

CHARLES TWEEDIE, M.A., B.Sc., F.R.S.E.

DIED 14TH SEPTEMBER 1925.

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THE death of CHARLES TWEEDIE has removed one of the best known names from the family circle of Scottish Mathematics. Owing to a lengthy illness which forced him some years ago to retire from his post as Lecturer in the University of Edinburgh, he was not known personally to the students of the last decade. To those, however, who are graduates of longer standing, he was a familiar figure. In the days of the old "Seven Subjects" in Arts—before the recent great developments in our University—the names of Chrystal and Tweedie were names to conjure with. There was no alternative to Mathematics then, and what Arts student of those early days does not remember the terrors of the long grim galley slip of examination paper, lengthy as the student's walking stick, then the newly acquired sceptre of academic dignity.

Mr Tweedie came of a Berwickshire family, and was born at Swinton. He was educated at George Watson's College, and entered Edinburgh University as Sibbald Bursar. At this time Professor Chrystal was engaged in writing the Second Volume of his famous Algebra, and used to give the proof sheets to his students. Tweedie's brilliant solutions of the examples first brought him into notice. He took first place in the Advanced Honours Classes, both with Chrystal and with Tait, and graduated M.A. with first class honours in 1890. He obtained the Bruce of Grangehill Bursary for the most distinguished mathematical graduate of the year. At the same time he graduated B.Sc.

In 1891 he studied German mathematics at Göttingen University, under Professors Klein and Schwartz. In 1892 he continued his mathematical studies at the University of

Berlin. Returning to Edinburgh, he became Assistant in Pure Mathematics, and shortly afterwards, when Mr Allardyce was translated to the Chair of Mathematics in California, he was appointed Lecturer. Tweedie thereafter obtained a wide experience of University work, both as Lecturer and as Examiner, and soon became Chrystal's right hand man in the Department of Mathematics.

Mr Tweedie's preference was for Analysis, but his departmental work lay chiefly in Geometry. In this he achieved a high reputation. He was a brilliant teacher, ever systematising and building up the subject so as to put it in the most impressive way before the student. When one thinks of much of the teaching of geometry some thirty years ago, with its strings of propositions, ill-arranged, and hence difficult to remember, one can appreciate how much a great teacher of those days could do in his presentation of the subject.

Mr Tweedie, besides being a good classical scholar was an accomplished linguist, and was well read in the mathematics and literature of France and Germany. During his middle years at the University he became much attracted by the Italian School of Geometry. In his usual thorough way he devoted himself to the study of Italian, and used to read widely in the historical and mathematical literature of Italy. He was greatly interested in comparing the Geometrical Schools of Britain, France, Germany and Italy, and used to correspond with some of the famous continental geometers.

He was deeply interested in the teaching of mathematics, and, in conjunction with Mr Pressland of the Edinburgh Academy, he wrote an admirable Trigonometry for Schools. For a long time he was a University Inspector of Schools under the Scottish Education Department. When the office of Official Adviser in Arts was created in the University, Mr Tweedie was one of the first two holders of the post. As will be remembered by many, he was in sole charge of Mathematics in the "Summer Session" of ancient days. For some years he was a Member of Council of the Royal

Society of Edinburgh. He was also a keen bibliophile, and specialised in the works of the early Scottish Mathematicians. Many of these volumes have been left to various libraries.

Needless to say Mr Tweedie was a Past-President of the Edinburgh Mathematical Society of which he had been one of the first and most active members. He contributed from time to time fourteen articles to the *Proceedings* and two to the *Notes*. Some of his mathematical papers are in the pages of the Royal Society of Edinburgh. He contributed many mathematical articles to the Harmsworth Encyclopaedia, and he also wrote in the *Mathematical Gazette*. He used to contribute in French to *L'Enseignement Mathématique*, and other journals, and one of his papers on "Cubics" attracted much attention. He was a Member of the Circolo Matematico di Palermo.

For a long time he had a desire to write on the great Scottish Mathematicians, and when he retired from the University he received a Carnegie Fellowship, which stimulated him, in spite of his fast failing health, to begin this work.

