

Obituary Notices of deceased Fellows.

REAR-ADMIRAL SIR FRANCIS BEAUFORT, K.C.B.—Among the losses which have been occasioned by death in the lapsed year, we have to deplore that of Rear-Admiral Sir Francis Beaufort, K.C.B., the late Hydrographer to the Admiralty, so well and so justly known as a scientific, indefatigable, and amiable Fellow of this and other Societies. This event occurred on the 17th of last December, at Brighton, whither he had repaired for the benefit of change in failing health, but with his mental faculties clear and vigorous. This, indeed, was exemplified in his discussing historical points on the very evening of his death; and in his consulting the ‘*Sacra Privata*’ of Bishop Wilson, a favourite work, almost until he calmly expired at 1^h 50^m after midnight: he was then in his 84th year.

This valuable officer was a son of the Rev. Daniel Augustus Beaufort, Rector of Navan, and Vicar of Collon in Ireland, who attained a well-merited esteem by his elaborate map of that country, excelled only by the subsequent Ordnance Survey. As young Francis evinced a predilection for maritime life, he had the good fortune to open his nautical career with a very able seaman, Captain Lestock Wilson, of the East India Company’s Service, under whom he acquired a proficiency in navigation. At length, in 1789, when proceeding to China, that officer received orders to examine the Macelesfield Strait for a shoal on which an Indiaman had recently been lost. Operations were commenced by a survey of Pulo Leat, an isle in the Strait of Gaspar, the chart of which was entirely drawn by Beaufort. After an unsuccessful search for the hidden danger, from eleven different stations, and just as the attempt was about to be given up, the ‘*Vansittart*’ struck upon what proved to be the very reef for which they had been seeking. The destruction of the ship advanced so quickly that all hands had to take to the boats; and they underwent great hardships before reaching the Bay of Sango Boolo, where relief was obtained.

On returning to England, great excitement pervaded the public mind, and armaments were under equipment in all our ports. Forgetting the hardships of his recent disaster, Mr. Beaufort embarked

on board the 'Aquila' frigate, and shortly afterwards sailed to the Mediterranean, escorting H.R.H. Prince Augustus, since Duke of Sussex and President of this Society. In 1794, the 'Aquila' was one of Lord Howe's 'repeaters' in the great battle fought on the 1st of June; an event which deeply impressed itself on the young officer's mind, insomuch that he ever retained a vivid recollection of its details. His next ship was the 'Phaëton,' of 38 guns, in which he saw much varied and arduous service, by which he earned his Lieutenant's commission. Continuing in the same frigate till October 1800, he won his further promotion to the rank of Commander by gallantly cutting out a 14-gun Spanish polacca from under the guns of Frangerola, a fortress near Malaga.

This promotion was somewhat dearly purchased, for Mr. Beaufort was severely wounded on the head, and had several slugs through his left arm and body, which compelled him to lie by for a time. But he had scarcely recovered, when we find him aiding his brother-in-law, Richard Lovell Edgeworth, in establishing a line of telegraph stations across Ireland; an object in which he laboured successfully and gratuitously during two years. A mind disciplined to accurate observation acquires additional power of perception and discrimination; and to this power may be assigned the admirable communication which he made to Dr. Wollaston, of certain physiological and successive effects which he experienced under suspended animation, from being all but drowned.

In the summer of 1805 Commander Beaufort was again called into active service, being appointed to the 'Woolwich,' 44; in which ship he carried out naval stores to Bombay, and returned with a convoy of sixteen Indiamen and some country-ships. In 1807 he had an opportunity, though but a hasty one, of exercising his valuable talent for marine surveying by an examination of the vicinity of Monte Video, in the Rio de la Plata. His next appointment was to the 'Blossom' sloop-of-war, in which he was principally employed in taking charge of convoys of merchantmen until he obtained post-rank in May 1810, with the command of the 'Frederickstein' frigate. In 1811 he was directed to make an examination of the southern shores of Asia Minor, a service truly congenial to his mind, since it developed his full capacity as a marine surveyor, a classical scholar, and an inquiring geologist. He had

successfully examined the coast of Karamania, and was about to continue his operations down the shores of Syria, when they were suddenly cut short by an attack of fanatical natives, by one of whom Captain Beaufort was severely, almost fatally, wounded. Thus prevented from continuing the interesting survey, he repaired to Malta, and there, with exemplary fortitude, endured intense suffering from his wound, which for several months endangered his very existence. He was then ordered to England, in company with the 'Rodney,' 74, and his ship was paid off in October 1812, after which year he went no more afloat.

