Book Review

Longitude by Wire: Finding North America*, by Richard Stachurski, 2009. University of South Carolina. ISBN 978-1-57003-801-3. Hardback, 209 p.*
—Reviewed by Bryan Catlin, PLS

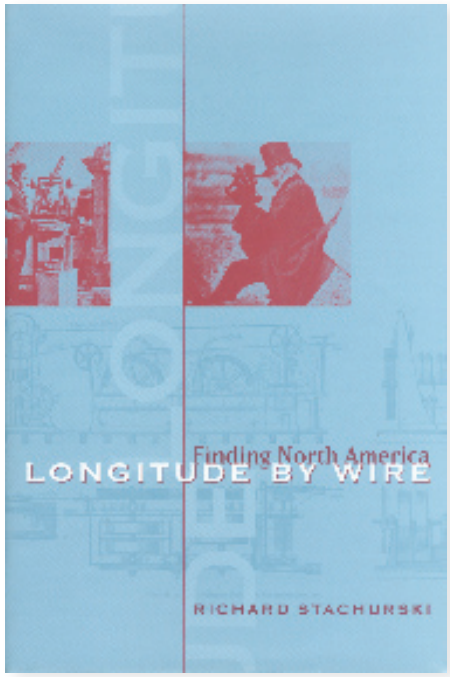
The United States Coast Survey, predecessor to the National Geodetic Survey, was created in 1807 to address a lack of reliable charts of the sea coast, which created problems for the defence and commerce of the young Republic.

Richard Stachurski's Longitude by Wire describes the enormous task that faced the Coast Survey in fulfilling this mission. The author draws attention to the emphasis given already then on following observation procedure as well as using proper instrumentation. Early but familiar triangulation and base line measurement procedures are described, including how secondary triangulation was used to establish accessible points for hydrographic data acquisition.

A chapter entitled "Station Buttermilk" describes the initial survey of a monument which the NGS web site lists as the oldest surviving first-order monument in the country.

The book really takes off when, as the title indicates, longitude determination was tackled. Other mapping tasks such as triangulation, baseline measurement, water depth soundings, location of topographic features, chart preparation, and azimuth and latitude determination were fairly well understood and implemented, some after improvements, by the Survey's surveyors. But determining the longitude of features—which could be off by miles—was more difficult.

Although conceptually simple



to understand—there is the difference in local time between two points—the inability to reliably compare those times was a huge obstacle to obtaining accurate longitudes.

Methods such as observing solar eclipses or the eclipses of the moons of Jupiter, or using the Earth's moon as a clock, and transporting chronometers between stations, all had problems with accuracy or were downright impractical.

The determination of longitude improved dramatically when in 1844, two weeks after Samuel Morse's successful experimentation with telegraph messaging, the first local time signals were transmitted over the telegraph line to determine the longitude difference between Washington and Baltimore. Refinements to the system—such as automating the clock signal and automatic recording of astronomical meridian observations and clock signals on a chart recorder in the telegraph circuit—quickly improved the convenience and accuracy of the process.

Not long after its debut, the "American Method" of longitude determination was being used wherever telegraph lines were installed between principal cities and, eventually, between countries and continents.

Those who enjoy learning about how our surveying predecessors obtained the results they did, and the conditions they faced performing their duties, will enjoy this narrative of how advances in science, math, and astronomy, and the government's role in supporting and utilizing these scientific fields in the 1800s, created the framework of the geodetic system we enjoy today. This book does a good job of describing the problems that were overcome, without dwelling on the math behind the procedures.

This 209-page hardback is well illustrated with black and white illustrations and photographs and includes an extensive set of notes along with a bibliography and an index.