

A Brief Sketch of the Life of Nathaniel Bowditch

As long as ships shall sail, the needle point to the north, and the stars go through their wonted courses in the heavens, the name of Dr. Bowditch will be revered as one who helped his fellow man in a time of need ...

Extract from a resolution of the Salem Marine Society
following the death of Nathaniel Bowditch

Humble Beginnings

Just how did a boy born in Salem Massachusetts, who was so poor that one of his chores was to carry a shovel full of hot coals from the big house with the seven gables that sat at the end of his street home to light the fire in the kitchen fireplace, become so revered? The chore of ‘carrying fire’ was a difficult and responsible job for a young boy to have. When the fire went out, hot coals were needed to rekindle the wood and start the flames burning again. The fireplaces in homes of this era were very large and depended on to cook all the food, heat hot water, and keep the house warm. So keeping the fire burning at all times was necessary. Even though Nathaniel was young and not very strong, he carried the hot and heavy shovel of burning coals up Turner Street from what is now known as the House of the Seven Gables to his family home. Nathaniel Bowditch learned at a very young age to be responsible and diligent in his chores. And, although he started off life in a poor and humble family, with very little education, he became highly respected throughout the world for his mathematical and scientific accomplishments.

Nathaniel was born in 1773, three years before the Declaration of Independence was signed. He lived at a very interesting time in history. Nathaniel was the fourth child of six children. His father and grandfathers were sea captains that sailed from Salem before the Revolutionary War began. Nathaniel’s father had been the captain of a ship that ran aground in 1775 when Nathaniel was two years old. Shortly after that happened his father, Captain Bowditch, moved his family to Danvers to get away from the sea. While Nathaniel lived in Danvers he went to school for a little while where he probably learned only the basics of reading and writing and perhaps he learned how to do a little simple math. When he was six years old, his family returned to Salem where Nathaniel would be responsible for carrying the shovel of ‘fire’ up Turner Street.

At seven years old, Nathaniel attended the schoolhouse at Master Watson’s on Union Street in Salem. Nathaniel loved to work out math problems and became so good at solving them that he asked Master Watson for a difficult problem to solve. Eventually Master Watson gave Nathaniel a very difficult problem that he thought Nathaniel would not be able to work out. Nathaniel studied the problem all night and when he presented the answer to the teacher the next day, Master Watson scolded him for lying because he did not believe that Nathaniel alone had solved

the problem. Nathaniel's older brother came to see the teacher explaining that Nathaniel had taught himself how to work out the problems. Habakkuk, Nathaniel's brother, suggested that the teacher give a difficult problem to Nathaniel then and there to see if he could do the math or not. When Nathaniel solved the problem, Master Watson was forced to admit that Nathaniel had told the truth.

Unfortunately, even though Nathaniel loved learning and had shown that he was a good and smart student, he had to leave school at the age of ten and go to work for his father. Nathaniel's father was a Cooper; a person who makes wooden barrels. Nathaniel was never again able to attend school in a formal schoolhouse with other students or a proper teacher. From the time of twelve years old everything Nathaniel wanted to learn he had to teach himself. The dedication Nathaniel showed toward learning and teaching himself would stay with him throughout his lifetime.

For two years, Nathaniel worked at the Cooperage, but the business was not making enough money to support the Bowditch family. Nathaniel's older brothers had left home and gone to work on ships that sailed from Salem Harbor to far off places. Nathaniel's father had fallen on hard times and could no longer afford to raise Nathaniel at home so he indentured him to a business where Nathaniel could learn bookkeeping. At the age of twelve, Nathaniel was sent to work for another business in Salem that was owned by two gentlemen named Ropes and Hodges. Nathaniel became an indentured servant. An indentured servant was not paid wages, but did receive room, food, and clothes. In those days, when a person was an indentured servant, they either lived in the back of the business or went to live at the house of the person who owned the business. Nathaniel was fortunate to be indentured to a kind family who let him live at their house and even have his own bedroom. Nathaniel Bowditch was indentured from the age of twelve years old until he turned twenty-one. He never again lived with his own family.

