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(*b*. West Kilbride, Ayrshire, Scotland, 14 October 1687; *d*. Glasgow, Scotland, 1 October 1768)

geometry.

Simson's father, Robert, was a prosperous merchant in Glasgow who had acquired the small estate of Kirktonhall in West Kilbride; his mother, Agnes, whose maiden name was also Simson, came from a family that had provided parish ministers for the Church of Scotland from the time of the Reformation. It was with the intention of training for the Church that Simson matriculated at the University of Glasgow in 1701. He followed the standard course in the faculty of arts (Latin, Greek, logic, natural philosophy) and then devoted himself to the study of theology and Semitic languages. During these years, one of his teachers was his maternal uncle, John Simson, professor of divinity. He also acquired a knowledge of natural history that was a source of pleasure to him throughout his life; it is interesting to note that until his death he was held by his contemporaries to be one of the best botanists of his time.

At this time no instruction in mathematics was given at the University of Glasgow. The chair of mathematics had been revived in 1691 and during the years 1691–1696 it was occupied by George Sinclair, a mathematician and engineer of some repute. On his death Sinclair was succeeded by his son, Robert, who flagrantly neglected the duties of his chair. Thus Simson had no formal tuition in mathematics. It would appear to have been through reading George Sinclair's *Tuyrocinia Mathematica in Novem Tractatus* (Glasgow, 1661) that Simson's interest in the subject was first aroused and it was this work that encouraged him to read Euclid's *Elements* (in the edition of Commandinus). He soon became absorbed in the study of geometry and acquired such a reputation as an "amateur" mathematician that in 1710 the senate of the university, having relieved Sinclair of his office, offered Simson the chair of mathematics. Simson declined the invitation on the grounds that he had received no formal training in mathematics; when the senate reaffirmed its confidence in his ability to discharge the duties of the chair, Simson suggested that the appointment be left open for a year, during which he would devote himself entirely to the study of mathematics.

Simson chose to spend the academic year 1710–1711 in London. He had originally intended to study in Oxford, but his efforts to make contact with mathematicians there were unsuccessful; so he spent the year at Christ's Hospital (the Blue Coat school), where, under the aegis of Samuel Pepys, a mathematical school had been founded for the purpose of training navigation officers for the Royal Navy. More important than the formal instruction that Simson received there were the personal relationships he established with several prominent mathematicians: John Caswell, James Jurin (secretary of the Royal Society), and Humphrey Ditton. He was most profoundly influenced by Halley, who had recently been appointed Savilian professor of geometry at Oxford while still a captain in the Royal Navy; not only was Halley regarded as second only to Newton in the field of scientific research, he was also a distinguished scholar (and editor) of the works of the Greek mathematicians.

While Simson was still London the senate of the University of Glasgow elected him (on 11 March 1711) to the chair of mathematics on the condition that "he give satisfactory proof of his skill in mathematics previous to his admission." On his return to Glasgow he submitted to a simple test and was duly admitted professor of mathematics on 20 November 1711.

At Glasgow, Simson's first task was to design a proper course in mathematics. The course extended over two complete academic years, each of seven months' duration; to each class he lectured for five hours a week. Although his own interest was entirely in geometry, he lectured on Newton's theory of fluxions; on Cartesian geometry, algebra, and the theory of logarithms; and on mechanics and geometrical optics. Among his students were Maclaurin, Matthew Stewart, and William Trail, all of whom subsequently occupied chairs of mathematics in Scottish universities.

Simson lived the rest of his life in rooms within the College of Glasgow; outwardly his life gave every appearance of being uneventful—so much so that it was highlighted only by the conferment upon him in 1746 of the M.D. (*honoris causa*) by the University of St. Andrews. In 1761 John Williamson was appointed his assistant and successor.

Simson's lifework was devoted to the restoration of "lost" works of the Greek geometers and to the preparation of definitive editions of those works that had survived. Halley had encouraged this predilection for the works of the Greek geometers. (Simson's classical education and his knowledge of oriental languages were especially useful to him.) He first turned his attention to the restoration of Euclid's porisms, which are known only from the scant account in Pappus' *Mathematical Collections*. Although Fermat claimed to have restored Euclid's work, and Halley had edited the Greek text of the preface to Pappus' seventh book, Simson is usually regarded as the first to have thrown real light on the matter. In a paper, "Two General

Propositions of Pappus, in Which Many of Euclid's Porisms Are Included" (*Philosophical Transactions of the Royal Society*, **32** [1723],220) Simson elucidated two general propositions of Pappus and showed that they contained several of the porisms as special cases. He continued to work on this topic throughout his life, but nothing further was published until *De porismatibus tractatus* appeared posthumously in 1776. Simson's only other genuine research paper, "An Explanation of an Obscure Passage in Albert Girard's Commentary on Simon Stevin's Works, p,. 169,170," appeared in 1753 (*Philosophical Transactions of the Royal Society*,**48** ,368).

Simson's book on conic sections (1735) used only geometrical methods. Although he was familiar with the methods of coordinate geometry—and lectured upon them—he developed the subject in the style of the classical Greek authors. His authoritative account of the *loci plant* of Apollonius appeared in 1749. But his most influential work was his definitive edition (1756) of Euclid's *Elements*. This edition was the basis of every subsequent edition of the *Elements* until the beginning of the twentieth century. Simson adopted the perhaps naive view that Euclid's treatise in its original form had been free from logical faults—any blemishes were regarded by him as being due to the bungling of editors such as Theon. Simson's restoration of Euclid's *Data* was added to his second edition of the *Elements* (1762).

A posthumous edition of Simson's unpublished mathematical works was published as *Opera Quaedam Reliqua R. Simson* (1776) at the expense of Philip Stanhope, second earl of Stanhope. It consists of four books: *De porismatibus tractatus; De sectione determinata; De logarithmis liber;* and *De limitibus quantitatum et rationum, fragmentum*. The last two books are based on his lectures to students; *De logarithmis* is a purely geometrical theory of logarithms. *De limitibus* is of great interest because it shows that Simson perceived that the fluxionary calculus of Newton rested on insecure foundations; accordingly, he attempted to place the theory of limits on a rigorous foundation. His failure lies probably in the fact that he tried to formulate the theory entirely in terms that would have been intelligible to a Greek geometer of the Alexandrian School.

simson's manuscripts contain a great variety of miscellaneous geometrical and many interesting reflections on various aspects of mathematical teaching and research, but none of it in a state for publication. He also prepared a draft of an edition of the complete works of Pappus that was based on material he had received from Halley many years earlier, and it is perhaps for this reason that a transcript was obtained by the Clarendon Press at Oxford.

On his death Simson bequeathed to the University of Glasgow his collection of mathematical books—at that time recognized as the most complete in the British Isles. They are preserved as the Simson Collection of the university library.

BIBLIOGRAPHY

I. Original Works. Simson's works include *Sectionum Conicarum Libri V* (Edinburgh, 1735; 2nd ed., enlarged, 1750); *Apollonii Pergaei Locorum Planorum Libri II, restituti a R. Simson* (Glasgow, 1749); *Elements of Euclid* (Glasgow, 1756), of which the 2nd ed. (1762) contained Euclid's *Data*; and *Opera Quaedam Reliqua R. Simson, James* Clow, ed. (Glasgow, 1776).

II. Secondary Literature. The best source is William Trail, *Life and Writings and Robert Simson* (Bath, 1812).

Ian N. Sneddon