Mathews, George Ballard | Encyclopedia.com

(*b*. London, England, 23 February 1861; *d* d. Liverpool, England, 19 March 1922)

mathematics.

Born of a Herefordshire family, Mathews was educated at Ludlow Grammar School; at University College, London; and at St. John's College, Cambridge. In 1883 he headed the list in the Cambridge mathematical tripos. In 1884 he was elected a fellow of St. John's, but in the same year hewas appointed to the chair of mathematics at the newly established University College of North Wales at Bangor. He resigned the Bangor chair in 1896 and returned to lecture at Cambridge. He gave up this appointment in 1911, when he was appointed to a special lectureship at Bangor. He was elected to the Royal Society in 1897.

Mathews was an accomplished classical scholar; and besides Latin and Greek he was proficient in Hebrew, Sanskrit, and Arabic. He also possessed great musical knowledge and skill. His versatility led a colleague at Bangor to assert that Mathews could equally well fill four or more chairs at the college.

In mathematics Mathews' main interest was in the classical theory of numbers, and most of his research papers deal with topics in this field. His book on the theory of numbers, of which only the first of two promised volumes appeared, discusses in detail the Gaussian theory of quadratic forms and its developments by Dirichlet, Eisenstein, and H.J.S. Smith; it also contains a chapter on prime numbers that is concerned largely with describing Riemann's memoir, at that time little known in England. Since the book was published in 1892, it was not possible to mention the proofs of the prime number theorem, first given by Hadamard and Vallée Poussin in 1896. In a related field, his 1907 tract on algebraic equations gave a clear exposition of the Galois theory in relation to the theory of groups.

A collaboration with Andrew Gray, then professor of physics at Bangor, produced a book on Bessel functions, the first substantial text on this subject in English. The theory is developed carefully and rigorously, but throughout the book stress is laid on applications to electricity, hydrodynamics, and diffraction; in this respect the book retained its value even after the publication in 1922 of Watson's standard treatise on the theory of these functions.

Mathews's book on projective geometry had two main aims: first, to develop the principles of projective geometry without any appeal to the concept of distance and on the basis of a simple but not minimal set of axioms; and second, to expound Staudt's theory of complex elements as defined by real involutions. Much material on the projective properties of conics and quadrics is included. The topics were relatively novel in English texts, although the first volume of Oswald Veblen and J. W. Young's *Projective Geometry* and just become available.

Mathews' research papers advanced the study of higher arithmetic, and his books were equally valuable, since they gave English readers access to fields of study not then adequately expounded for the English speaking world.

BIBLIOGRAPHY

I. Original Works. Mathews' books are *Theory of Numbers* (Cambridge, 1892); *A Treatise on Bessel Functionsand Their Applications to Physics* (London, 1895; 2nd ed., rev. by T. M. MacRobert), written with A. Gray; *Algebraic Equations*, Cambridge Mathematical Tracts, no. 6 (Cambridge, 1907; 3rd ed., rev. by W. E. H. Berwick); and *Projective Geometry* (London, 1914). The 2nd ed. of R. F. Scott's *Theory of Determinants* (London, 1904) was revised by Mathews.

Most of Mathews' research papers were published in *Proceedings of the London Mathematical Society* and *Messenger of Mathematics*.

II. Secondary Literature. See the obituary notices by W. E. H. Berwick, in *Proceedings of the London Mathematical society*, 2nd ser., **21** (1923), xlvi–l; and A. Gray, in *Mathematical Gazette*, **11** (1922), 133–136.

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