

of this document, of which he knew by a reference in another work. At last he got possession of a copy which had probably during all this time been buried in the library of a prominent mathematical tutor at Cambridge, with whom he had been in frequent intercourse. Thomson then took it with him to Paris, where Sturm and Liouville at once recognised its merits. He then published it in 'Crelle's Journal,' where it has ever since been referred to as a fundamental essay on the so-called potential theory.¹ One of the most original thinkers on mathematics, who introduced a novel principle into algebraical science, George Boole, never attained to a higher position than that of teacher at a remote Irish provincial College.² But perhaps the most signal example of the want of support which the

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Boole.

¹ See note 1 to p. 231; also Sir William Thomson, reprint of papers on "Electrostatics and Magnetism," 2nd ed., London, 1884, p. 2, note; p. 126, note.

² George Boole (1815-64), a native of Lincolnshire, was one of the few great and original mathematicians who, like Leibniz and Grassmann, and to some extent Gauss, looked at the logical as well as the purely arithmetical side of the language of symbols. Though his treatises on 'Differential Equations' (1859) and on 'Finite Differences' (1860) have become well-known text-books, and his 'Laws of Thought' (1854), in which he examined the foundations of the mathematical theories of logic and probabilities, remains a unique work, his principal services to science lie in the direction of the "calculus of operations." In this branch of mathematics, which is peculiar to England, the symbols indicating an arithmetical op-

eration are separated from those denoting quantity and treated as distinct objects of calculation. In connection with these investigations, many of which have now penetrated into ordinary text-books, Boole was led to examine the conditions under which and the forms in which algebraical expressions, whilst undergoing changes and transformations, remain, nevertheless, unaltered (invariant) (1841). By introducing this point of view he has, so to speak, created modern algebra; founding the extensive and fruitful science of "Invariants." Of this we shall treat later on. I now only refer to the further development of this subject in the hands of Cayley and Sylvester, and to the valuable sketch of the history of this branch of mathematics by Dr F. Mayer in the first volume of the 'Jahresbericht der deutschen Mathematiker-Vereinigung,' Berlin, 1892.