But the leisure of his half-pay time was not expended in idleness, as evinced by the subsequent publication of his admirable survey with its illustrative memoir; and by his exertions in the Councils of the Royal, the Astronomical, and the Geographical Societies. He was, moreover, a member of the Board of Greenwich Visitors, and one of the Committee of the Society for the Diffusion of Useful Knowledge, wherein he originated and conducted the widely-circulated series of cheap maps. Yet twenty years were permitted to pass before he was selected to that post for which he was so obviously and so eminently qualified; for it was not till 1832 that he was installed Hydrographer to the Admiralty. This office had been turned to but small account until Captain Beaufort took it in hand, and manifested its value to the public, not only in the construction of superior charts, but also in affording aid to the Commissions on Tidal Harbours, Ports of Refuge, and Pilotage; and indeed to all branches of naval scientific knowledge.

In carrying out these duties, he was ever ready to advise and assist; and he was a warm supporter of friendless merit, even in cases where he was opposed by certain official obstructions. Through all he conscientiously did his duty, although at times he felt it painful to enjoin services without a prospect of reward, where it was deserved and expected.

Sir Francis Beaufort was appointed one of the Civil Knights Commanders of the Bath; and in 1845 he accepted the rank of retired Rear-Admiral, with permission to retain his office of Hydrographer, the daily duties of which he assiduously attended until he was turned of fourscore. He married the daughter of his first commander, Captain Lestock Wilson, shortly after his last return

from the Mediterranean ; and by that amiable lady had a family, of whom three sons and three daughters are living. Some years after her lamented death, he married, secondly, the daughter, by a third marriage, of his brother-in-law, R. L. Edgeworth, Esq., who survived him, but has since died.

ROBERT BROWN, D.C.L.—In offering to the Society a brief sketch of the career of the greatest Botanist of the age, our attention is chiefly arrested by his intense devotion to his favourite study, and by the calm, reflecting, and philosophical spirit which he brought to bear upon its pursuit, the combination of which qualities were alone sufficient to raise him, by his own unassisted efforts, to the highest position in the world of Science. Robert Brown was the second and only surviving son of the Rev. James Brown, A.M., Episcopalian Minister of Montrose, by Helen, daughter of the Rev. Robert Taylor, and was born in that town on the 21st of December, 1773. Several generations of his maternal ancestors were, like his father, ministers of the Scottish Episcopalian Church, and from them he appears to have inherited a strong attachment to logical and metaphysical studies, the effects of which are so strikingly manifested in the philosophical character of his botanical investigations. At an early age he was sent to the Grammar-school of his native town, where among his contemporaries was a boy of kindred talents, the late Mr. James Mill, with whom he maintained through life an uninterrupted intimacy. In 1787 he was entered at Marischal College, Aberdeen, where he immediately obtained a Ramsay bursary in Philosophy ; and about two years afterwards, on his father quitting Montrose to reside in Edinburgh, he was removed to the University of that city, in which he continued his studies for several years, but without taking a degree, although destined for the medical profession. At this early period the strong inclination of his mind to the study of Botany gained for him the favourable notice of the amiable Professor of Natural History, Dr. Walker, and he was induced, in the year 1791 (being then in the eighteenth year of his age), to lay before the Natural History Society, of which he was a member, his earliest Paper, containing an enumeration of such plants as had been discovered in North Britain subsequent to the publication of Lightfoot's 'Flora

Scotica,' with critical notes and observations. Although this Paper, like most of those read before the Society, was not intended for publication, it led to the communication of his specimens and observations to Dr. Withering, who was then engaged in the preparation of the second edition of his 'Arrangement of British Plants,' and laid the foundation of a warm and intimate friendship between them. In 1795, soon after the embodiment of the Fifeshire Regiment of Fencible Infantry, he obtained in it the double commission of Ensign and Assistant-surgeon, and proceeded with it to the North of Ireland, in various parts of which he was stationed until the summer of 1798, when he was detached to England on recruiting service. Fortunately for himself and for science, this service enabled him to pass several months, during this and the succeeding year, in London, where he availed himself to the utmost of the library and collections of Sir Joseph Banks, from whom his already established botanical reputation obtained for him a cordial reception. In 1799 he returned to his regimental duties in Ireland, from which he was finally recalled, in December of the following year, by a letter from Sir Joseph Banks, proposing for his acceptance the post of Naturalist in the Expedition for surveying the coasts of New Holland, then fitting out under the command of Captain Flinders. Within two days of the receipt of this letter, which placed within his reach the so-much coveted opportunity of devoting himself entirely to his favourite pursuit, he quitted the regiment and the military service; and in the summer of 1801 he embarked at Portsmouth, full of ardour and confident of success. His absence from England lasted more than four years, during which the southern, eastern, and northern coasts of New Holland, and the southern part of Van Diemen's Land, were thoroughly explored. In the month of October 1805 he arrived in Liverpool with a collection of dried plants amounting to nearly 4000 species, a large proportion of which were not only new to science, but exhibited new and extraordinary combinations of character and habit. Immediately on his arrival in England, he was appointed Librarian of the Linnean Society, of which he had been elected an Associate in 1798. During his voyage he had been indefatigable in describing with the minutest accuracy the whole of the materials which he had collected, and in the accumulation of a vast store of facts and observations in relation to their

