

The Dods Of Mendham, New Jersey

Among the most talented in the related fields of horology, instrument making and engineering in the late eighteenth and early nineteenth centuries were several members of the Dod family of Mendham, New Jersey. The Dods were third and fourth generation descendants of Daniel Dod, who had migrated from England to Branford, Connecticut, in about 1645.

The first to achieve lasting note were two great-great-grandsons of the first Daniel Dod. Although the family was in straitened circumstances, the father, Stephen Dod, provided a good education for his sons. The oldest, Lebbeus (1739-1816), was born in Newark. When he was six, his family moved to Mendham, in Morris County. His younger brother, Thaddeus (1740-1793), was to become a well known pioneer Presbyterian clergyman and educator who opened the first classical school west of the Alleghenies in 1782.

Lebbeus was professionally trained as a clockmaker, probably having served an apprenticeship with an established craftsman in Newark. Soon after he attained legal age he married Mary Baldwin, and they became the parents of three daughters and four sons. Three of the sons were also to become clockmakers and instrument makers.

In addition to making clocks, Lebbeus worked as a farmer, maker of mathematical instruments, land surveyor and gunsmith. He was also involved in community activities; the record books of Mendham note his being paid by the community in 1765, 1767 and 1770 for "taking up strays."

In the late 1770s, Lebbeus and his brothers Thaddeus and Daniel left with their families to settle in the Redstone country of Pennsylvania; there Lebbeus hoped to establish himself as a clockmaker, instrument maker and land surveyor. The American Revolution was already in progress, however, and they were delayed in the northern part of Virginia for some two years due to Indian troubles incited by Tories and the British. When it was once more safe to travel,

Thaddeus and Daniel went on to settle in western Pennsylvania. Lebbeus decided not to join them, returning instead with his family to Mendham.

Lebbeus served as an armorer in the Continental Army until the end of the American Revolution, demonstrating considerable skill, and achieved the rank of captain in the artillery. He distinguished himself at the skirmishes at Springfield and Elizabethport, but saw little other active service because he was detached by Gen. Washington to form an armory for the repair and manufacture of muskets. He maintained the armory at a mill next to his house. He died in Mendham on March 31, 1816.

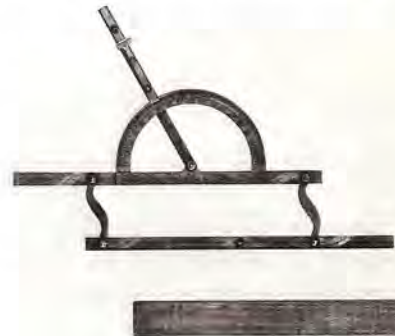
Only a few of the clocks and instruments made by Lebbeus are now known. Among them is a surveying compass in the National Museum of American History of the Smithsonian Institution; a calculating compendium in the American Wing of the Metropolitan Museum of Art in New York City; a protractor with parallel rule in the New Jersey State Museum at Trenton; and a combined protractor and divider in the Smithsonian's collections.

Of the next generation, Stephen Dod (1770-1855), one of Lebbeus' older sons, had been trained by his father as a clockmaker, instrument maker and land surveyor, but went on to specialize as a watchmaker and silversmith. In about 1800, Stephen joined with younger brothers Abner and Daniel in establishing a cotton machinery factory in Mendham. They had just achieved success in their enterprise when

**Combined
protractor and
dividers made
by Lebbeus
Dod.**

the immense importation of foreign goods following the end of the War of 1812 brought about a depression in domestic manufactures, resulting in the total loss of their investment.

From 1807 to 1812, Stephen served as representative from Morris County to the New Jersey Assembly. In 1817, following the demise of the cotton machinery enterprise, he moved to Newark. There he combined his business talents by engaging in real estate and land surveying. He represented Essex County in the state Assembly for a number of years and was the Speaker Pro-tem during the session of 1837. In Newark he served as justice of the peace and city surveyor, and in 1844 he was mayor of the community. His



Parallel rule with protractor and plotting scale. Made for Henry Van Allen by Lebbeus Dod.





National Park Service

The mine surveying compendium shown open for use.

maps of Newark, drawn from his own surveys, were published in all the city's directories from 1847 to 1863. Stephen died on March 28, 1855.

After the failure of the cotton machinery factory, Abner moved to Newark, where he established himself as a maker of mathematical instruments. A plain surveying compass signed "A. Dod" with its original field case is privately owned in Greenville, Ohio.