Life as an Indentured Servant

Ropes and Hodges' business was a ship chandlery. This is a shop where ship builders and seamen bought items to outfit their ships. Everything that was needed, from nuts and bolts to ropes and everything in between was bought at a ship chandlery. Today, people who build ships and maintain boats go to a modern day ship chandlery like the one in this picture that is still located in Salem. Nathaniel became the accountant for Ropes and Hodges and had to learn all of the items in the shop as well as the price of everything. When a customer would come in he would maintain an accurate record of their purchases. In between time spent with customers, Nathaniel continued teaching himself complicate math problems. Once, a customer came into the shop to purchase some hinges while Nathaniel was working out a problem, after the sale Nathaniel forgot to write the transaction into the account books causing the accounts to be inaccurate. Nathaniel was ashamed that he had made such a silly mistake and from that moment on he vowed he would finish the work he started before he would go back to other projects.

After five long years of working for Ropes and Hodges, they sold the business to Samuel Ward. For a brief moment, Nathaniel Bowditch thought he was a free man. Unfortunately, that was not the case; it appears that in purchasing the chandlery, Mr. Ward also purchased the indenture of Nathaniel Bowditch. Nathaniel would remain indentured for the chandlery until he was twenty-one years old; nine long years.

During his nine years of indenture, Nathaniel continued to teach himself mathematics. One day he heard of a type of math where you substituted letters for numbers; algebra. Nathaniel was so excited about learning this new type of math he stayed up all night learning about it. Eventually he became very proficient at algebra. When Nathaniel found out about something new, he read as much as he could on the subject and taught himself to become good at it. During this time at the ship chandlery, Nathaniel met two very important men of Salem who would help with his education. They were Reverend William Bentley and Reverend John Prince. Both men were highly educated and members of Salem's Philosophical Society. This was a group of men who had purchased a library of books that had been captured from a British ship and started, what eventually became, the basis for the Salem Athenaeum, a private library, which still exists on Essex St. in Salem. Both men were so impressed with Nathaniel's natural abilities to learn that they lent him books from this library. Reading these books opened up new worlds for Nathaniel. He learned about navigation and astronomy, as well as many other scientific wonders. When Nathaniel learned of important books that were written in other languages, he taught himself the new language by getting a copy of a Bible in English and a Bible in the other language and copying it word for word, by doing this he eventually learned how to read other languages like Latin, French, and Spanish.

A Free Man

When Nathaniel turned twenty-one, his indenture ended and he became a free man, but he needed a paying job. At that time, Rev. Bentley and Captain Gibaut were just about to start a new project surveying the Town of Salem. Rev. Bentley persuaded Nathaniel to take the job because they needed his skill of mathematics and Nathaniel needed a paying job, even if it was for only a few months. At the end of the time surveying, Captain Gibaut told Nathaniel that he was about to captain a ship owned by Elias Haskett Derby, the brig *Henry*, and sail around the Cape of Good Hope to the Isle of Bourbon to trade with the locals for items to bring home to sell. How would Nathaniel like to go along as the ship's clerk? Both of Nathaniel's older brothers had worked on several ships and Nathaniel liked this idea. Soon Nathaniel sailed on the *Henry*, but under the command of Captain Henry Prince. Nathaniel knew Captain Prince, as indeed, he knew most of the ship's captains and crews from his years spent assisting them in the chandlery, and he liked the captain. He agreed to sail on the ship as the ship's clerk and as the second mate. After his many years of being around the mariners, Nathaniel knew that trading was a way to make one's fortune. He discussed and received permission from Captain Prince to bring along a shipment of shoes to sell once they had landed on the Isle of Bourbon. Nathaniel had invested

all the money he had saved from the surveying job, \$135.00, into the venture. He was rewarded when all of the shoes were sold and he had a nice profit to show for his initiative.

