Photo credit: Alexander Gardner).*

his ability to read, write and perform simple arithmetic, Lincoln admitted that whatever education he gained afterward had come informally and as required during his rise to professional and political success. "The pressure of necessity," he called it. And yet, as Lincoln matured, he also felt pressure

of another kind. Keenly aware of the vagaries of an ever-changing world, he confronted the painful ambiguity of life and death by seeking solace in the laws of physical science.

Lincoln's interest in science and mathematics began in 1833, when he took a surveying job in Illinois. Wayne C. Temple writes that the twenty-four-year old Lincoln mastered enough geometry and trigonometry to earn a reputation as a competent surveyor. William H. Herndon was Lincoln's longtime law partner, and his voluminous correspondence has been collected and edited by Douglas L. Wilson and Rodney O. Davis. Their research presents a letter in which Herndon remembered that during the same period that Lincoln mastered surveying, he also studied natural philosophy, astronomy and chemistry. "His mind," wrote Herndon, "required and lived in facts, figures and principles." Although generally a patient man, said Herndon, his partner hated abstraction. "If you wished to be cut off at the knees just go at Lincoln with ... glittering generalities."

In addition to the demands of frontier surveying, Lincoln also put his accumulating knowledge of scientific principles to another, deeply personal, use. As a young man, Lincoln was an outspoken religious skeptic. It was during this period, wrote his friend James Matheny, that Lincoln, "at least bordered on absolute atheism." He was "enthusiastic in his infidelity," and he used science to argue against scriptural revelation. His was "the language of respect," wrote Matheny, "yet it was from the point of ridicule—[but] not scoff."

In 1834 Lincoln was elected to the Illinois legislature for the first of four terms, and two years later was admitted to the state's bar. After moving to Springfield in 1837 he became a familiar figure within legal and political circles. As a loyal member

of the Whig Party, both in the state legislature and later during his single term in the Thirtieth Congress (1847–1849), Lincoln supported a vigorous program of “internal improvements,” and became a strong proponent for the construction of railroads and canals.

Robert V. Bruce, in his prize-winning history of American science, writes that Lincoln’s rise to prominence coincided with the era that saw the beginning of modern scientific practice in the United States. In addition to rapid population growth, the three decades after 1846 witnessed geographic and economic expansion resulting in scientific improvements to both agriculture and industry. This period also saw increased

the difficulty of boats trying to navigate the Sangamon River, Lincoln’s invention was intended to keep vessels from running aground. Equipped with what he called “buoyant chambers,” the apparatus was designed to float a vessel over dangerous shoals. Nothing came of it, and Lincoln returned to his law practice, but to this day he remains the only president ever to hold a patent.

In Lincoln’s time, frontier lawyers rode the Illinois Eighth Judicial Circuit, traveling from town to town to hold court each spring and fall. John T. Stuart, the future president’s mentor and first law partner, said that Lincoln knew nothing about history, had no faith in biography, and knew only a lit-

brought into the office one volume in a series edited by David A. Wells entitled *Annual of Scientific Discovery*. These books featured brief articles on new developments in science and technology. Herndon wrote that after examining the book, Lincoln rose from his chair and said that he was going to immediately purchase the entire set. After doing so, he told Herndon, “I have wanted such a book for years, because I sometimes make experiments and have thoughts about the physical world that I do not know to be true or false. I may, by this book, correct my errors and save time and expense.”

Another book that Lincoln found interesting was Charles Darwin’s *On the Origin of Species*, published in 1859. This was not Lincoln’s first foray into the subject of evolution. Both Robert V. Bruce, and more recently James Lander, have written that he had earlier read Robert Chambers’ *Vestiges of the Natural History of Creation*, published in 1844. Based on his partner’s interest in the subject and also upon many discussions with him, Herndon stated unequivocally that Lincoln was a well-informed evolutionist.

His election to the presidency in November 1860 gave Lincoln the opportunity not only to meet practicing scientists, but also to influence federal policy toward the adoption and implementation of new technology. During this period he also forged an important relationship with the Smithsonian Institution and Dr. Joseph Henry, its first secretary. The president and his cabinet were ex-officio regents of the Smithsonian, and though they never attended a meeting, Lincoln took an active interest in its welfare. In addition to attending lectures and witnessing the signaling experiments conducted there, he occasionally asked Henry for clarification or information on scientific matters that might affect the war effort. Lincoln also provided critical help in bypassing the

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specialization in science; more formal education in scientific subjects and more fulltime work in the field. In 1846, the year in which Lincoln was elected to Congress, the Smithsonian Institution was founded and the first issue of *Scientific American* was published. While living in Washington, it is likely that the young congressman visited the National Observatory, which had opened in 1844 with a state of the art telescope. The planet Neptune had been discovered shortly before Lincoln’s arrival in the capital and considering his interest in astronomy the Illinoisan was almost certainly a regular at the observatory.

In March 1849, at the end of his congressional term, Lincoln applied for and was granted a patent. Remembering

the geography. Nevertheless, said Stuart, Lincoln “read hard works,” remembering that as early as 1844 and continuing after his return from Congress, he carried a volume of Euclid in his saddlebags while traveling the circuit. Indeed during the campaign of 1860, the candidate himself thought it important enough to state that he had “nearly mastered” the six books of Euclid.