Daniel, one of Lebbeus' younger sons, proved to be a man of exceptional talents. Born on September 8, 1778, at Patter-son's Creek in the northern part of Virginia, he followed in his father's footsteps by working as a clockmaker, maker of mathematical instruments and professional surveyor. He was also a bell founder (one who casts bells) and inventor, but it was as a designer and maker of steam boilers and steam engines that he achieved lasting fame.

Trained at an early age by his father (as had been his brothers) as a maker of clocks and mathematical instruments and in surveying, young Daniel was reported by contemporaries to be a man "of rare mathematical and mechanical genius," having extensive acquaintance with theoretical and practical mechanics. After attending public schools, he entered Queens College (now Rutgers University). Upon completing his college education around 1810, his recognized superiority in mathe-

matics brought him the offer of the chair of mathematics at the College, although he refused. In 1801, he married Nancy Squire, the sister of Doctor Ezra Squire of Caldwell, New Jersey. In time he became the father of three daughters and five sons, all of whom survived him.

The diversity of Daniel's activities as a young man are reflected in the fact that he cast a bell weighing 289 pounds for the Newark Court House. It proved to be too



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Detailed view of the dial of the mine surveying compendium. The spirit level is broken.

small, however, and around 1811 he sold it for \$80 to the First Presbyterian Church in Horseneck-Caldwell, New Jersey, for its meeting house.

Daniel had joined his brothers Stephen and Abner in the cotton machinery venture soon after his graduation from college. In 1811 the Dod brothers manufac-tory was visited by Col. Aaron Ogden (1756-1839), a lawyer who was a former senator and governor of New Jersey. Ogden was greatly impressed with the ingenuity

of the Dod brothers' machinery, most of which had been designed by Daniel. He asked Daniel about constructing a steam engine. The subject of steam navigation had interested Dod for some time and he agreed to attempt it. In a short time he produced for Ogden an operating model of a steam engine similar in essential details to those of modern times.

The success of his first venture led Daniel to continue experimenting with steam engines and boilers. On November 29, 1811, he was granted a patent for the invention of a new boiler and condenser for use on steamboats as well as for the arrangement and location of the component parts of the power mechanism for steamboats. This patent covered double-impulse engines; the condenser included was made of a pipe or pipes connected together, and it condensed steam within the pipes by immersing them in cold water. The invention incorporated paired wheels driven by a lever beam. Steam was generated by two boilers, each reinforced and supported by rods and braces.

On May 12, 1812, Daniel Dod obtained another patent for his method of steam propulsion for vessels, covering four pro-pelling wheels instead of two, requiring the driving of double sets of machinery from one steam engine. The patents granted for his inventions of "steam engines" included boilers and condensers for use in steamboats as well as in mills. His engines operated somewhat on the principle of the Watt steam engine.

Ogden was greatly impressed with Dod's ingenuity and invited him to join in a new enterprise to manufacture steam engines for boats he was planning to operate on Lake Ontario and out of Philadelphia, Norfolk, Mobile and New Orleans. A partnership was formed in 1812, with Dod contributing his patents. The partners purchased the manufactur-ing rights to John Fitch's steamboat machinery from Fitch's heirs, and Dod moved with his family to Elizabethtown (now

Collectors Corner

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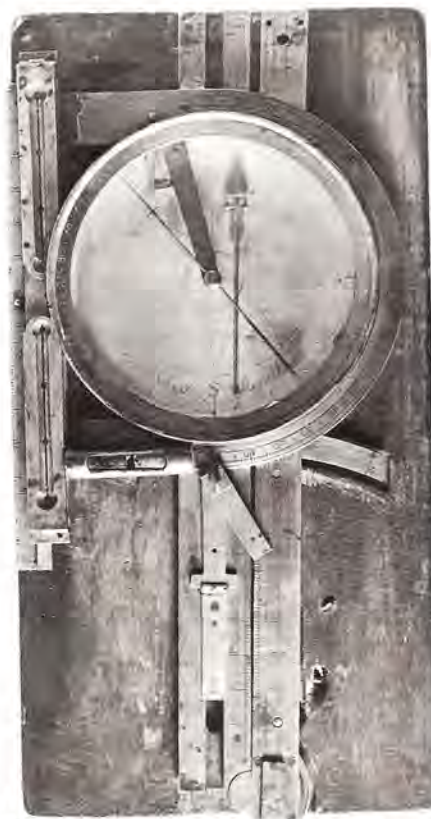
Elizabeth, N.J.) where he and Ogden erected shops and began manufacturing steam ferryboats.

