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(*b.* Rothesay, Isle of Bute, Scotland, January 1717; *d.* Catrine, Ayrshire, Scotland, 23 January 1785)

*geometry, astronomy, natural philosophy.*

Stewart's father, Dugald, was minister of the parish of Rothesay; his mother was Janet Bannatyne. Intending to follow his father's career, he entered the University of Glasgow in 1734, soon coming under the influence of Robert Simson, professor of mathematics, and [Francis Hutcheson](#), professor of moral philosophy.

Simson was then attempting to reconstruct Euclid's lost book on porisms; and he communicated his enthusiasm for this project—and for the study of Greek mathematics in general—to Stewart, who soon developed his own approach to the subject. Aware that new horizons were opening in mathematics, Simson conscientiously instructed his students in the newer subjects of calculus and analytical geometry. It was at his suggestion that Stewart went to the University of Edinburgh to work under [Colin Maclaurin](#), himself a pupil of Simson's. Although he was studying calculus, higher plane curves, and cosmogony with Maclaurin, Stewart continued to correspond with Simson and, under his general direction, to carry on his work in pure geometry.

Simson's investigations were slow and laborious, and he was disinclined to publish findings that he regarded as incomplete—after the publication of a paper on porisms in 1723, nothing by him on the subject was published until eight years after his death—but he made his work freely available to Stewart. He actively encouraged Stewart to publish his celebrated series of geometrical propositions, *General Theorems*, in 1746 because the chair of mathematics at Edinburgh was vacant as a result of Maclaurin's service with the government troops in the Jacobite Rebellion of 1745 and subsequent death from an illness contracted during that campaign. Stewart was then largely unknown in Scottish academic circles: and the chair was offered to [James Stirling](#), who already enjoyed a European reputation as a mathematician of distinction. Stirling declined the invitation; and when the electors to the chair re-assessed the situation at the end of 1746, the reception accorded the publication of Stewart's book had been so favorable that they were encouraged to offer him the chair. Stewart had only recently (May 1745) been ordained minister of the parish of Roseneath, Dunbartonshire, on the nomination of the Duke of Argyll; but he had no hesitation in changing his career and was duly elected to the chair of mathematics at Edinburgh in September 1747.

Stewart's reputation as a mathematician was established overnight by the publication of the *General Theorems*. [John Playfair](#), himself a scientist of distinction, claimed that Stewart's results were “among the most beautiful, as well as most general propositions known in the whole compass of geometry, and are perhaps only equalled by the remarkable *locus* to the circle in the second book of Apollonius, or by the celebrated theorems of Mr. Cotes. . . . The unity which prevails among them is a proof that a single though extensive view guided Mr. Stewart in the discovery of them all” (“Memoir of Matthew Stewart,” 59–60). Simson's influence is obvious throughout the work. Several of Stewart's theorems are in fact porisms, although he refrains from calling them by that name, probably through fear of seeming to anticipate Simson. Several of their contemporaries assert in their memoirs that Simson, singularly lacking in personal ambition, was so keen for Stewart to succeed to Maclaurin's chair that he allowed him to incorporate in his book results that were originally Simson's; it is fairly clear that what is usually described as “Stewart's theorem” was demonstrated in lectures by Simson several years before the publication of Stewart's book.

After his election to the chair, Stewart's interests turned to astronomy and natural philosophy; and he displayed great ingenuity in devising purely geometrical proofs of results in these subjects that had previously been established by the use of algebraic and analytical methods. Examples of this kind are to be seen in his *Tracts, Physical and Mathematical* (1761). In a work published in 1763 he extended these methods to provide a basis for the approximate calculation of the distance of the earth from the sun. He derived a value of 29,875 radii of the earth for this distance—a result that was shown shortly afterward (1768) by John Dawson to be greatly in error; Stewart's mistake had been his failure to realize that his geometrical methods did not indicate how small arithmetical errors could grow in the course of his calculation.

Stewart bore the attacks on this work rather badly, and as a result his health began to fail. In 1772 he retired to his country estate at Catrine in Ayrshire, leaving the duties of his chair to his son Dugald, who was elected joint professor with him in 1775.

## BIBLIOGRAPHY

I. Original Works. Stewart's books include *General Theorems of Considerable Use in the Higher Parts of Mathematics* (Edinburgh, 1746); *Tracts, Physical and Mathematical . . .* (Edinburgh, 1761); *Distance of the Sun From the Earth . . .* (Edinburgh, 1763); and *Propositiones geometricae more veterum demonstratae ad geometriam antiquam illustrandam et promovendam idoneae* (Edinburgh, 1763).

II. Secondary Literature. See [John Playfair](#), "Memoir of Matthew Stewart," in *Transactions of the [Royal Society](#) of Edinburgh*, **1** (1788), 57–76; and Matthew Stewart, *Memoir of [Dugald Stewart](#)* (Edinburgh, 1838).

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