

communication, "Notes of a Botanical Tour in Ladak or Western Tibet," appeared in the "Transactions of the Botanical Society of Edinburgh" (vol. x. 1869). In 1869, after twelve years of unremitting labour, mental and bodily, Dr Stewart returned to England, and the Government of India entrusted him with the preparation at Kew of a Forest Flora of Northern and Central India. To this great work Dr Stewart devoted a large part of his furlough, and he would doubtless have completed it in a satisfactory manner if his health had not given way. That this was the cause became apparent on his return to India, when, after a few months of office work, sickness obliged him to move from Lahore to the Hill Sanitarium at Dalhousie, where he died on 5th July 1873, aged forty-one.

8. Obituary Notice of John Hunter. By J. T. Bottomly, Esq., The University, Glasgow.

MR JOHN HUNTER was born in Belfast on the 23d of March 1843. He was the only son of the late Dr Hunter of Belfast, a gentleman who, though he was for many years before his death unable to move, was highly esteemed as a consulting physician. Mr Hunter, till he entered Queen's College, Belfast, received his education chiefly at home. During his undergraduate course he was distinguished in nearly every branch of science; and in 1863 he obtained the degree of B.A. in the Queen's University, with first-class honours in Chemistry and Experimental Physics. With similar distinction he took the degree of M.A. the following year. In the interval he held the Senior Scholarship in Chemistry in Belfast, a scholarship which is competed for annually by Bachelors in Arts of the Queen's University; and it was during this year that he published his first paper on the "Absorption of Gases by Charcoal." In 1865 he became assistant to Dr Andrews, the Professor of Chemistry in Queen's College, Belfast, an office which he held till 1870, when he was elected Professor of Mathematics and Natural Philosophy in King's College, Windsor, Nova Scotia. At Windsor his health suffered severely from the climate; and, feeling unable to encounter a second winter, he resigned his professorship, and returned home in the autumn of 1871.

During the winter of that year he took up his residence at Enniscrone, county Mayo, being under medical advice to give up active work for some months at least; but with a strong desire to carry on his chemical researches, he fitted up for himself a temporary laboratory there; and he was actively engaged in prosecuting them at the time of his sudden death, on the 13th of September 1872. His death was occasioned by an acute disease of the brain, of which he seems to have had a slight warning some months previously; but his last illness was not more than a few hours of intense pain.

He was married in 1869. His wife survives him; but he left no children.

Mr Hunter's researches were chiefly concerned with the absorption of gases by charcoal. He examined a large number of charcoals, and came to the conclusion that the greatest absorptive power is possessed by the dense charcoal of the shell of the cocoa-nut. With this material he proceeded to examine the absorption of a very large number of gases and vapours; and he extended his researches to the absorption of mixed vapours. He also investigated the relation between absorption and temperature in the cases of ammonia and cyanogen, and showed that, while raising the temperature at which the charcoal is exposed to, the gas decreases the absorption in both cases; the rate of decrease is much greater in the case of ammonia than in the case of cyanogen, between 0° C. and 55° C.; but at 55° C. the rate of decrease in the case of ammonia suddenly diminishes, and up to 80° C. it is not very much greater than the rate of decrease for cyanogen. At a point a little higher than 55° the volumes absorbed are the same for the two gases. Above this point more of cyanogen gas is absorbed by a given weight of charcoal than of ammonia; but below that point ammonia is enormously more absorbed than cyanogen. Mr Hunter was extending his observations to the effect of pressure on absorption. He had already published two papers on the subject. The last of these was communicated to the Chemical Society of London only a few weeks before his death; and it is in fact scarcely complete, through wanting his final corrections in type on it.

Mr Hunter accompanied the Deep Sea Dredging Expedition in H.M.S. "Porcupine" in the autumn of 1869, and published two

important papers "On the composition of Sea-water collected at different depths of the Atlantic, from a few feet below the surface up to 2090 fathoms," and "On the Composition of the Atlantic Ooze." These analyses included also analysis of the absorbed gases of the water. His papers are all published in the "Journal of the Chemical Society."

He was genial, warm-hearted, affectionate, a universal favourite with those who knew him, enthusiastically devoted to science, and withal highly cultivated in literature and the arts. His premature death, at a time when a life of usefulness seemed to have just commenced, is deeply regretted.

The following statement respecting the Fellows of the Society was submitted:—

I. Honorary Fellows—

Royal Personage,	1
British Subjects,	17
Foreign,	32
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Total Honorary Fellows,	50

II. Non-resident Member under the Old Laws, 1

III. Ordinary Fellows—

Ordinary Fellows at November 1872, 343

New Fellows—William Boyd, Esq.; Donald Crawford, Esq.; Dr John G. M'Kendrick; M. M. Pattison Muir, Esq.; Dr J. Bell Pettigrew; Andrew Pritchard, Esq.; Walter Stewart, Esq.; Robert Tennent, Esq.; Robert Walker, Esq.; Dr Morrison Watson; Robert Wilson, Esq.; Major Welsh, 12

W. Dittmar, Esq., reinstated, 1

 356

Carried forward, 356

	Brought forward,	356
<i>Deduct Deceased</i> —Rev. Dr Guthrie; Prof. John Hunter; Very Rev. Dean Ramsay; Prof. Macquorn Rankine; Arch. Smith, Esq.; Rev. Prof. Stevenson; Dr J. L. Stewart; R. W. Thomson, Esq.,		
	8	
<i>Resigned</i> —J. F. M. Lennan, Esq.; Dr Alex. Wood,		
	2	
<i>Cancelled</i> —Dr Richardson, Dr Foulerton,		
	2	
	——	12
Total number of Ordinary Fellows at Nov. 1873,		. 344

The following Communications were read:—

9. The Kinetic Theory of the Dissipation of Energy. By Sir William Thomson.

In abstract dynamics the instantaneous reversal of the motion of every moving particle of a system causes the system to move backwards, each particle of it along its old path, and at the same speed as before, when again in the same position. That is to say, in mathematical language, any solution remains a solution when t is changed into $-t$. In physical dynamics this simple and perfect reversibility fails, on account of forces depending on friction of solids; imperfect fluidity of fluids; imperfect elasticity of solids; inequalities of temperature, and consequent conduction of heat produced by stresses in solids and fluids; imperfect magnetic retentiveness; residual electric polarisation of dielectrics; generation of heat by electric currents induced by motion; diffusion of fluids, solution of solids in fluids, and other chemical changes; and absorption of radiant heat and light. Consideration of these agencies in connection with the all-pervading law of the conservation of energy proved for them by Joule, led me twenty-three years ago to the theory of the dissipation of energy, which I communicated first to the Royal Society of Edinburgh in 1852, in a paper entitled “On a Universal Tendency in Nature to the Dissipation of Mechanical Energy.”

The essence of Joule’s discovery is the subjection of physical phenomena to dynamical law. If, then, the motion of every par-