Their first product was an engine designed by Dod for the steam ferry boat "Sea Horse." The 75-foot vessel was built by Cornelius Joralemon of North Belleville on the Passaic River, and during 1811 Dod built the machinery for it from his own design. The "Sea Horse" was placed in service in 1813, in the ferry service owned by Ogden operating between Elizabethtown Point and New York City, a distance of 14 miles.

The success of the "Sea Horse" was responsible for generating the famous controversy that developed between Robert Livingston and Robert Fulton of New York, and Ogden and Dod of New Jersey, as to the rights to navigate the waters of New York. The legislatures of both states subsequently became engaged in the quarrel, enacting laws assigning either monopolies or rights. Because it was running to New York, the "Sea Horse" was libeled by the Fulton monopoly, and to avoid further conflict, Ogden operated it from Elizabethtown Point to Jersey City instead. At its next session, the New Jersey legislature enacted a bill granting Dod exclusive rights to steamboat navigation in Jersey waters for five years by virtue of his inventions and as a representative of the rights of John Fitch, which he had purchased. For the next five years, until 1818, the partners continued to produce steamboat machinery for boats in other waters as well, including Lake Ontario, Philadelphia, Norfolk, Mobile and New Orleans.

The conflict with the Livingston-Fulton monopoly continued, however. Under the New Jersey bill, Dod and Ogden seized the New York steamboat "Raritan" operating at New Brunswick. When the case was tried the following year, the New Jersey bill was declared unconstitutional by the Court of Errors, upholding the Livingston-Fulton monopoly and barring Ogden's and Dod's boats from New York waters.

The New Jersey legislature's attempts at reprisals were unsuccessful, so in 1815 Ogden was finally forced to succumb to the monopoly and pay heavy costs for a



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The compendium fitted in its field case.

ten-year monopoly of steam navigation between Elizabeth and New York. This brought him into conflict with the ferry line established by his rival Thomas Gibbons. The case was fought in the courts and Ogden succeeded, only to have the decision reversed by the U. S. Supreme Court in 1824, which opened steam navigation to all who wished to engage in it. The costly, drawn-out legal battle, which greatly agitated the public mind at the time, totally dissipated Ogden's fortune.

Undoubtedly Dod's greatest contribution to steam navigation was the design and production of the machinery for the steamboat "Savannah," which crossed the Atlantic in 1819. The heavier parts of the machinery were cast at Stephen Vail's Speedwell Works in Morristown, and Dod designed and built the rest of it. It was the first steam vessel to make a trans-Atlantic voyage and to return safely after visiting England and Russia.

Despite their successes, the Ogden-Dod business was not lucrative, and in 1818 the partnership was dissolved. Dod

retained the manufacturing plant, and Ogden kept the ferry operation. Trusting Ogden's honesty, Dod was slow in drawing up title to the land on which the plant was situated, and when Ogden became involved with Gibbons, as an act of friendship he endorsed notes for Ogden's ferry service. When Ogden failed and went into bankruptcy, Dod's works also were seized. This loss, together with the earlier problems, forced Dod late in 1819 to turn over all his property to his creditors, a total loss assessed at \$90,000.

His creditors were so impressed with Dod's honesty in insisting on signing over all his property that they agreed to sell back to him all his tools for the nominal sum of \$1,000. Friends in New York came to Dod's rescue with loans of money, and he was able to re-purchase all his tools. Of the few known surviving documents relating to the partnership is an order written by Dod to Ogden on November 1, 1820, requesting that he "Pay to Mr. John Youle or order two thousand dollars out of any money due to me from you." In that year Dod established himself in business again in New York City and was reported to have become the most successful steam engine builder in the United States.

Three years later, he was called upon to examine some defect in the operation of machinery which he had modified for the steamboat "Patent." He went aboard for a trial trip on the East River. The boiler exploded and Dod was injured so seriously that he died several days later, on May 9, 1823, at the age of 45.

Throughout his life, even while engaged in his steamboat enterprise, Dod continued to make clocks and mathematical instruments, several of which have survived. Two clocks made by Daniel Dod are presently known, one in his native Mendham and another in California. Notable among the instruments he made is an unusual mine surveying compendium of his own design which he produced to order for Richard Loveridge prior to 1812, while still living in Mendham. This instrument, in its original field case, is presently in the Fort Laramie National Historical Site in Wyoming. **PS**

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