Bromwich, Thomas John I'anson | Encyclopedia.com

(*b*. Wolverhampton, England, 8 February 1875; *d*. Northhampton, England, 26 August 1929)

mathematics.

Bromwich, whose father was a woolen draper, received his early education in Wolverhampton and in Durban, South Africa, where the family immigrated. He entered Cambridge in October 1892 as a pensioner of Saint John's College and graduated three years later as senior wrangler in a class that included E. T. Whittaker and J. H. Grace. He obtained a fellowship in 1897 but left Cambridge in 1902 to become professor of mathematics at Queen's College, Galway. Bromwich returned in 1907 as permanent lecturer in mathematics at Saint John's College and received the Sc.D. in 1909. He was elected to the Royal Society in 1906 and was active in the London Mathematical Society, serving as its secretary (1911–1919) and vice-president (1919, 1920). The first two decades of Bromwich's career were distinguished by numerous publications and vigorous teaching, but mental affliction led to diminished productivity in his later years and eventually to suicide.

Described by G. H. Hardy as the "best pure mathematician among the applied mathematicians at Cambridge, and the best applied mathematician among the pure mathematicians," Bromwich was well known for his precision, mastery of technique, and skill in algebraic manipulation. But Hardy also described Bromwich as lacking the power of "thinking vaguely" and Bromwich's work as "a little wanting in imagination."

The author of two books, two pamphlets, and some eighty papers, Bromwich is best known for his encyclopedic *Introduction to the Theory of Infinite Series* (1908). Although this book has been praised for its richness of detail and its abundance of examples, it has also been criticized for defects in its general structure—for example, its frequent failure to set off and to emphasize fundamental ideas. The book, based on Bromwich's lectures at Galway, incorporates many of his own researches separately published between 1903 and 1908.

Another series of researches culminated in Bromwich's Cambridge Tract, *Quadratic Forms and Their Classification by Means of Invariant Factors* (1906). In these publications Bromwich's creative powers are most fully evident, for in them he both introduced English readers to Kronecker's ideas and methods in the theory of quadratic and bilinear forms and advanced the knowledge of these forms.

Bromwich's first publication, as well as many later papers, was in applied mathematics. Especially under the influence of George Stokes, Bromwich did significant work in the mathematics of electromagnetism and of other subjects as well (including lawn tennis). Most memorable is a series of papers that began in 1916 with "Normal Coordinates in Dynamical Systems." In this paper Bromwich indicated how Oliver Heaviside's much criticized calculus of symbolic operators could be developed in a manner acceptable to pure mathematicians by treating his operators as contour integrals.

BIBLIOGRAPHY

I. Original Works. Bromwich's two books are *Quadratic Forms and Their Classification by Means of Invariant Factors* (Cambridge, 1906); and *An Introduction to the Theory of Infinite Series* (London, 1908, 1926). For a bibliography of his papers, see below.

II. Secondary Literature. Articles on Bromwich are G. H. Hardy, "Thomas John I'Anson Bromwich," in *Journal of the London Mathematical Society*, **5** (1930), 209–220; and Harold Jeffreys, "Bromwich's Work on Operational Methods," *ibid*., 220–223. See also G. H. Hardy, *Proceedings of the Royal Society of London* (Section A), **129** (1930), i–x. All three of the above articles include bibliographies; the last includes a portrait. See also "Bromwich," in *Alumni Cantabrigienses*, Part II, Vol. I (Cambridge, 1940), 392.

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