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(*b*. Padua, Italy, 13 June 1555; *d*. Bologna, Italy, 11 February 1617)

mathematics, astronomy, geography, cartography.

Magini graduated with a degree in philosophy from the University of Bologna in 1579; in 1588 he was appointed to one of the two chairs of mathematics there, having been preferred for that post to his younger contemporary Galileo. (The other chair was held by Pietro Cataldi, a mathematician of great prestige.) Magini alternated lectures on Euclid with classes in astronomy, which, stimulated by his passion for astrology, was actually his chief scholarly interest. Astrology itself had been taught at Bologna since 1125. Its study produced results occasionally useful to astronomers, as, for example, the more accurate calculation of celestial movements. Magini wrote several astrological works that were admired in their time, and also served the Gonzaga prince of Mantua as judicial astrologer (with varying results). For this reason he spent long periods of time in that city.

Like his astrological works, Magini's writings on astronomy remain of only historical interest, due in large part to his adherence to Ptolemaic principles. He rejected the Copernican theory, which was then being vindicated by Galileo; the conservatism of his thought indeed made him Galileo' enemy, and Magini more or less openly lent his support to libels against the younger man. Within the boundaries of his Ptolemaicism, Magini drew up complex theories, among them the multiplication of Ptolemaic spheres and orbits, and also performed some useful calculations. He was, in fact, much more skilled in calculation than in theory, and his ephemerides remained valid for a long time.

Magini's mathematical work was essentially practical. In 1592 he published his *Tabula tetragonica*, a table of the squares of natural numbers which was designed to permit the determination of the products of two factors as the difference between two squares. In 1609 he brought out extremely accurate trigonometric tables, in which he introduced new terms for what are now called cosines, cotangents, and cosecants. Magini's nomenclature enjoyed some currency, and was later adopted by Cavalieri, who succeeded him at Bologna. Magini made further contributions to practical geometry, including works on the geometry of the sphere and the applications of trigonometry, for which he invented certain calculating devices that may be reconstructed from his texts. Of his lectures on Euclid, some notes relating to the third book are extant in the Ambrosian Library in Milan.

Although Magini's fame in his own century rested upon these and other accomplishments (including his studies on mirrors and especially the concave spherical mirrors that he fabricated, one of which he presented to the emperor Rudolf II), he is today remembered chiefly as a geographer and cartographer. One of his earliest works was a commentary on Ptolemaic geography, in which he took up the problem of the topographical representation of the earth. He then embarked upon the ambitious project that, with interruptions, occupied him the rest of his life—an atlas of Italy, providing maps of each region (showing the borders of each state) with exact nomenclature and historical notes. The most complete edition of this atlas was published by his son, Fabio, in 1620, three years after Magini's death. Unfortunately, even this edition represents only a small part of Magini's actual work, since his notes for a greater volume, together with much of his library (particularly astrological works), were confiscated by the Roman Inquisition and apparently lost or destroyed.

BIBLIOGRAPHY

I. Original Works. Magini wrote in Latin and most of his works were then translated into Italian. The major works are *Ephemerides coelestium motuum* (Venice, 1582); *Novae coelestium orbium Theoricae congruentes cum observationibus N. Copernici* (Venice, 1589); *De planis triangulis liber unicus et de dimitiendi ratione per quadrentem et geometricum quadratum libri quinque* (Venice, 1592); *Tabula tetragonica, seu quadratorum numerorum cum suis radicibus* (Venice, 1592); *Geographiae universae* (Venice, 1596); *Tabulae primi mobilis, quas directionum vulgo dicunt* (Venice, 1604). His later works include *Continuatio Ephemeridum coelestium motuum* (Venice, 1607); *Ephemeridum coelestium motuum, ad anno Domini 1608 usque ad annum 1630* (Frankfurt, 1608); *Tabulae generales ad Primum Mobile spectantes, et primo quidem sequitur magnus canon mathematicus* (Bologna, 1609); *Breve instruttione sopra l'apparenze et mirabili effetti dello specchio concavo sferico* (Bologna, 1611); *Geographiae universae* (Venice, 1616); *Tabulae novae iuxta Tychonis rationes elaboratae*(Bologna, 1619); and his atlas, *Italia* (Bologna, 1620).

II. Secondary Literature. The best biography of Magini is A. Favaro, *Carteggio inedito di Ticone Brahe, Giovanni Keplero e di altri celebri astronomi e matematici dei secoli XVI e XVII con Giovanni Antonio Magini* (Bologna, 1886). Other works are R. Almagia, *L'Italia di G. A. Magini e la cartografia dell' Italia nei secoli XVI e XVII* (Naples, 1922); and G. Loria, *Storia delle matematiche* (Milan, 1950), pp. 380, 400, 422–425.

Luigi Campedelli