THURSDAY, MARCH 21, 1872

THE HISTORY OF THE ROYAL INSTITUTION*

NO other Institution has been so closely associated with the greatest discoveries of Chemical and Physical Science during the present century as that which has its abode in the well-known building in Albemarle Street. The names of Rumford, Banks, Young, Davy, Faraday, Tyndall, will always add lustre to its annals; nor will it be forgotten that in its laboratory were made the most famous discoveries of Davy and Faraday. Dr. Bence Jones gives us in this very interesting volume a sketch of the history of the Institution, derived from its own record of proceedings, interspersed with biographical notices of its founder, Count Rumford, and its most eminent professors, Garnett, Young, and Davy. Of Faraday we hear comparatively little, Dr. Bence Jones having sketched his life in a separate biography; and with regard to the eminent men whose present connection with the Institution is adding fresh popularity to its courses of lectures, he is altogether silent.

Probably few of the visitors who now attend the lectures at the Royal Institution, or who crowd to its fashionable Friday evening *réunions*, are aware of the object with which it was originally founded, as shown in the prospectus drawn up by Count Rumford in 1799, from which the following are extracts:—

"Proposals for forming by subscription, in the metropolis of the British Empire, a public Institution for diffusing the knowledge and facilitating the general introduction of useful mechanical inventions and improvements, and for teaching by courses of philosophical lectures and experiments the application of science to the common purposes of life:—

"The two great objects of the Institution being the speedy and general diffusion of the knowledge of all new and useful improvements, in whatever quarter of the world they may originate, and teaching the application of scientific discoveries to the improvement of arts and manufactures in this country, and to the increase of domestic comfort and convenience, these objects will be constantly had in view, not only in the arrangement and execution of the plan, but also in the future management of the Institution.

"As much care will be taken to confine the establishment within its proper limits as to place it on a solid foundation, and to render it an ornament to the capital and an honour to the British nation.

"In order to carry into effect the second object of the Institution, namely, 'Teaching the application of science to the useful purposes of life,' a lecture-room will be fitted up for philosophical lectures and experiments, and a complete laboratory and philosophical apparatus, with the necessary instruments, will be provided for making chemical and other philosophical experiments."

This basis was adhered to, and these eminently practical objects were steadily kept in view, as long as the management remained with the original founders of the Institution; but it soon passed into the second stage of its existence. Count Rumford had fixed his residence abroad during the latter years of his life, the eminent men whom he had collected around him, headed by his intimate friend and ally, Sir Joseph Banks, withdrew from its active management, and its control passed into the hands of others, whose chief aim was to recruit its exhausted funds by making the Royal Institution one of the most fashionable places of resort in London. In this they succeeded; but their success was mainly due to the extraordinary interest which centred round the remarkable discoveries of young Davy which signalised the early years of the century. When we read the history of these discoveries, following one another in quick succession—the determination of the true constitution of the alkalies and alkaline earths, potassa, soda, lime, magnesia, the decomposition of ammonia—each a link in the chain of investigation which produced a complete revolution in chemical philosophy, we are disposed to query whether future diligent workers in the fields of science will ever again be rewarded by discoveries of similar gigantic importance.

The sketch of the life of Sir Benjamin Thompson, Count Rumford of the Holy Roman Empire, as presented by Dr. Bence Jones, shows a character full of strange contradictions. A native of North America, during the War of Independence an ardent Royalist, and throughout his life imbued with aristocratic principles of the strongest tinge, he yet spent all his energies in physical discoveries and mechanical inventions calculated to ameliorate the condition of the masses, and to promote the health and comfort of their lives. It was indeed for the purpose of forwarding this object mainly, as we have seen, that he projected the establishment of the Royal Institution. A man of the warmest affections, he yet compelled his second wife (Lavoisier's widow), to seek relief from domestic unhappiness in a judicial separation. With a remarkable power of attracting around him, and moulding to his views, the most eminent men in various branches of science, there were yet few whom he did not estrange from him by his morbid jealousy, and by the eccentricity of his conduct. The littlenesses of his character will, however, be forgotten in the noble aims and great results of his life.

We are glad to have recalled to us in this volume the career of so disinterested a student of Science as Dr. Thomas Young, and to find a full recognition of his eminent position as the *avant-courier* of Davy and Faraday. Born in Somersetshire in 1773, he showed in his school-boy days that precocity of intellect and power of acquiring knowledge in almost any subject presented to him, which does not always mark the future genius. After spending the years from fourteen to nineteen as a private tutor, he became in 1793 a student at St. Bartholomew's Hospital, presented during the same year a paper to the Royal Society on the "Structure of the Crystalline Lens," and in 1794, at the age of twenty-one, was elected a Fellow of that body. From 1799 to 1801 Dr. Young was carrying on his remarkable series of experiments on Sound and Light, and in the latter year was appointed Professor of Natural Philosophy to the Royal Institution. His lectures however were not considered sufficiently popular for the audiences that then frequented it, and his connection with it terminated in 1803. During the next twenty years of his life he practised as a physician in London, being connected with St. George's Hospital. In 1818 he was appointed

* "The Royal Institution: Its Founders and its First Professors." By Dr. Bence Jones, Honorary Secretary. (London: Longmans and Co. 1871.)

superintendent of the "Nautical Almanack" and secretary of the Board of Longitude, and in 1827, on the resignation of Sir Humphry Davy, was spoken of as a probable successor to his office of President of the Royal Society, Davies Gilbert, however, being chosen. He died in 1829, at the age of 56, and his character was thus drawn by his intimate friend Sir Humphry Davy :—"A man of universal erudition and almost universal accomplishments. Had he limited himself to any one department of knowledge, he must have been first in that department. But as a mathematician, a scholar, and a hieroglyphist, he was eminent ; and he knew so much that it was difficult to say what he did not know."

