

**Lane, Jonathan Homer** (9 Aug. 1819-3 May 1880), physicist and mathematician, was born in Genesee, New York, the son of Mark Lane and Henrietta Tenny, farmers. After the age of eight, the boy was taught chiefly at home. He was well enough educated to teach in district schools for a year, and in 1839 he entered Phillips Academy in Exeter, New Hampshire, to prepare for college. There he developed an interest in determining absolute zero, the hypothetical lowest limit of temperature.

Lane entered Yale College as a sophomore and graduated in 1846. He became noted for helping fellow students in mathematics and natural science. He taught at a seminary in Vermont for a year, and in 1847 he began work in Washington, D.C., for the U.S. Coast Survey. On the recommendation of Joseph Henry, first secretary and director of the Smithsonian Institution, in 1848 Lane became an assistant examiner in the Patent Office at a time of an increase in its scope and staff. He was promoted to principal examiner in 1851. His biographer Cleveland Abbe said, "As an examiner Mr. Lane was laborious and thorough, cautious and critical, conscientious in the extreme. . . . It may safely be said that no patent approved and endorsed by him has ever been successfully contested." Lane published four articles on mathematical aspects of electricity from 1846 to 1851.

In 1857 a change in administration led to political patronage in the Interior Department, so Lane's superior resigned in protest, and Lane was let go. Sources differ on how he supported himself after that, but he was said to be very frugal. Lane may have served as a consultant in patent cases in Washington. He had a close association with Henry, who often sought his advice on questions in physics and mathematics. In 1859 Lane carried out some studies for Henry concerning the Atlantic telegraph cable. He also tried to develop equipment for determining extremely low temperatures by means of the successive compression and expansion of gases.

In 1860 or 1861 Lane moved to Venango County, Pennsylvania, perhaps to look into opportunities in the new industry of petroleum, but mostly because a brother was a blacksmith there. Lane wanted his help in building the scientific equipment for measuring low temperatures, but that did not happen. He returned to Washington, D.C., in 1866 and was provided with some support by Henry in his pursuit of determining absolute zero.



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In 1869 the superintendent of the U.S. Coast Survey, [Julius E. Hilgard,] who knew Lane, employed him as a "verifier of standards" in the Office of Weights and Measures, predecessor of the National Bureau of Standards. His duties chiefly involved establishing standards for metric units, which are particularly affected by changes in temperature. Lane would continue in this post until his death. While working there he perfected equipment for suppressing the undulations in the mercury artificial horizon, a precision measuring technique for determining horizontal surfaces and the vertical in gravity.

Pursuing other scientific studies, Lane observed a total solar eclipse at Des Moines, Iowa, on 7 August 1869 and reported on it to the U.S. Coast Survey and Naval Observatory. That same year he read a paper to the National Academy of Sciences, which was published in 1870 as "On the Theoretical Temperature of the Sun, under the Hypothesis of a Gaseous Mass Maintaining Its Volume by Its Internal Heat and Depending on the Laws of Gases as Known to Terrestrial Experiments" (*American Journal of Science* 2 [1870]: 57-74). Although he did not provide proof in his paper of the nature of the contraction of a gaseous body, he was credited by Simon Newcomb as having given such proof to him in person. Lane's work offered careful computation of the sun's mass and heat relationships and is considered "a real contribution to the developing evidence of stellar evolution," according to Nathan Reingold.

Lane continued research on determining absolute zero and may have reached significant conclusions by 1870, but he did not publish them. Colleagues noted that he was reluctant to publish until he was certain of all points. Many of his intended projects were not completed, but notes in his personal papers in the U.S. National Archives describe his efforts on ingenious machines for such ideas as determining the quantitative relationship between static and voltaic electricity, a "visual telegraph for transmitting to any visible distance," an electric governor "for very exact, uniform motion, controlled by electro-magnetic break-circuit," and other devices. He did not obtain any patents.

Colleagues noted in memorial tributes that Lane had "little faculty of speech," that it was hesitant and slow, but that his writing was lucid and precise. He was said to be always helpful to colleagues, especially in reviewing mathematical material for them. He was described as of "a most retiring disposition," and he never married. In the late 1850s Lane and Henry were original members of a scientific and social club that in 1871 became the Philosophical Society of Washington. Lane was elected to the National Academy of Sciences in 1872. He died in Washington, D.C.



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## Bibliography

Lane's personal papers are in the records of the National Bureau of Standards in the U.S. National Archives in Washington, D.C. His work on the mercury artificial horizon was published in the annual report of the U.S. Coast Survey for 1871, pp. 181-92. A posthumous paper by Lane is "On the Coefficient of Expansion of the British Standard Yard . . .," *Report of Coast and Geodetic Survey* (1877): 148, 155-66. Biographies are J. E. Hilgard, *Bulletin of the Philosophical Society of Washington* 3 (1880): 122-24; and Cleveland Abbe, National Academy of Sciences, *Biographical Memoirs* 3 (1895): 253-64, with bibliography. A significant account is by historian Nathan Reingold, *Dictionary of Scientific Biography* 8 (1973): 1-3, who reviews Lane's archival material and notes uncertainties and probable errors in some of Abbe's statements.

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Elizabeth Noble Shor

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