structure and affinities, as well as to all the most important points in the anatomy and physiology of plants in general. The new views which were thus opened to him on a multitude of botanical subjects, he was enabled, by his position at the Linnean Society, and by the free and unrestricted access which was liberally accorded to him to the treasures of the Banksian Library and Herbarium, to enlarge and to perfect, and to lay them before the world in a series of masterly publications, which at once stamped upon him the character of the greatest and most philosophical botanist that England had ever produced. In 1810 appeared the first volume of his '*Prodromus Floræ Novæ Hollandiæ et Insulæ Van Diemen*,' which was received by all the more profound botanists of this country and of the continent as the work of a mind thoroughly imbued with the principles of the Natural System, and giving to that system, which had hitherto found little favour out of France, a wider and a firmer basis. This important work, together with his *Memoirs on Proteaceæ* and *Asclepiadeæ*, which immediately followed, and his '*General Remarks, Geographical and Systematical, on the Botany of Terra Australis*,' appended to the '*Narrative of Captain Flinders's Voyage*,' published in 1814, by displaying in the most instructive form the superior advantages of the Natural System, whether in the monographic description of separate families, or in the comparison of the families with each other and with the entire mass of vegetation, gave new life to that system, and speedily led to its universal adoption. A series of *Memoirs* followed, chiefly in the *Transactions of the Linnean Society*, or in the appendices to various books of travel and survey, which gave fuller and more complete development to his views on almost every department of botanical science, and induced the illustrious Humboldt not only to confer upon him the title of "*Botanicorum facile Princeps*," but also to salute him with the more comprehensive and expressive designation conveyed in the dedication of the '*Synopsis Plantarum Orbis Novi*,' "*Roberto Brownio, Britanniarum Gloriæ atque Ornamento, totam Botanices Scientiam ingenio mirifico complectenti*." At the close of the year 1810, on the death of his old and intimate friend, the laborious, accurate and learned Dryander, he succeeded to the office of Librarian to Sir Joseph Banks, who (on his death in 1820) bequeathed to him for life the use and enjoyment of his library and

collections. These were subsequently, in 1827, with Mr. Brown's assent, and in conformity with the provisions of Sir Joseph's will, transferred to the British Museum; and from this latter date to his death, a period of upwards of thirty years, he continued to fill the office of Keeper of the Botanical Collections in the National Establishment. Soon after the death of Sir Joseph Banks he had resigned the Librarianship of the Linnean Society, of which he then became a Fellow, and having been for many years one of its Vice-Presidents, was at last prevailed upon, in 1849, to allow himself to be elected President. This office he retained till 1853. He became a Fellow of the Royal Society in 1811, and was several times elected into the Council. In 1839 he received its highest honour in the Copley Medal, presented to him "for his discoveries during a series of years on the subject of vegetable impregnation." In the meantime honours and titles had flowed in upon him from all quarters; and nearly every scientific Society both at home and abroad felt itself honoured by enrolling his name in the list of its Members. In 1832, the University of Oxford conferred upon him, in conjunction with Dalton, Faraday, and Brewster, the honorary degree of D.C.L. In the succeeding year he was elected one of the eight Foreign Associates of the Academy of Sciences of the Institute of France, his name being selected from a list including those of nine other *savans* of world-wide reputation, nearly every one of whom has since been elected to the same distinguished honour. During the administration of Sir Robert Peel, he received, in recognition of his great eminence in botanical science, a pension on the Civil List of £200 per annum. The King of Prussia subsequently decorated him with the cross of the highest Prussian Civil Order, "Pour le Mérite."

Among the more important of his Memoirs above referred to, may be mentioned his Papers on *Compositæ*, on *Rafflesia*, and on the Fecundation of *Orchideæ* and *Asclepiadeæ*, in the Linnean Transactions; the botanical appendices to the Voyages or Travels of Tuckey, Parry, Franklin, Abel, King, and Denham; his Papers on Active Molecules, and on the plurality of Embryos in *Coniferae*; and his contributions to Wallich's 'Plantæ Asiaticæ,' and to Horsfield's 'Plantæ Javanicæ.' Of his later publications, the most remarkable are his "Botanical Appendix to Captain Sturt's Expedition into Central Australia," published in 1849; and his Memoir

