Biographical Encyclopedia of Astronomers

Ricci, Matteo

Born Macerata, (Marche, Italy), 6 October 1552

Died Beijing, China, 11 May 1610

Matteo Ricci carried out an astonishingly successful mission to Chinese scholars during which he greatly improved the maps of China and introduced Euclidean geometry and trigonometry there.

Ricci's parents were Giovanni Battista Ricci and Giovanna Angiolelli. Matteo entered the Jesuit order in 1571, and after his courses in rhetoric, philosophy, and theology, he studied mathematics at the Roman College under Christoph Clavius

In 1577, Ricci departed from Rome to join the Jesuits working in China and arrived there in 1583, where he worked for 27 years. He first opened a residence in Nanjing for himself, his fellow Jesuits, and his scientific instruments. (For a time, suspicious landlords would drive Ricci and his companions from their dwellings, until they hit on the plan of renting haunted houses; then no one bothered them.) Gradually, Ricci was welcomed to the academies and gained many influential friendships. Later, he became the court mathematician in Beijing, and there he stayed for the rest of his life

Jesuits were practically the sole source of Chinese knowledge about western astronomy, geometry, and trigonometry. Appointments in the Astronomical Bureau provided the Jesuits with access to the ruling elite, whose conversion was their main objective. Mathematical and astronomical treatises demonstrated high learning and proved that the missionaries were civilized and socially acceptable.

Matteo Ricci brought trigonometry to China, where it had remained in a primitive form until the Jesuits arrived. Ricci's successors, Ferdinand Verbiest and Johann Schall von Bell, used geometric and trigonometric concepts to revolutionize the sciences of astronomy, the design of astronomical instruments, mapmaking, and the intricate art of creating accurate calendars.

The Jesuits were inventive mapmakers and were continually traveling throughout the empire of China, even though travel conditions were quite inconvenient. The *Philosophical Transactions of the Royal Society* recounts 52 such journeys by Ricci and Verbiest alone

Ricci designed and displayed a great world map, which brought about a revolution in traditional Chinese cosmography. For the first time, the Chinese had an idea of the distribution of oceans and landmasses. This was the beginning of his major contribution to the diffusion of knowledge through his more than 20 works in Chinese on topics such as mathematics and astronomy.

For 20 years, Ricci tried to reach the emperor in person, but the emperor was a recluse not accustomed to seeing even his own people. Then, unexpectedly, the emperor summoned Ricci and his companions to inquire about a ringing clock brought to him by the Jesuits. His own

scientists had failed to fix it when it stopped. Since the emperor could not receive these foreigners in person, he had an artist draw full-length portraits of them so that they could have a vicarious interview

Another opportunity arose during a solar eclipse: The prediction of the expected time and duration made by the emperor's own Chinese astronomers differed considerably from the Jesuit prediction. When the latter prediction proved correct, the position of the Jesuit mathematicians was secure. It is interesting that the Jesuits taught the Chinese the heliocentric theory, unaware that Galileo Galilei's trial had taken place and that it had been forbidden by Rome to be taught as a proven fact. There was a communication lag of more than five years

Ricci's books *Geometrica Practica* and *Trigonometrica* were translations of Clavius's works into Chinese. In 1584 and 1600 he published the first maps of China ever available to the West. As an author, the Chinese geometrical works for which Ricci is remembered were books on the astrolabe, the sphere, measures, and isoperimetrics. But especially important was his Chinese version of the first six books of Euclid's *Elements*, which was written in collaboration with one of his pupils and entitled *A First Textbook of Geometry*

The prestige Ricci gained in the highest cultural spheres through his wisdom, scientific knowledge, and capacity for philosophical speculation won him a hearing when he spoke of the gospel message. Without any trace of superiority in his manner, he used a process of dialogue that was characterized by esteem and respect for everyone. Ricci's success was due to his personal qualities, his complete adaptation to Chinese customs (choosing the attire of a Chinese scholar), and his authentic knowledge of mathematics, physics, and astronomy. (His works included Chinese texts on religious and moral topics, as well as writings on scientific topics.) It is still possible to visit Ricci's 8-foot-high tomb in the Beijing suburbs.

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