From Clerk to Captain

It was on this first sea trip that Nathaniel was able to put into practice all the navigation and astronomy he had learned while reading the books in the Philosophical Society's library. As Nathaniel stood beside Captain Prince, he used his sextant at sea for the first time. A sextant is an instrument that can be held and is used to measure the distance between two objects such as the sun, moon, planet or star with the horizon and gives the navigator the ship's latitude. The longitude of the ship is easily determined by the use of a chronometer. However, chronometers were extremely expensive so most ships' navigators had to rely on taking lunar measurements. Very few mariners took lunar measurements because it was often difficult to get a clear sight of the moon and the mathematical computations needed to determine the measurement took a long time to work out. However, with Nathaniel Bowditch onboard the ship, he not only took the lunar measurements and worked out the computations, he taught every man on the ship how to take *lunars*.

Teaching was a new endeavor for Nathaniel. At first, he had a difficult time explaining to the men how the math worked and why it was necessary to take the measurements in a certain way. He tried many different teaching approaches until he finally made things clear to everyone on the ship. Because Nathaniel was so dedicated to his own learning, he became committed to teaching the men on the *Henry* what he knew. Due to this special knowledge, eventually every man on the ship *Henry* who sailed with Nathaniel Bowditch went on in his life to become a first mate or captain of his own ship. Nathaniel not only loved learning about mathematics, navigation, and astronomy, he loved to teach his fellow shipmates so that they could better their lives and the lives of their families.

Nathaniel went to sea a total of five times. Each time he took on a little more responsibility than the trip before. When Nathaniel sailed out on the *Henry* with Captain Prince, they left from Derby Wharf in Salem on January 11, 1795 and returned exactly one year later on January 11, 1796. Then two months after returning home, he shipped out again as the supercargo on the ship *Astrea* on March 15, 1796 to Lisbon and Manila and this time did not return until May 22, 1797. As the supercargo Nathaniel was responsible for trading all of the cargo that was in the ship's hold to make the owner of the ship money. Ships would travel around from port to port selling and buying different goods until they had reloaded the ship with the goods wanted and needed, and would sell at a nice profit at home. The supercargo position was very important since Nathaniel would be called on to negotiate prices for goods with people from a variety of different cultures and languages. Two more times Nathaniel sailed on the *Astrea* as the supercargo; from August 21, 1798 to April 6, 1799 to Alicante and Cadiz, Spain and again on July 23, 1799 to September 15, 1800 to Batavia Indonesia and again to Manila.

On his final voyage, Nathaniel sailed not only as the supercargo, but as the ship's Captain as well. On this trip he sailed the *Putnam* which left on November 21, 1802 and returned to Salem on December 25, 1803 during a terrible blizzard. Because Nathaniel knew the area so well and could rely on his mathematical skills, he was able to determine exactly where the ship was when it passed Baker's Island. Even though no one on board the ship could see land, Nathaniel was able to bring the *Putnam* in to Derby Wharf safely based he sighted the lighthouse at Baker's Island and quickly worked out his calculations. This was an accomplishment that many sailors talked about for many years to come. It was Nathaniel's astute observations and knowledge of mathematics that allowed him to accomplish this dangerous feat.

The New American Practical Navigator

During these long sea voyages, Nathaniel worked on many mathematical and scientific exercises in his spare time. During this age of sail, most mariners relied on a book of charts with mathematical computations to help them navigate across the oceans. This book was written by John Hamilton Moore and was called The Practical Navigator. During his ocean voyages Nathaniel studied this book. It wasn't long into his first sailing trip that Nathaniel noticed the Moore's book had numerous mistakes. By the time Nathaniel had returned to Salem after his first voyage, he had discovered hundreds of mistakes in Moore's calculations. These mistakes were extremely important to correct because sailors from all over the world relied on this book. If a calculation was incorrect, it could force a ship to sail off its chosen course and to potentially crash on an unknown reef or island. This was a dangerous situation that needed rectifying. After his first voyage when Nathaniel began to discover these mistakes, he was approached by a publisher from Newburyport and asked if he would review the entire book and correct the mistakes. From that time on, Nathaniel Bowditch was known as the author of The New American Practical Navigator, a book that was published for years and years to come. The United States Navy made reading this book mandatory for its officers. Many ships set sail for foreign lands with a copy of The New American Practical Navigator onboard, only sailors referred to it as simply "the Bowditch." After years of working on the corrections in Moore's book, Nathaniel recorded over eight thousand errors in the original charts and calculations. His contribution to the age of sail is immeasurable; think of all the lives The New American Practical Navigator must have saved.

