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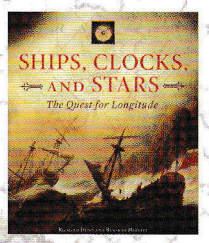

Ships, Clocks, and Stars: The Quest for Longitude
Richard Dunn and Rebekah Higgitt
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Ships, Clocks & Stars

THE QUEST *for* LONGITUDE

MARCH 19–AUGUST 23, 2015

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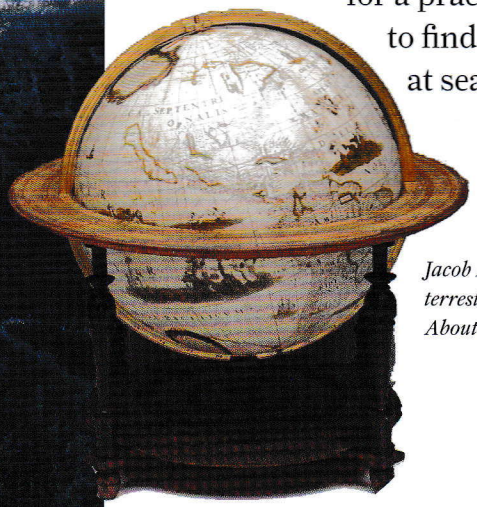
From Lost to Found

It's simple enough, and sometimes risky, to get lost on dry land. For centuries, it was easier and far more dangerous to be lost at sea. One of the great challenges was finding the ship's east-west position, or longitude. With its location unknown, a ship might sail into distant waters or abruptly run aground, sometimes with the loss of all aboard.

Ships, Clocks & Stars recalls the decades-long effort to change all that, sparked by the British Longitude Act of 1714. The law offered great rewards for a practical way to find longitude at sea.



Jacob Aertsz. Colum, terrestrial globe. About 1640. NMM.

John Harrison's masterpiece, the "H4," which solved the puzzle of telling time at sea. 1755-59. NMM.

Produced for the 300th anniversary of the Longitude Act by the National Maritime Museum in Greenwich, London, the exhibition uses rare timekeepers, instruments, paintings, and more to tell the story of the quest for longitude. Together, these materials show how clockmaker John Harrison, German astronomer Tobias Mayer, and others played key roles in the ultimately successful quest—and changed the world.

A commercial shop figure holding an octant, used in finding longitude. Late 1700s or early 1800s. NMM.

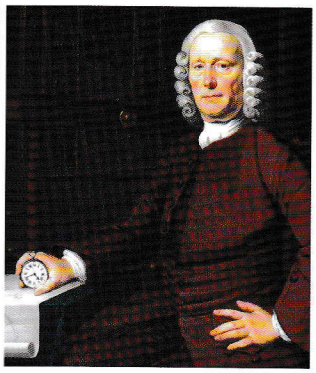
An Influential Act

The problem of finding longitude on a moving ship at sea was so daunting that it went unsolved for centuries. By the time of the 1714 Longitude Act, there were already well-known theoretical ideas for finding longitude on a ship. Making any of them work in real life, however, would take decades.

The Royal Observatory, Greenwich, from the south-east *(detail). About 1770. NMM.*

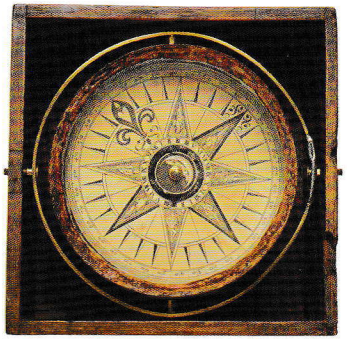
Seeking the Solution

Most approaches to calculating a ship's longitude required precise measurements of time, either with a device on the ship or by observing the movements of the moon and stars, or the moons of Jupiter. Yet there was still no timekeeper that worked accurately at sea. Astronomers also had not found a way to calculate time, and thus longitude, based on the "lunar distances" between the moon and stars. Moreover, instruments used to observe the positions of the objects in the night sky were far too imprecise.

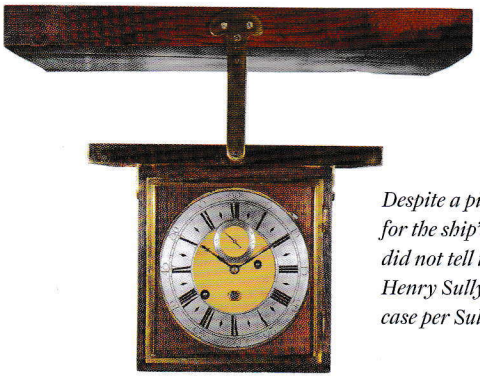


Thomas King, John Harrison. *About 1765–66. Science Museum / Science & Society Picture Library.*

John Harrison, a gifted clockmaker and carpenter who worked with the support of London clockmaker George Graham, built extremely advanced marine timekeepers, each one requiring years to construct. The Board of Longitude supported his efforts with payments, even when his third timekeeper took Harrison 19 years to complete. In 1759, he completed his masterpiece and fourth timekeeper—now called H4.



