



PROFESSOR JOHN TYNDALL.

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WITH the death of John Tyndall one of the great lights of the modern scientific world passes "the Great Divide." Tyndall, who was born at Leighlin Bridge, Ireland, in 1820, after being connected with the Irish Ordnance Survey for some years, made his first entrance into scientific study at Queenswood College, Hampshire, going afterwards to Marburg University, Hesse Cassel, where he took a degree, and soon commenced writing papers which attracted wide attention. He was elected a fellow of the Royal Society in 1852, and a year later, Professor of Natural History at the Royal Institution. Natural philosophy was his life-study, and its fascinating aspects in connection with glaciers, light, heat, acoustics, magnetism, and electricity, furnished him with subjects of investigation which he never tired of pursuing.

Like most great men, Professor Tyndall was an incessant worker, and was always at his desk by five o'clock in the morning. Like his friend Huxley and others, members of the splendid hierarchy of brains, who were contemporaries of his, he was an ardent lover of truth and freedom of thought. His gift of a handsome sum, realized from a series of lectures delivered by him in this country, for the purpose of promoting the study of natural sciences in America, was an incident which revealed his unselfish character and devotion to the grand purpose of his life. He owed much of his popularity to the easy manner in which he was able to expound his theories, and is said to have combined French directness and lucidity in expression with German thoroughness of research, enabling him to write for a wide public. An instance of his popularity may be found in the fact that some of his works have been translated into Chinese.

Professor Tyndall was a bachelor until fifty-six years of age, when he married a daughter of Lord Hamilton. He has roused the enmity of dogmatic thinkers at times by his extreme views on matters of natural phenomena, always stoutly maintaining that the laws of nature were immutable and conducted upon principles which admitted of no temporary suspension. Among the honors showered upon him were the degrees of LL.D. of Cambridge, and D.C.L. of Oxford University.

Jan 1896

OBITUARY.

The death of Prof. TYNDALL, on December 4th, at his home in Haslemere, Surrey, after an overdose of chloral, put an end to a long period of failing health, involving insomnia.

John Tyndall was born August 21, 1820, in the village of Leighlin Bridge, Carlow, Ireland. His parents were poor, and could give him only a common-school education. In 1839 he took a position with the Irish Ordnance Survey. In 1844 he became a railway engineer. In 1847 he became a teacher in Queenwood College, Hants, a technical school. Here he met Dr. Frankland, and his studies were definitely turned in the direction of physical science. The next year he went to Germany, and studied at Marburg under Bunsen and others. From Marburg he went to Berlin and there continued his studies under Magnus. His first scientific paper was on screw-surfaces, and his second a study in the magnetic properties of crystals. The latter was published in 1850. He then returned to England, and settled in London, where he became acquainted with Faraday. In 1852 he was elected a Fellow of the Royal Society, and in 1853 was appointed a professor of natural philosophy in the Royal Institution of Great Britain. He afterwards succeeded Faraday as Superintendent of that Institution. He had already, as early as 1849, visited the Alps for recreation, and the habit thus acquired lasted for the rest of his lifetime, resulting, among other things, in that classic of mountaineering, "Hours of Exercise in the Alps" (1871). His first scientific expedition to the Alps was made in 1856, in company with Professor Huxley, and resulted in the joint treatise "On the Structure and Motion of Glaciers." Other fruits of his Alpine experiences were the "Glaciers of the Alps" (1860), and "A Vacation Tour" (1863). In 1859 he began his researches in radiant heat, which resulted in the works, "Heat as a Mode of Motion" (1863), "On Radiation" (1865), and "Contributions to Molecular Physics in the Domain of Radiant Heat." He published a work on "Sound" in 1865, and a similar volume on "Light" in 1870. Other publications of this period were "Faraday as a Discoverer" (1868), "On the Scientific Use of the Imagination" (1870), the first volume of "Fragments of Science" (1871), and "The Forms of Water" (1872). In this latter year he lectured in the United States, giving thirty-five addresses in all. These lectures were largely attended, and the net proceeds, amounting to \$23,000, were placed in the hands of a committee to be used for the endowment of research in American colleges. Cambridge had made him an LL.D. in 1855 and Edinburgh in 1866; in 1873 Oxford made him, despite the protest of the theologians, a D. C. L. The Belfast Address was given in 1874. In 1876 he married the eldest daughter of Lord Claud Hamilton. He has held a number of posts under the English government. Among his later works may be mentioned "On the Transmission of Sound by the Atmosphere" (1874), "Lessons in Electricity" (1876), "Fermentation" (1877), "Essays on the Floating Matter of the Air" (1881), and a second series of the popular "Fragments of Science" (1892). *Chicago Dial.*

Tyndall (John). Eminent English Scientist noted for his love for the Alps, and other mountainous regions. He lived in England, when circumstances permitted, on the highest hills possible. A great friend of America and the Americans.

JOHN TYNDALL.

