



THE RITTENHOUSE ORRERY

*A MARVEL OF HISTORY,
SCIENCE AND CRAFTSMANSHIP*



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Praised by Thomas Jefferson, David Rittenhouse's 1771 Orrery is a model of the Newtonian universe named for Charles Boyle, Earl of Orrery, for whom an early "planetarium" was made around 1713. A cutting-edge mechanical wonder of its day, the Rittenhouse Orrery's elegant case was also the latest design. Today the orrery is an exquisite antique masterpiece that embodies the scholarship and history of the University of Pennsylvania, and the ingenuity and fine craftsmanship of colonial Philadelphia. The Rittenhouse Orrery is the Philadelphia Antiques Show's original emblem.

Portrait of David Rittenhouse by Charles Willson Peale, 1772, Oil on Canvas.
Courtesy of the University of Pennsylvania Art Collection.

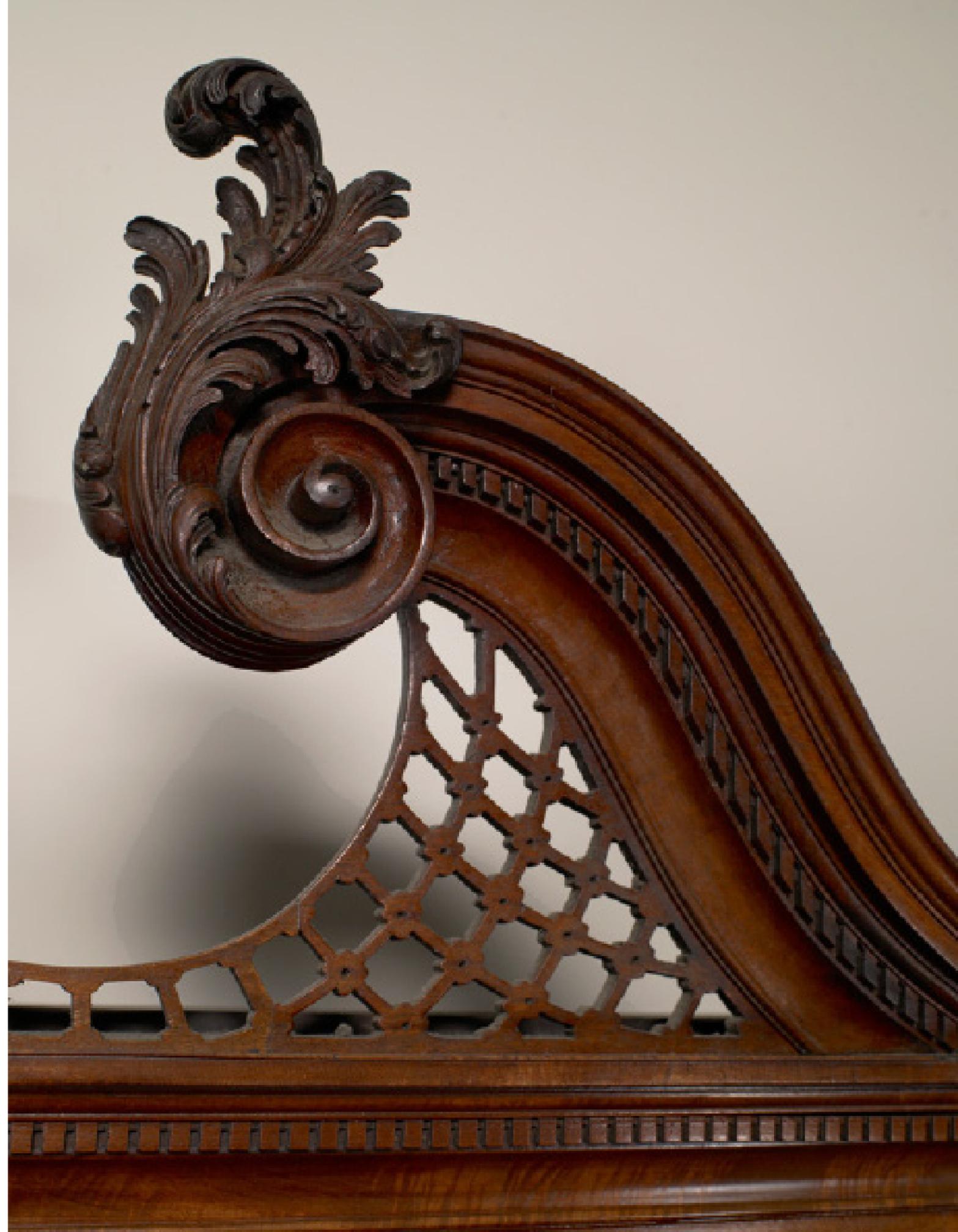
Acquired in 1771 by the College of Philadelphia (later to be renamed the University of Pennsylvania), the Rittenhouse Orrery or planetarium was a mechanical device for reckoning, viewing, and studying the motions of the known planets and their moons. The scientific principles upon which the planetarium was conceived are two: first, the revolutionary sixteenth-century Copernican observations and proofs that the earth rotated elliptically around the sun and that the moon rotated around earth; and, second, seventeenth-century Newtonian mathematical theory, which was used to measure and calculate the properties of the natural world and universe.