Jonathan Eade, mariner's compass. About 1750. NMM.



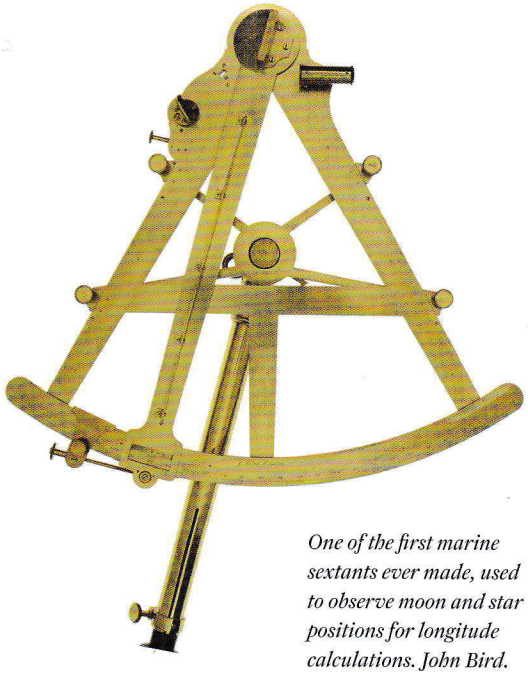
Despite a pivoted mounting to allow for the ship's motion, this timekeeper did not tell time accurately at sea. Henry Sully. Movement about 1724, case per Sully's design. NMM.

Meanwhile, in the mid-1750s, a German astronomer named Tobias Mayer found a way to calculate longitude from lunar distances—in effect, solving a problem that had defeated Sir Isaac Newton. The development and use of Mayer's tables went hand in hand with the invention of better observing instruments.

A Three-Way Test at Sea

In 1763 and 1764, half a century after the Longitude Act, the Board of Longitude held a major sea trial of the three most promising approaches to longitude: Harrison's H4 timekeeper, Mayer's lunar tables, and a marine chair designed for observing Jupiter's moons.

The chair was ineffective, but both Harrison's H4 and Mayer's updated tables (submitted by his widow after his recent death) passed with flying colors. Parliament gave significant rewards to Harrison and to Mayer's family, although disputes arose between Harrison and the Longitude Board over the amount he received and the final conditions.

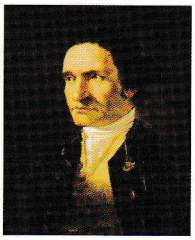


One of the first marine sextants ever made, used to observe moon and star positions for longitude calculations. John Bird. About 1758. NMM.

The Longitude Era

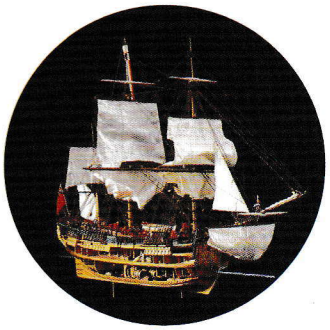
Still more work and time were needed to popularize the new methods, which transformed the seafaring professions. The Astronomer Royal, Nevil Maskelyne, directed the production of annual astronomical tables for use at sea, a massive task. Simpler, more affordable chronometers were developed, as were new methods of producing observing instruments. Prominent British naval officers like Captain Cook and Lieutenant Bligh tested the astronomical methods and the next generation of timekeepers on long voyages, in turn introducing the new navigation to other sailors.

Gerard van der Puyl, Nevil Maskelyne. *1785. The Royal Society.*



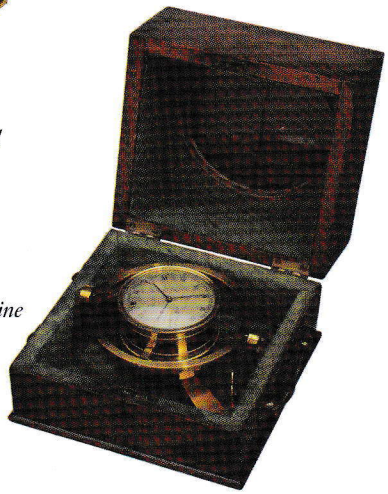
William Hodges, Captain James Cook, *1775–76. NMM.*

As the era of longitude began, faster, more predictable long-distance sea travel expanded British commerce and seapower. And, just as planned, ships, cargo, and lives were far less likely to be lost at sea.



Cook's vessel on his first Pacific voyage. Robert A. Lightley, model of the Endeavour. *About 1973. NMM.*

Internal movement of the "K1" timekeeper, a meticulous copy of H4 made by Larcum Kendall and tested on Cook's second voyage. 1766–69. NMM.



Thomas Earnshaw, marine chronometer no. 512. About 1800. NMM.