Sluse, René-François De | Encyclopedia.com

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(*b*. Visé. Principality of Liège [now Belgium], 2 July 1622; *d*. Liège, 19 March 1685)

mathematics.

Although the family name is variously spelled in the archives and documents, its correct form is de Sluse in French and Slusius in Latin. Sluse was a nephew of Gualthère Waltheri, secretary of papal briefs to Innocent X. Destined by his well-to-do family for an ecclesiastical career. Sluse went to Louvain in the fall of 1638 and remained through the summer of 1642. In 1643 he obtained a doctorate in law from the University of Rome. He lived in Rome for ten years more, becoming proficient in Greek, Hebrew, Arabic, Syriac, and astronomy. But his natural gifts led him to mathematics and a thorough study of the teachings of Cavalieri and Torricelli on the geometry of indivisibles.

On 8 October 1650, Innocent X appointed Sluse canon of the cathedral of Liège. His understanding of law and his great knowledge brought him many high positions. But his success in the administration of a small state severed him from the life he had known in Rome and thrust him into an intellectual vacuum; and his administrative duties left him little leisure for scientific work, particularly after 1659, when he became a member of the Privy Council of Prince-Bishop Maximilian Henry, who was also elector of Cologne. The only way That Sluse could survive as a scientist was, according to the practice of the time, to conduct an extensive correspondence with the leaders of mathematical studies: Blaise Pascal, Huygens, Oldenburg, Wallis, and M. A. Ricci,

In June 1658, Pascal, under the name of A. Dettonville, challenged mathematicians to solve a number of problems related to the cycloid. The evaluation of the area between a cycloid and a line parallel to its base, and the calculation of the volume generated by a rotation of this area around the base or around a line parallel to the base, were among the problems proposed, and already solved, by Pascal. In his work on the cycloid (1658) Pascal paid homage to the elegance of the solutions Sluse had sent to him, and the two remained regular correspondents. In his correspondence with Pascal, Sluse discussed the areas limited by curves corresponding to the equation

$$Y^m = Kx^p \, (a - x)^n$$

and the cubature of various solids; and as an example he found the volume generated by the rotation of a cissoid around its asymptote. These questions were discussed in his *Miscellanea*, published in 1668 as a section of the second edition of his *Mesolabum*.

One of the questions widely studied by the geometers of Greek antiquity was the duplication of the cube, that is, the construction of a cube of a volume double that of a given cube. This led to the solution of a cubic. More generally, Sluse discussed the solutions of third-and fourth-degree equations. Descartes had shown that their solution corresponds to the intersection of a parabola and a circle, and Sluse demonstrated that any conic section can be substituted for the parabola. He developed his method in *Mesolabum* (1659), particularly in the second edition.

In his *Géométrie,* Descartes had demonstrated the application of geometrical loci to the solution of equations of higher degrees. Sluse was among those who perfected the methods of Descartes and Fermat to draw tangents and determine the maxima and minima. By completing Descartes's construction for the solution of third- and fourth-degree equations and using a circle and any conic section, Sluse generalized the method for the solution of equations through the construction of roots by means of curves. In 1673 he published a digest of the results of his work in the *Philosophical Transactions* and became a member of the Royal Society in the following year.

The discovery of a general method for the structiton of tangents to algebraic curves places Sluse among the pioneers in the discovery calculus. At Huygens' suggestion, Leibniz learned analytical geometry through the writings of Sluse and Descartes. Sluse deserved the judgement formulated by Huygens in a letter to Oldenburg: "(Slusius) est geometrarum, quos novi, omnium doctissimus candidissimusque."

Sluse was also a historian and wrote a book on the death of St. Lambert, the bishop of Tonges, who was killed on the spot to which St. Hubert, his successor, transferred the seat of his bishopric (which became Liège). Another historical study concerns the famous bishop of Maastricht, St. Servatius. Among his unpublished manuscript is a history of Cologne.

The breadth of Sluse's interests is attested by the variety of subjects covered in the hundreds of pages of his unpublished manuscripts now preserved at the Bibliothèque Nationale, Paris. Although concerned mainly with mathematics, they also treat astronomy, physics, and natural history.

BIBLIOGRAPHY

Sluse's writings include *Mesolabum seu duae mediae proportionales inter extremas datas per cireulttm et ellipism vel hyperbolam infinitis modis exhibitae* (Liège, 1659; 2nd ed., enl., 1668): "An Extract of a Letter From the Excellent Renatus Franciscus Slusius, Canon of Liège and Counsellor of His Electoral Highness of Collen [Cologne], Written to the Publisher in Order to Be Communicated to the R. Society, Concerning His Short and Easier Method of Drawing Tangents to All Geometrical Curves Without Any Labour of Calculation," in *Philosophical Transactions of the Royal Society*, **7** (1672), 5143–5147: "Illustrissimi Slusii modus, quo demonstrat methodum suam ducendi tangents ad quaslibet curvas...."*ibid*., **8** (1673), 6059; *De tempore et causa martyrii B. Lamberti. Tungnensis episcopi, diatriba chronologica et historica* (Liège, 1679): and *De S Servatio episcopo Tungrensi, ejus nominis unico: Adversus nuperum de sancto Arvatio vel duobus Servatiis commentum* (Liège, 1684).

M. C. Le Paige published more than 100 letters Sluse to Pascal, Huygens, Oldenburg, Lambeck, Sorbière and Pacichelli in "Correspondance de Renè-François de Sluse publicée pour la première fois," in *Bullettino di bibliagrafia e di storia delle scienze matematiche e fisiche*, **17** (1884), 494–726, and his introduction is the best available biography of Sluse. Secondary literature also includes C. Le Paige, "Notes pour servir à Thistoire des mathématiques dans l'ancien Pays de Liège," in Bulletin de l'Institut archéologique liègeosis, **21** (1890), 457–565; P. Gilbert, *René de Sluse* (Brussels, (1886); F. Van Hulst, *René Sluse* (Liège 1842); and L. Godeaux, *Esquisse d'une histoire des sciences mathématiques en Belgique* (Brussels, 1943).

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