

Gregory, Duncan Farquharson I

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(b. Edinburgh, Scotland, 13 April 1813; d. Edinburgh, 23 February 1844)

mathematics.

Duncan Gregory came from a family with a long tradition of interest in science. His great-grandfather, his grandfather, and his father, James, were each professor of medicine at the University of Edinburgh. His great-great-grandfather was the mathematician James Gregory. Gregory attended the Edinburgh Academy, studied for a year in Geneva, and attended the University of Edinburgh. He matriculated at Trinity College, Cambridge, in 1833 and ranked as fifth wrangler in 1837. He remained at Cambridge as lecturer and tutor, and in 1840 he became a fellow of Trinity. Gregory received his M.A. in 1841. At that time he was offered a position at the University of Toronto, but as he was in poor health, he declined it. In 1838 Gregory, together with Robert Ellis, founded the *Cambridge Mathematical Journal*. Gregory was the first editor, and in this role considerably aided [George Boole](#), who submitted his earliest papers to that journal.

Gregory published two books, both designed for use at Cambridge: one on the calculus (1841) and one on applications of analysis to geometry (published posthumously in 1845). His major contribution to mathematics, however, was his theory of algebra. His earliest papers were on differential and difference equations, in which he used a method that came to be known as the calculus of operations. This method involved treating the symbols of operation

as if they were symbols of quantity. In his attempt to justify the validity of this method, Gregory examined the laws governing the combination of these symbols with constants and by iteration. As a result of these studies he came to a definition of algebra as the study of the combination of operations defined not by their specific nature but rather by the laws of combination to which they were subject. This is wholly modern in tone, and that Gregory's work is not more widely known is probably due to the fact that he did not live to create a large-scale abstract algebra to illustrate his view.

BIBLIOGRAPHY

I. Original Works. Gregory's books are *Examples of the Processes of the Differential and Integral Calculus* (Cambridge, 1841) and *A Treatise on the Application of Analysis to Solid Geometry*, [William Walton](#), ed. (Cambridge, 1845). See also *The Mathematical Writings by Duncan Farquharson Gregory*, [William Walton](#), ed. (Cambridge, 1865), which contains almost all of Gregory's published papers. *The Royal Society Catalogue* lists Gregory's works but contains several errors, which are corrected in Clock's thesis (see below).

II. Secondary Literature. Biographical material on Gregory includes a memoir by Robert Ellis, found in the *Mathematical Writings*, pp. xi-xxiv, and the article by H. R. Luard, "D. F. Gregory," in *Dictionary of National Biography*. The significance of his work is discussed in Daniel Arwin Clock, "A New British Concept of Algebra: 1825- 1850," Ph.D. disc. (Univ. of Wis., 1964); Elaine Koppelman, "Calculus of Operations: French Influence on British Mathematics in the First Half of the Nineteenth Century," Ph.D. disc. ([Johns Hopkins Univ.](#), 1969); and [Ernest Nagel](#), "'Impossible Numbers': A Chapter in the History of Logic," in *Studies in the History of Ideas*, III ([New York](#), 1935), 429-475.

Elaine Koppelman