

William Durham. By Professor C. G. Knott, D.Sc.

(Read January 21, 1895.)

William Durham was born at Edinburgh in November 1834. He received his education at the Edinburgh High School; but, much to his own disappointment and that of the rector, was removed at a comparatively early age and put to business. After spending some years in the publishing-house of Adam Black, senior, he was taken into his father's business of wholesale stationer and paper-maker. But Mr Durham was, by nature, a student. Science, especially chemistry, was his chief interest through life. It was this interest which sustained him in spirit amid the trials and disappointments that are almost inevitable when a man is launched on a career essentially out of harmony with his whole bent of mind. When a little over twenty years of age, William Durham set up his private laboratory at Glenesk House, Loanhead; and experimental work occupied much of his attention to the day of his death, January 23, 1893.

He was one of Professor Tait's earliest laboratory students, and his first paper communicated to this Society is a record of work done there. The title is "On the Currents produced by Contact of Wires of the same Metal at different Temperatures," read 3rd June 1872 (*Proc. Roy. Soc. Edin.*, vii. pp. 788-791). The investigation was undertaken at Professor Tait's suggestion, and the general result is that up to temperatures of 325° C. the transient current obtained by contact of hot and cold platinum wires is proportional to the difference of temperature. The novelty of the method employed deserves mention; and also the peculiar difficulty of getting exactly similar contacts between exactly similar pairs of surfaces at given temperatures. The constancy in the results obtained by Mr Durham attests his skill and patience as an experimenter.

Mr Durham was elected a Fellow of the Society in February 1874, and all his other papers have to do with solutions. The most

important of these, read January 21, 1878, is on "Suspension, Solution, and Chemical Combination" (*Proc. Roy. Soc. Edin.*, ix. pp. 537-541). His main conclusions are, that between suspension and chemical combination there is no break in the series of grades of solution; that chemical combination, solution, and suspension differ only in degree; and that the attraction of chemical affinity is not, in all cases at any rate, exhausted when a definite compound is formed, but has sufficient power left to form solution or suspension compounds. His latest paper, on the "Laws of Solution" (*Proc. Roy. Soc. Edin.*, xiv. pp. 381-387), discusses the last conclusion from the point of heats of combination. The first and second conclusions form the main theme of a very recent paper on "Solution and Pseudo-Solution" (*Trans. Lond. Chem. Soc.*, 1892), by Messrs Picton and Linder, who seem to have been unacquainted with Mr Durham's pioneer work. Other papers by Mr Durham on the same subject will be found in vols. xi., xiii., and xiv. of the Society's *Proceedings*; also in the *Chemical News* (1878), in *Brit. Assoc. Reports* (1887), and in *Nature* (vol. xxxvi.). Working at a time when the modern electrolytic theory of solution was but dimly apprehended, Mr Durham was unable to develop his views to their full significance. We should, perhaps, regard them as a first statement of an important aspect of the modern theory. In regard to Mr Durham's powers as a practical chemist, Professor Crum Brown writes:—"When I was asked to report on the means of purifying the Gala Water, I selected Mr Durham as assistant in the practical work and analysis, my choice being very much determined by the character of the papers which he had communicated to the Society. In that and in other similar work in which I had the advantage of his assistance, I found his uniform care and accuracy of great service."

Mr Durham was the writer of the long series of scientific articles which appeared with fair regularity, week by week, in the *Scotsman* newspaper from October 4, 1886, to December 3, 1892. The more important of these were republished in book form under the general title of *Science in Plain Language* (A. & C. Black, 1889-91). The first volume treats of "Evolution, Antiquity of Man, Bacteria," &c.; the second of "Astronomy—Sun, Moon, Stars," &c.; and the third of "Food, Physiology," &c. These titles sufficiently indicate

the wide range of subjects handled by him. The style is easy and clear, the exposition thoroughly scientific and up to date. Quiet and retiring in disposition, and almost diffident in manner, Mr Durham was a man whose native ability was apt to pass unrecognised by the ordinary eye. But in these articles, so admirable in their accuracy and in their freedom from all false rhetoric, we have a lasting revelation of the truth-loving, unostentatious character of him who wrote them.