He published in 1915 in the *Mathematical Gazette*, "A Study of the Life and Writings of Colin Maclaurin," who was Newton's great Scottish disciple. In this article Tweedie translated, modernised, and summarised in a very brief form, the works of Maclaurin. After discussing the "Geometria Organica" he remarks that the production of this brilliant piece of geometrical research on the part of the youthful professor in Aberdeen would alone be sufficient to render Maclaurin's name immortal. Mr Tweedie quotes some of the pronouncements upon Maclaurin by famous Continental Mathematicians. Thus, Lagrange in speaking of Maclaurin's memoir on the tides calls it a "chef d'œuvre de Géométrie qu' on peut comparer à tout ce qui Archimède nous a laissé de plus beau et de plus ingénieux." After discussing the other works of Maclaurin, including the Algebra, the Account of Newton's Philosophical Discoveries, the Treatise of Fluxions, and what may be called his Higher Plane Curves, Tweedie glances at his human side in the Braikenridge-Maclaurin

controversy, and remarks on the sensitiveness of even great mathematicians in their claims to the priority of discovery. At the same time he wrote "The Geometria Organica of Colin Maclaurin: An Historical and Critical Survey." This dealt specially with Maclaurin's greatest achievement, and appeared in the *Proceedings* of the Royal Society of Edinburgh, Session 1915-16.

He then turned his attention to James Stirling, and produced in 1920 for the *Mathematical Gazette*, the "Life of James Stirling the Venetian." In continuation of this subject Tweedie achieved a great success, and produced in 1922, a noble volume, in which, after treating of the life and standard works of Stirling, particularly the "Enumeration of Cubics" and the "Methodus Differentialis," he delved deeply into his mathematical correspondence. He records letters which passed between Stirling and Maclaurin, Cramer, Bernoulli, Clairaut, Euler, and many others less known to fame; and has succeeded in getting some of Stirling's letters printed for the first time. By this time his strength was almost spent. He was too ill to begin on the Gregories, as he had hoped, so he found a briefer theme in Gray the Arithmetician, the Scottish Cocker. "Not in accordance with Cocker" used to be a well-known phrase. This concluding paper was published in 1925, and, as was fitting, in the *Proceedings* of the Edinburgh Mathematical Society. With this publication his life-work finished.

Mr Tweedie, the man, was a delightful personality. Like all Scotsmen he was a little difficult to get to know at first. He was a great country lover, and became a keen shot. He used to take, with a friend, various shootings in the South of Scotland. He was an enthusiastic golfer, and a sound billiard player. In those happy years before 1914 he travelled widely in France, Germany, Italy, and Austria. He died at the age of fifty-seven and was unmarried. Stricken down in the prime of life, for nearly fifteen years he had been disabled and in great pain. During all that time the writer never heard him utter a word of bitterness or complaint, and

throughout it he even accomplished monumental work. A more noble and heroic fight against hopeless odds no man could have achieved. He is greatly lamented by all who knew him.

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MR TWEEDIE'S CONTRIBUTIONS TO MATHEMATICAL LITERATURE.

*Proceedings of the Edinburgh Mathematical Society.*—

Fourteen Papers occurring in Vols X., XI., XIII., XVII., XIX., XX., XXII., XXIV., XXVI., XXX, XXXVI., XXXVII., XLIII.

*"Notes" of the Edinburgh Mathematical Society.*—

Two Notes in No. 4 and No. 21.

*Royal Society of Edinburgh.*—

Transactions. One paper in Vol. XL.

Proceedings. Two papers in Vols. XXIII. and XXXVI.

*The Mathematical Gazette.*—

Two papers in Vols. VIII. and X.

Two supplementary papers in Vols. IX. and X.

*Encyclopædia Article.*—

Harmsworth Encyclopædia. More than nine Mathematical articles.

*L'Enseignement Mathématique.*—

Two papers in Vols. V. and XIV.

*Rendiconti del Circolo Matematico di Palermo.*—

One paper in Vol. XXIX.

*Books.*—

Textbook: Elementary Trigonometry. By A. J. Pressland and C. Tweedie.

Biography—James Stirling, A Sketch of his Life and Works, along with his Scientific Correspondence.

E. M. H.