

PROFESSOR D. M. Y. SOMMERVILLE, M.A., D.SC., F.R.S.E.

By Professor H. W. TURNBULL.

DUNCAN MCLAREN YOUNG SOMMERVILLE, the son of the Rev. Dr James Sommerville, was born in 1879 in Rajputana, and died on 31st January 1934 in New Zealand. After receiving an early education at Perth Academy he went to the University of St Andrews where his mathematical and scientific ability soon became apparent. In 1899 he obtained a Ramsay, and in the following year a Bruce Scholarship: in 1905 he was appointed Lecturer in the Mathematics Department of St Andrews, a post which he filled until in 1915 he became Professor of Pure and Applied Mathematics in Victoria College, Wellington, New Zealand. He was a prominent supporter of our Society, holding the office of President for the Session 1911-12. In 1928 he was awarded the Hector Medal of the Institute of New Zealand. He was also much interested in astronomy and was one of the founders of the New Zealand Astronomical Society and its first secretary. At the Adelaide meeting of the Australasian Association for the Advancement of Science held in 1924 he was president of Section A.

His scholarly and unobtrusive demeanour as a young lecturer won the admiration of his colleagues and pupils in St Andrews where his teaching left a permanent mark. While he was essentially a geometer he had considerable interests in other sciences; and it is noteworthy that the classes which he chose to attend in his fourth year of study had been in Anatomy and Chemistry. Crystallography in particular appealed to him; and doubtless these possible outlets influenced his geometrical concepts and led Sommerville to ponder over space filling figures, and gave an early impetus to thoughts in a field which he made peculiarly his own. He had an original mind, and beneath his outward shyness considerable talents lay concealed: his intellectual grasp of geometry was balanced by a deftness in making models, and on the aesthetic side by an undoubted talent with the brush. In the course of years he produced a pleasing collection of water colour sketches of New Zealand scenery.

His mathematical work falls naturally into two parts: that of the teacher and that of the original investigator. His text books which have appeared at regular intervals are a valuable link between the old and the new era in the teaching of geometry at College. They are the *Elements of Non-Euclidean Geometry* (1914), *Analytical Conics* (1924), *Introduction to the Geometry of n Dimensions* (1929), and the recent *Three Dimensional Geometry* (1934) the appearance of which he did not live to see. All are characterized by a variety of algebraic treatment and a wealth of illustrations and examples, but nowhere

does technical manipulation outrun the geometry. The first of these, a provocative little book, appeared at a time when metrical systems alternative to that of Euclid were known only to the few. It is not surprising that such a teacher carried throughout his life the esteem and appreciation of his students. One of his most distinguished pupils, A. C. Aitken, writes of the critical time in his own student days when the University of Otago was temporarily without a Professor of Mathematics, and how willingly Sommerville filled the gap by weekly correspondence. The written solutions and comments went far beyond what was necessary for mere elucidation.

Beginning in 1905 Sommerville wrote over thirty original papers and notes which have been published in well known journals at home and abroad. The first, entitled *Networks of the Plane in Absolute Geometry* (*Proc. Roy. Soc. Edinburgh*, 25) is typical of the sequel. The main theme is that of combinatory geometry, exemplified by a systematic investigation of *The Division of Space by Congruent Triangles and Tetrahedra* (1923) in the same journal, and extended to n dimensions (*Palermo*, 48 (1924), 9-22). Out of this grew the work upon the relations connecting angle sum and the volume of a polytope in space of n dimensions (*Proc. Roy. Soc. London* (1927)).

In his geometrical¹ interests Sommerville exhibited an unusual independence. Although he was conversant with the more fashionable developments of the subject his own researches are for the most part concerned with the two themes of Non-Euclidean Geometry (in the restricted sense of geometry with a projective metric) and the enumerative and other properties of configurations possessing some degree of regularity or completeness, both themes being extended to n dimensions. His familiarity with Non-Euclidean Geometry must have been almost unique: he treated it as worthy of a detailed study comparable to that accorded to Euclidean Geometry. There may be mentioned as examples of his researches the classification of all types of Non-Euclidean Geometry (including those usually excluded as bizarre); the extension, involving the measurement of generalized angles in higher space, of Euler's Theorem on Polyhedra; space-filling figures; the classification of polytopes (*i.e.* the generalization, in higher space, of polyhedra): it is typical that this includes polytopes in Non-Euclidean Space. His text-book *Introduction to Geometry of n Dimensions* gives some notion of his researches in these two directions.

His wide knowledge of other branches of geometry (and incidentally of European languages) are seen most clearly in his *Bibliography of Non-Euclidean Geometry*, whose title, bereft of its subtitles, is misleading, any work on higher space being included.

¹ For cooperating in this appreciation of the geometrical work I have to thank Dr G. Timms.

Sommerville was ever ready to apply his special gifts to unusual examples, as in his analysis of preferential voting by means of a figure in higher space, and in a highly original analysis of the musical scale. His was a life of unsparing activity, and the fruits of his work will abide. There has passed from Scotland one who had already become her leading geometer of the present century.

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1. On the number of Independent Conditions involved in the Vanishing of a Rectangular Array, 24, pp. 2-6 (1905).
2. On Certain Projective Configurations in Space of n Dimensions and a Related Problem in Arrangements, 25, pp. 80-90 (1906).
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