The College of Philadelphia was not the first mid-Atlantic college to purchase an orrery built by David Rittenhouse (1732-1796); the College of New Jersey (now Princeton) can make this claim. In hindsight, Philadelphia would benefit from Rittenhouse's agreement to a chagrined Provost William Smith of the College that he would build a second orrery. The first was begun in 1767 at the request of Smith. However he was outbid by John Witherspoon, the Provost of Princeton, in April 1771. Smith felt the pang of Rittenhouse's opportunism at the expense of his friend. Like Witherspoon, Smith was eager to acquire the Rittenhouse Orrery for the purpose of instruction and study at the College of Philadelphia in his planned course on Natural Philosophy, which included the field of astronomy. Smith's surviving lectures from the period affirm his familiarity with Newton's clockwork universe.

Unlike his highly educated friend Provost William Smith (1727-1803), first Provost of the College of Philadelphia, Anglican clergyman, and Professor of Ethics, David Rittenhouse was born in humble circumstances on the banks of Wissahickon Creek in Germantown where his grandfather, William Rittenhouse, built the first paper mill in America. (The area was known as Rittenhouse Town, and the original mill buildings still survive.)

The churning of the paper mill works must have made a profound impression on the formative mind of the young Rittenhouse. He was self-educated and by the time he was thirty, Rittenhouse was well-known locally as a clock and instrument maker, surveyor, astronomer, and mathematician. By the time of his death, he was honored internationally for his contributions to astronomy, and locally for his service to both the University of Pennsylvania and the newly formed national government of the United States.

The orrery made in 1771 for Philadelphia demonstrates the motions of the known planets in the center panel, the moon in the right panel, and moons of Jupiter and Saturn in the left panel (now missing). Comprised of hundreds of gears and driven by a crank, the orrery was conceived to demonstrate the motion of the planets for 5,000 years. Unlike designers of other orreries, Rittenhouse successfully displayed the elliptical rotation of the planets, which was an unsurpassed technical achievement. The Rittenhouse Orrery is housed in an elegant Chippendale cabinet





finely crafted in Philadelphia by John Holwell and Parnell Gibbs. The works and cabinet illustrate the sophisticated state of science, technology, and the practical arts in Philadelphia—the undisputed center of the American Enlightenment.

Owned by the university for over two hundred years, and in practical use for instruction for fifty years, by the end of the nineteenth century the Rittenhouse Orrery was an elegant mechanical relic of an earlier era of scientific practice and study. In 1888, the orrery was moved from obscurity to a place of prominence in the university's new state of the art academic library designed by Frank Furness. Moved a second time in 1962, the orrery was relocated to the Van Pelt Library where it continued to serve, as it had for two centuries, as the practical symbol of the university's intellectual spirit and scientific quest to create new knowledge.

In January 2013, the orrery made its ascent to its pride of place in the Penn libraries' new Kislak Center for Special Collections, Rare Books, and Manuscripts located on the sixth floor of the Van Pelt-Dietrich Library Center. Although the orrery's history and function is well documented, most contemporary visitors are daunted by its size and puzzled by its purpose. Still, the orrery commands awe and wonder for all who view this marvelous eighteenth-century astronomical teaching "apparatus."

Of its time, yet timeless, the Rittenhouse Orrery continues to serve as the supreme achievement of its creator, an American autodidact genius who was shaped by his family, period, acquaintances, politics, and his thirst to solve scientific problems and make discoveries that would lead to the advancement of knowledge and science expressed through innovation and technology.

Rittenhouse's carefully designed planetarium served a pedagogical purpose for the College of Philadelphia – to train students to study and observe the movement of matter across the night skies. Today, by comparison, it is not unlike the University of Pennsylvania's investment in the new science of nanotechnology that focuses its quest inwardly to identify and capture the behavior of unobservable programmed matter, which may lead to unimagined discoveries and remedies to the most complex scientific and medical problems that humanity faces today. ***

The Rittenhouse Orrery is housed in Special Collections Center, The University of Pennsylvania Libraries. Art Collection of the University of Pennsylvania.