While many of Lincoln’s friends agreed that he read only to gain specific knowledge and not for pleasure, it was not because there was a shortage of books available to him. Herndon had an extensive library, Lincoln had full access to it, and he occasionally availed himself of the privilege. For example, Herndon remembered that he once



President Abraham Lincoln signing the Charter of the National Academy of Sciences (NAS). Apocryphal rendition shows Lincoln with several founding members of the NAS. Left to right: Benjamin Peirce, Alexander Dallas Bache, Joseph Henry, Louis Agassiz, President Lincoln, Senator Henry Wilson, Admiral Charles Henry Davis, Benjamin Apthorp Gould. (Painting by Albert Herter, 1924, courtesy of the National Academy of Sciences).

War Department's bureaucracy after fire ravaged the Smithsonian Castle in January 1865. Upon an urgent request from Henry, Lincoln saw to it that the building's roof received critically important emergency repairs.

At least once, Lincoln consulted Henry on a matter of personal interest. In 1862, Mary Lincoln, distraught over the death of their son Willie, had turned to spiritualism in an effort to communicate with her lost boy. A séance had been held at either the

White House or the Soldiers' Home, and Lincoln, always the skeptic, asked Dr. Henry to look into the subject and figure out how the "communication" actually worked. To comply with the president's request, Henry invited Charles J. Colchester, one of the most prominent psychics of the day, to display his powers at the Smithsonian. When Colchester appeared, Henry quickly determined that the sounds allegedly emanating from "spirits" actually came from something attached

to Colchester's body. When the scientist asked to examine Colchester's person, the medium fled.

Thanks to the Republican Party's majority in both houses of the Thirty-Seventh Congress (1861-1863), Lincoln was able to sign into law two bills that helped join both theoretical and applied science. On May 15, 1862, he signed a bill creating the Department of Agriculture as a separate, non-cabinet federal agency removed from the Patent Office. Its first commissioner, the appropriately named Isaac Newton, was a self-made man who favored a scientific approach to agriculture, and within a short time his department had hired a chemist, botanist, entomologist and statistician. Gabor S. Boritt, in his *Lincoln and the Economics of the American Dream*, has written that in supporting the newly independent agency, Lincoln was simply endorsing the traditional Whig "inclination toward intensive, scientific husbandry," and Bruce notes that farmers soon began to appreciate the benefits of applied science. We can perhaps see the president's influence in Commissioner Newton's first

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annual report. It was the department's goal, he wrote, "to make two blades of grass grow where one grew before." It appears that the inspiration for those words came from Lincoln himself, who in an 1859 address to the Wisconsin Agricultural Society, said: "Every blade of grass is a study; and to produce two where there was but one, is both a profit and a pleasure."

In July 1862, Lincoln signed the Morrill Land Grant Act into law thus supporting colleges that gave instruction in agriculture and engineering. Originally passed in 1859, this measure had been vetoed by President James Buchanan. Under the terms of the act, each state received 30,000 acres of federal land for each member of Congress in 1860. The land could be sold by the states with the proceeds going to fund the colleges. Engineering courses had been almost exclusively taught at the U.S. Military Academy at West Point, but the new law made it possible for other institutions to train engineers.

In March 1863, eight months after the passage of the Morrill Act, Lincoln signed an Act of Incorporation creating



Dr. Joseph Henry, first Secretary of the Smithsonian Institution. (Photo credit: Henry Ulke, courtesy of the Smithsonian Institution Archives).

The most extensive study of Lincoln's interest in science and technology has been in his advocacy of certain weapons of war, and in this the bar was again set by Robert V. Bruce, whose 1956 book, *Lincoln and the Tools of War*, remains the standard. Bruce states that during the first three years of the Civil

Additionally, Lincoln took an interest in any weapon that he thought might bring an earlier end to the war. In 1861, for example, Thaddeus Lowe secured an appointment with the president to present his idea to use hot air balloons for reconnaissance. Lincoln was present as Lowe brought his balloon down Pennsylvania Avenue and tethered it in back of the White House overnight. Lincoln's intervention also led to the Union army's largest order of breach-loading rifles, and also resulted in tests of many unconventional weapons, including incendiary devices and body armor. By 1864, as a Union victory became more apparent, Lincoln's attention was demanded elsewhere and his active efforts to promote new weapons and ordnance substantially decreased.

Twelve weeks after securing a temporary roof for the Smithsonian Castle, Lincoln was dead, and unburdened of the "pressure of necessity." Not only had it made this boy who had gone to school "by littles" one of the most eloquent proponents of human rights, it had also driven his enduring interest in science. "He wanted something solid to rest upon," said his friend Joseph Gillespie, and he pursued it in the mysteries of the physical universe. In a world that often seemed random and capricious, Lincoln found comfort and a degree of certainty in the empirical, disciplined domain of science.

...to this day [Abraham Lincoln] remains the only president ever to hold a patent.

the National Academy of Sciences. The president's support came in spite of opposition from his friend Dr. Henry, who feared that the organization would become elitist and undemocratic. Henry eventually overcame his objections and served as the Academy's second president.

War, Lincoln, because of his natural curiosity and the obstinacy of the army's bureaucracy, sometimes found himself involved in the development of weapons and ordnance. Inventors hoping to skirt regular army channels often appealed directly to Lincoln for help, and this sometimes resulted in a request from the president to the War Department asking that a man be given a hearing.



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