PROFESSOR JOHN TYNDALL, LL. D., D. C. L., F. R. S., was born August 21st, 1820, in the village of Leighlin-bridge, near Carlow, in Ireland. His parents were in very modest circumstances, but they gave him a sound English education. At the age of nineteen he joined in the capacity of "civil assistant" a division of the Ordnance Survey which was stationed in his native town. In 1844 he was engaged by a firm in Manchester, and for about three years he was employed in engineering operations in connection with railways. In 1847 he accepted an appointment as a teacher in Queenwood College, in Hampshire, a new institution, devoted partly to a junior school and partly to the preliminary technical education of agriculturists and engineers. There he became acquainted with Dr. Frankland, who was resident chemist to the college, and there he began those original investigations which have placed him in the foremost rank among the explorers of science. In 1848 the two friends quitted England together and repaired to the University of Marburgh, in Hesse-Cassel, where they studied under Bunsen and other eminent professors. Afterwards Mr. Tyndall prosecuted his researches in the laboratory of Magnus, in Berlin. He conducted investigations on the phenomena of diamagnetism and on the polarity of the diamagnetic force, including researches on the magneto-optic properties of crystals, and the relation of magnetism and diamagnetism to molecular arrangement. He has published a volume on these subjects. He returned to England in 1851. In 1853, having been previously elected a Fellow of the Royal Society, he was chosen Professor of Natural Philosophy in the Royal Institution of Great Britain, and succeeded the celebrated Faraday as Superintendent. The publication of an essay on the cleavage of slate rocks was the proximate cause of his joining his friend Professor Huxley in a visit to the glaciers of Switzerland in 1856; and they afterwards published a joint paper on the structure and motion of glaciers. He returned to Switzerland in 1857, 1858 and 1859, twice in the latter year. He reached Chamouni on Christmas night, 1859, through deep snow, and two days afterwards succeeded in attaining the Montanvert, where he remained nearly three days, for the most part amid blinding snow,

and determined the winter motion of the Mer de Glace. Professor Tyndall is a Rumford Medalist of the Royal Society, and a member of various foreign scientific societies, he was made LL. D. of Cambridge in 1855, and LL. D. of Edinburgh in 1866. In 1872 Professor Tyndall went on a lecturing tour in the United States, in the course of which he delivered thirty-five lectures, thus realizing a sum of 23,000 dollars. Deducting expenses, the residue was carefully invested, and rose in a few years to 33,000 dollars, which was devoted to the founding of scientific scholarships in Harvard and Columbia Colleges, and in the University of Pennsylvania, "in aid of students who devote themselves to original research." He has written "The Glaciers of the Alps," (1860); "Mountaineering," (1861); "A Vacation Tour," (1862); "Heat Considered as a Mode of Motion," (1863); "On Radiation: the 'Rede' Lecture, May 16, 1865," published in 1865; a volume on "Sound," a volume on "Light," two volumes of "Collected Memoirs," (1883); "Faraday as a Discoverer," "Notes on Electricity," (1870); "Notes on Light," (1871); "Hours of Exercise in the Alps," (1871); "The Forms of Water in Clouds and Rivers, Ice and Glaciers," (1872); "Address Delivered Before the British Association Assembled at Belfast, With Additions and a Preface," (1874); "Fragments of Science: a Series of Detached Essays, Addresses, and Reviews," (fifth edition, 1876); and "Essays on the Floating Matter of the Air in Relation to Putrefaction and Infection," (1881). He married, February 29, 1876, Louisa, eldest daughter of Lord and Lady Claud Hamilton. G. W. M.

JOHN TYNDALL.

IN the death of this distinguished physicist, which took place on December 4th last, the scientific world loses one of its most brilliant expounders. Few names of persons not officially connected with the politics of a country have been more prominently before the public during the period of the last quarter of a century than that of Professor Tyndall. With all the resources of the scholar, the caution of the critical and successful experimentalist, and a force of oratory which always stood him in good stead, Professor Tyndall was generally in the fore front of any discussion or controversy which touched the modern development of science. With his intimate friend, and for many years associate in scientific work, Professor Huxley, and the late Charles Darwin, he formed the trio of savants whose names have long been identified with nearly all that was eminent in English science and with that conscientious, but at the same time broad, method of investigation and of forcing a conclusion which has exerted so remarkable an influence upon the tendencies of research in general and upon questions of sociology in special.

Professor Tyndall was a fearless combatant, and he rarely had occasion to feel the wounds inflicted by an adversary. As the successor of Michael Faraday in the chair of Natural Philosophy at the Royal Institution of Great Britain, he continued the researches of his illustrious master, and added additional luster to the institution with which the names of Humphrey Davy and David Brewster had already been associated, and where at present Lord Rayleigh, scarcely less eminent than any of his predecessors, is the presiding genius. Tyndall's researches in the domains of magnetism and of molecular physics generally have won for him world-wide recognition as a successful experimentalist; as a teacher and expounder of his researches he had no superior and but few equals.

Fond of nature's works as they were re-

vealed in his laboratory, Professor Tyndall was still more fond of the grand scenes that presented themselves without. From the earlier days of his scientific career—when, with Huxley, he first investigated the laws of glacial physics—almost to the end he was a devoted friend of the Alps, and few mountaineers in that region of rugged ice-fields could claim superiority over the British scientist, either as a daring venturer over the new and unbroken fields or as a successful transgressor of paths that had already been beaten. Tyndall was the first to make the dangerous passage of the Mont Cervin (Matterhorn) from Breuil to Zermatt, and he was likewise the first (in 1861) to scale the hitherto inaccessible peak of the Weisshorn. For many years of late he was a regular visitor to the Bel Alp, where, amidst some of the grandest scenes of nature, he conducted experiments upon the impurities of the atmosphere and further investigations in the domain of glacial dynamics. No more charming work of out-door recreation or travel has appeared in the English language than Tyndall's "Hours of Exercise in the Alps"—a work which shows the savant in the light of a master of style and of forcible description, at the same time that it reveals that boundless enthusiasm for nature which, doubtless, helped much toward the success of his career. A second work, also largely embodying his studies in the Alps, is the "Forms of Water," forming the first volume of the International Scientific Series, which, with the exception of Darwin's *Origin of Species*, has seemingly been translated into more foreign tongues than any other scientific publication in the English language.