

Galileo's rare treatise on his pioneering calculating device

Galileo Galilei , *Le Operazioni del Compasso Geometrico et Militare*.

Padua: privately printed, 1606. 12 inches x 7 7/8 inches (305 x 200 mm), 68 pages, foldout.

This manual detailing the “Operations of the Geometric and Military Compass” is one of Galileo Galilei’s rarest works. The enduring legacy of this Renaissance scientist’s pioneering investigations was the establishment of a mathematical formulation as the basis for research in the physical sciences.

The proving-ground for Galileo’s revolutionary experimental-mathematical methodology was the little machine shop he set up in his house in Padua. There he perfected or reinvented two recent devices, the geometric compass and the telescope, issuing a small volume on each. *Sidereus Nuncius* (“The Starry Messenger,”) was published in Latin so as to acquaint the learned across Europe with his telescopic discoveries. *Le Operazioni del Compasso Geometrico et Militare* appeared in Galileo’s native Italian, as befitted an instructional manual originally composed to accompany the device.

Patronage and politics ensured that a Renaissance scientist could no more ignore the study of ballistics than an architect neglect the techniques of fortification. The so-called “geometrical and military compass” (or sector) was a mathematical device—a sort of calculating ruler based on the principle of proportional magnitudes—that brought speed and accuracy to computations about armaments and their trajectories. The use of Galileo’s device, however, extended well beyond the battlefield. It was widely used for rapid and complex calculations of proportion, volume, and square or cube roots, well before the advent of logarithmic tables — and eventually the slide-rule and computer — all of which it presaged.

Galileo’s little book, privately printed in an edition of a mere sixty copies, is now extremely rare, with fewer than ten copies known to survive. This copy from the Lessing J. Rosenwald Collection at the Library of Congress is bound in contemporary vellum, with a lettering-piece of the same ivory gilt-

stamped “gal. | com. | geo.” on the spine. The rear cover bears mathematical sums in sepia ink in an unidentified hand.

Octavo code: galgal