Sir Humphry Davy's brilliant career, and especially that portion of it which contributed so greatly to the fame and success of the Institution with which he was connected, is drawn in detail by his biographer ; and the failings in his character and in his life which obscured its lustre to his contemporaries are in no way concealed. The following contrast of the characters of Davy and of his pupil and successor, Faraday, will be read with interest : —"Whenever a true comparison between these two nobles of the Institution can be made, it will probably be seen that the genius of Davy has been hid by the perfection of Faraday. Incomparably superior as Faraday was in unselfishness, exactness, and perseverance, and in many other respects also, yet certainly in originality and in eloquence he was inferior to Davy, and in love of research he was by no means his superior." As early as 1804, when Davy was only twenty-six, Dr. Dalton consulted him as to the best mode of preparing his lectures, and described him as "a very agreeable and intelligent young man, the principal failing in whose character as a philosopher is that he does not smoke ;" and within two or three years from that time he had made the discoveries which have immortalised his name.

Dr. Bence Jones does not carry down the history of the Royal Institution beyond 1814, when it became as closely associated with Faraday's career as it had previously been with Davy's. We have seen what were the primary objects for the promotion of which the Institution was founded ; and we know also the great work which it effected during the first ten years of its existence. These special purposes soon gave way to the effort, as our author expresses it, after striving to be fashionable ; and the fashionable element has continued to be the most prominent feature in its subsequent life to the present day. Something is, no doubt, gained by making scientific subjects one of the ordinary topics of conversation in West End *salons ;* the continuation of the History of the Royal Institution, which will have to be written twenty years hence, will show whether this object is compatible with the carrying on of original investigations which will add to the sum of our knowledge of the laws of Nature.

OUR BOOK SHELF

Une Expérience relative à la Question de la Vapeur Vésiculaire. Par M. J. Plateau. (Brussels : F. Hayez.)

THE elder Saussure, and after him De Luc, considered it to be an established fact that clouds are formed of little hollow globules, which Saussure designated vesicular vapours, or vesicles. These vesicles, having a structure similar to the soap bubble, were assumed to be capable of floating in the atmosphere and of remaining suspended in it so long as their physical condition was unaltered. When they became resolved into drops of water they formed rain. The same structure was assigned to the cloud formed by the condensation of the vapour of boiling water in air colder than itself. M. Plateau has endeavoured to put this view of the vesicular constitution of vapour to the test of experiment. With this view he has taken advantage of a method devised by M. Duprez, for inverting a wide tube (20mm. in diameter) full of water, so that the water may remain suspended in the tube. By means of a narrow tube drawn out at one end, so as to present an orifice of 0·4mm. in diameter, he succeeded in obtaining small hollow globules of water of less than a millimetre in diameter, and transporting them under the free surface of the water, suspended in the wide tube. As soon as contact was established with that surface, the little bubble became detached, and the air which it contained penetrating into the liquid, mounted through it. The experiment, on being several times repeated, gave always the same result. M. Plateau has applied this method to the cloud formed when water is boiled in free air. "Let us imagine," he says, "that at a certain distance from the surface of the water suspended in the wide tube, a current of visible vapour of water arises. If this vapour is composed of vesicles, each of them which comes into contact with the liquid surface must introduce into the water a microscopic bubble of air, which will immediately begin to ascend, so that the whole will form in the water of the tube a cloud which will rise slowly in it, and alter its transparency." In making the experiment, no cloud was produced, and M. Plateau concludes, in conformity with the view now generally held by physicists, that the vesicular state of vapour has no real existence. He discusses objections which may be raised to his experiment, such as the possible solution of the bubbles of air in the water, the bursting of the bubbles at the surface of the water and the escape of the air contained in them, or their rolling under the surface of the water till they reach the margin of the tube and thus get away ; and shows satisfactorily that these objections do not invalidate the result at which he has arrived.

Chemical Notes for the Lecture Room, on Heat, Laws of Chemical Combination, and Chemistry of non-Metallic Elements. By Thomas Wood, Ph.D., F.C.S. Pp. 181. (London : Longmans, Green, and Co.)

ON reading this volume the author's intention is plainly manifest ; the book has been written principally for the use of students preparing for the matriculation examination at the University of London. It has been written as concisely as possible, rendering the task of "cramming" the subject more easy of attainment. For such a purpose we certainly can recommend this book ; but for beginners who wish to study chemistry we think it has several faults. One of them is that such a comparatively large amount of the book is devoted to the subsidiary subject, Heat, almost a quarter of the text being thus occupied. The article on thermometers, for instance, occupies no less than nine pages, which strikes us as being rather out of proportion to the remainder of the book. A second fault is the almost complete absence of any such details as would enable a student to repeat the experiments mentioned in the text. This we think is a fault which would tend to make the beginner get up his subject parrot-like, a method which is certainly not to be desired. The chemistry of the non-metallic elements only occupies eighty-five pages of this volume ; the definitions and laws of chemical combination occupy another thirty-eight pages. The explanations, in the majority of instances, are clearly expressed, the facts of the case being stated in as few words as possible. A few of the definitions can scarcely be considered good ; one, in particular, is "that