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(*b*. Salem, Massachusetts, 26 March 1773; *d*. Boston, Massachusetts, 16 March 1838)

astronomy.

Bowditch, a poor boy, is a fine example of the autodidact. Apprenticed to a ship's chandler at an early age, he acquired skill in languages and considerable knowledge of mathematics and other sciences through reading and study. Bowditch's scientific career was largely one of self-education; the United States of his day afforded very little opportunity for original research in astronomy and mathematical physics. As a young boy he went through the not inconsiderable book resources of Salem, including the library of Richard Kirwan, which had been seized by a local privateer. In 1790 he learned Latin in order to read the *Principia;* at the age of forty-five he started to study German in order to read the scientific literature appearing in that language. Between 1795 and 1803 Bowditch participated in five long sea voyages, the last as master of a ship bound for Sumatra; he continued his studies on these long trips. When he retired from the sea in 1804, he entered the business world; at his death, he was an insurance actuary in Boston. Offers from American universities never strongly tempted Bowditch, for they had little to offer a man of his caliber.

Beyond his obviously considerable native ability, Bowditch brought two characteristics to his scientific work. In addition to his erudition in mathematics, astronomy, and physics, he was apparently one of those who delight in mathematical computations. Not surprisingly, his early work often consisted of corrections of errors in the writings of others, apparently uncovered while working through the literature. Of this nature is the *New American Practical Navigator*, which originated in corrections and extensions of the work of John Hamilton Moore. By the third edition (1802) the work had changed sufficiently to bear Bowditch's name, as it does in successive editions to this day. By 1815 he had contributed pieces on astronomy, mathematics, and physics to both American and European publications. His article in *Nicholson's Journal* (1811) on the 1807 meteor explosion over Weston, Connecticut, was the most spectacular, while his report in the *Memoirs* (1815) of the American Academy of Arts and Sciences on the motion of a pendulum suspended from two points was probably the most significant. Even before the publication of his translation of Laplace's *Mécanique céleste*, his writings had earned Bowditch membership in the Royal Society and other honors.

By 1818 Bowditch had completed his translation of the first four volumes of the *Mécanique céleste*. His purpose was threefold: to supply steps omitted from the original text; to incorporate later results into the translation; and to give credits omitted by Laplace. There is no evidence that Laplace ever responded to any communication from Bowditch, a fact sometimes ascribed to the third purpose. The four volumes appeared in 1829, 1832, 1834, and 1839, the last posthumously. The delay in publication was undoubtedly due in part to financial problems. Bowditch, who would not have people subsidize, out of regard for him or other irrelevant reasons, a book they could not read, printed the work at his own expense. It is also most likely that he continued to work over the volumes between 1818 and their appearance, particularly to bring the subject matter up to date. The fifth volume of the *Mécanique céleste* appeared too late for translation by Bowditch. Probably the only person who aided Bowditch was Benjamin Peirce, who read over part of the text for errors. Printed in a small edition, the work was perhaps more widely admired than read, simply serving to confirm the translator's already high reputation. Nevertheless, outside of France, Particularly in English-speaking countries, Bowditch's edition, rather than the original, was often the means of learning about the mechanics of the heavens.

BIBLIOGRAPHY

I. Original Works. By far the best source of information on Bowditch are his papers and his library, in the Boston Public Library. These collections have not yet received the attention they deserve; much of our present knowledge of Bowditch derives from older works, often written with little recourse to original sources of this nature. A few letters from the Bowditch Collection are in N. Reingold, *Science in Nineteenth Century America, a Documentary History* (New York, 1964), pp. 11–28. The manuscript of his journal during his fourth voyage was edited by T. R. McHale and M. C. McHale as *Early American-Philippine Trade: The Journal of Nathaniel Bowditch in Manila, 1796*, Yale University Southeast Asia Studies, Monograph Series, No. 2 (New Haven, 1962). Aside from a few remarks on Chinese numerical notations, the journal does not relate to Bowditch's intellectual interests.

No complete bibliography of Bowditch's writings exists. The best single source of bibliographical information, as well as other data on Bowditch, was published by the Peabody Museum: *A Catalogue of a Special Exhibition of Manuscripts, Books, Portraits and Personal Relics of Nathaniel Bowditch (1773–1838) With a Sketch of the Life of Nathaniel Bowditch by Dr*.

Harold Bowditch and an Essay on the Scientific Achievements of Nathaniel Bowditch With a Bibliography of his Publications by Professor Raymond Clare Archbald (Salem, Mass., 1937). This publication is the best individual introduction to Bowditch, his writings, and the collections in the Boston Public Library. The bibliography, while quite adequate on Bowditch's larger works and the publications in the *Memoirs* of the American Academy of Arts and Sciences, does not attempt to specify many of Bowditch's mathematical and astronomical contributions, which often appeared in the form of letters or brief extracts from letters. Solutions to mathematical problems are in Robert Adrain's *The Analyst*, 2 vols. (Philadelphia, 1808–1814); and R. Adrain and J. Ryan, *Mathematical Diary*, 2 vols. (New York, 1825–1828)—thirty-two solutions are in the latter, for example. Other examples of his work appear in Zach's *Monatliche Correspondenz* and the *Correspondence astronomique*, as well as the *Zeitschrift für Astronomie*. The *North American Review*, **20** (April 1825), has an important Bowditch review of several recent works in astronomy.

II. Secondary Literature. The best biography of Bowditch remains the one prepared by his son, Henry Ingersoll Bowditch, and published in Volume IV of the translation of the Mécanique céleste, and separately in subsequent editions. Despite its understandable filiopietism and a tendency to ramble, the work does convey much information and shows signs of honest attempts to gather information by consulting the Bowditch papers and old friends. Bowditch's descendants are a very distinguished Massachusetts family; and in writings by or about them there is information of indeterminate validity about Nathaniel Bowditch. Of the obituaries published at Bowditch's death, the most useful is John Pickering, *Eulogy on Nathaniel Bowditch, LL.D.*... (Boston, 1838). Robert E. Berry, *Yankee Stargazer* (New York, 1941), is a good popular biography but not much of an advance over Henry Ingersoll Bowditch. For indications of Bowditch's reputation in the last century, see I. Todhunter. *A History of Mathematical Theories of Attraction and the Figure of the Earth* (London, 1873), pp. 309–366. Harold L. Burstyn, *At the Sign of the Quadrant*, Publication No. 32 of the Marine Historical Association (Mystic, Conn., 1957), pp, 11–30, is a good introduction to the hydrographic part of Bowditch's career. Reingold, *op. cit.*, has a brief discussion of Bowditch.

Nathan Reingold