The life of a sailor during this period of history was a difficult, dangerous, and lonely life. Sailing trips lasted for a year or more. Although Nathaniel occupied his time onboard every trip he took by studying and teaching the crew about navigation and astronomy, as well as spending time correcting the calculations in Moore's book, there were always thoughts the people back home. Before his first voyage on the *Astrea* Nathaniel met and fell in love with Elizabeth Boardman, the daughter of Captain Francis Boardman who lived in a great white house on the Salem Common. When Nathaniel returned from that voyage, he and Elizabeth were married on March 25, 1798. Sadly, while Nathaniel was away on his next voyage, Elizabeth died on

October 18, 1798 at the age of eighteen. Although Nathaniel, as husband to Elizabeth, inherited the great white house, he refused to take ownership and returned the property to Mrs. Boardman. Mrs. Boardman asked Nathaniel to please remain living in the house, and so he did. In 1800 after his fourth voyage, Nathaniel then married his cousin Mary Ingersoll. Again, Mrs. Boardman asked Nathaniel to continue to live in the house on the Common with Mary who had been a great friend to Elizabeth. He and Mary stayed there and in November of 1802, Nathaniel left for his fifth and last voyage.

When Nathaniel returned from his voyage as Captain of the *Putnam*, he was immediately offered a job as President of the Essex and Marine Insurance Company. He held this position in Salem until 1823 when he moved his family to Boston to become the actuary of the Massachusetts Hospital and Life Insurance Company as well as President of Commerce Insurance Company.

Dr. Bowditch

During this time, Nathaniel Bowditch was awarded an honorary doctorate from Harvard College; a school he had dreamed of attending as a child and whose hopes of that happening were squashed when his father indentured him to Ropes and Hodges' ship chandlery. From then on Nathaniel was known as Dr. Bowditch. This was quite an accomplishment for a poor boy with very little school who taught himself nearly everything he knew. On several occasions Nathaniel was offered positions to teach mathematics at Harvard, West Point, and the University of Virginia, some of the best schools in the country. He declined all of these important positions but did become a member of the overseers' board and treasurer of Harvard College where he was instrumental in reorganizing their financial systems.

Nathaniel continued to study and learn. He published numerous scientific articles. It was at this time in his life that Nathaniel reached the height of his scientific scholarship. By using his knowledge of mathematics and astronomy, as well as his knowledge of foreign languages, Nathaniel translated into English the great work on astronomy, *Mécanique Céleste*, a book about astronomy by the Marquis de La Place. Nathaniel had begun reading these volumes while on board one of his sea trips, but did not publish his translation until he saved the money to publish his book himself. This was his most important work which brought him recognition and praise from the world's greatest scientific societies and organizations. This book described how the universe functioned; the mechanics of the heavens. Nathaniel not only translated this work, he explained the very difficult terms and process of how the planets and stars aligned and how gravity held each planet in place. He used all of the knowledge that he had taught himself throughout his entire life. With the knowledge he learned by studying so hard he was able to communicate to anyone who read this work the mysterious way in which the universe evolved and functioned. Just like on his first sea voyage when Nathaniel taught the crew of sailors how to take *lunars* and how to work out the mathematical computations, he now taught everyone about the stars and heavens.

Nathaniel Bowditch had a natural gift for the science of mathematics. This gift and his love of studying allowed him to travel around the world and meet people from different cultures at a time when travel was a very difficult and dangerous adventure. His abilities taught him about people and places, as well as about the seas and the stars, and he shared it with the world. For a poor boy from Salem who travelled to the ends of the earth and to the stars and back his was truly a remarkable life.

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