“On Triplosporite, an undescribed Fossil Fruit,” published in the Linnean Transactions in 1851. The pervading and distinguishing character of all these writings is to be found in the combination of the minutest accuracy of detail with the most comprehensive generalization. No theory is propounded which does not rest for its foundation on the most circumspect investigation of all attainable facts. In perusing them, we are first struck with the evident completeness of the investigation, and next with the wonderful sagacity with which the ascertained facts are brought to bear upon the question at issue. And these distinguishing qualities are equally obvious throughout the wide range of objects treated of, whether in the anatomy, the physiology, the classification, the description, the distribution or the affinities of plants, and in the examination both of recent and fossil structures. Among the most important anatomical and physiological subjects of which they treat, particular mention is due to the discovery of the nucleus of the vegetable cell, and of the circumscribed circulation on the walls of particular cells; the development of the stamina, together with the mode of fecundation in *Asclepiadeæ* and *Orchideæ*; the development of the pollen and of the ovulum in Phænogamous plants, with the peculiarities of the latter in *Conifera* and *Cycadeæ*, and the bearing of these facts upon the general subject of impregnation; the origin and development of the spores of Mosses; and the discovery of the peculiar motions which take place in the “active molecules” of matter when seen suspended in a fluid under the microscope. Of structural investigations, the most important are those which establish the relation of a flower to the axis from which it is derived, and of the parts of a flower to each other, as regards both position and number; the analogy between stamina and pistilla; the neurulation of the corolla of *Compositæ*, their æstivation and inflorescence; and the structure of the stems of *Cycadeæ*, both recent and fossil. To the study of fossil botany Mr. Brown was always strongly attached, and with a view to its prosecution he formed an extensive and valuable collection of fossil woods, which he has bequeathed under certain conditions to the British Museum. His collections in other departments were also considerable, and his library very extensive.

In private life Mr. Brown's character was thoroughly estimable. Shrinking, with instinctive modesty, from all public employments, whether professional or otherwise, which appeared to involve any-

thing like display, he was sometimes thought, by those who knew him little, to be cold, distant, and reserved ; while those who were admitted to the privilege of his intimacy bear unanimous testimony to his unvarying kindness of heart, the genial warmth of his feelings, and the pure benevolence of his disposition. To a mind stored with anecdote he united a strong sense of humour, and a happy facility in its expression, which rendered him a most delightful companion. And when to these qualities we add his perfect simple-mindedness, his unswerving devotion to truth, and that singular uprightness of judgment, which rendered him on all difficult occasions a most invaluable counsellor, we shall easily perceive how it was that he became so warmly endeared to the hearts of his friends. From the death of Sir Joseph Banks, who bequeathed to him his house in Soho Square, he continued to occupy that portion of it which opened upon Dean Street ; and it was in the library of that illustrious man, the scene of his labours for sixty years, surrounded by his books and by his collections, that he breathed his last, on the 10th of June in the present year, and in the eighty-fifth year of his age.

SIR JAMES MACGRIGOR was born at Cromdale, in Strathspey, Inverness-shire, on the 9th of April, 1771. He received his literary education at Marischal College, Aberdeen, where he took his degree as M.A. He studied medicine at the University of Edinburgh, and afterwards, with a view to improve his knowledge of anatomy, attended the lectures and demonstrations of Mr. Wilson in London. He then obtained the Degree of M.D. from the Marischal College. In 1793 he entered the Army by the purchase of the Surgeoncy of the 88th Regiment, with which Corps he served in Holland and Flanders throughout the Duke of York's campaign. In 1796 he proceeded to the West Indies, where, with two companies of the regiment, he was engaged in the expedition against Grenada, and in August of the same year returned to England to rejoin head-quarters. In 1799 he accompanied the 88th to Ceylon, and subsequently to Bombay. The regiment formed part of the Anglo-Indian Army sent to Egypt under the command of Sir D. Baird, and arrived at Cosseir in June 1801. Dr. MacGrigor was Superintending Surgeon of the Force, and earned well-merited commendation by his zeal and intelligence, and his judicious arrangements for the sick and wounded. In 1803 he re-

turned home with the regiment, and was shortly afterwards appointed to the Oxford Blues, with which he did duty at Windsor for some time. In 1805 he was promoted to the rank of Deputy Inspector of Hospitals, and was employed in the south-western district. At Portsmouth he superintended the landing and treatment of the wounded sent home from Sir John Moore's Army. In August 1809 he was promoted to be Inspector-General of Hospitals, and in September was sent to Walcheren as Principal Medical Officer of the expedition, to replace Sir J. Webb, and was highly commended by Sir Eyre Coote for the manner in which he discharged his duty amidst great difficulties. In the end of the year, when that unfortunate expedition had terminated, he returned to Portsmouth, where he remained nearly two years. In 1811 he was sent out to Spain as Principal Medical Officer of the Army under Lord Wellington, and arrived in time to be present at the siege of Ciudad Rodrigo. He remained with the Army till the termination of the Peninsular War, and was present in every siege and engagement from Ciudad Rodrigo to Toulouse. The Duke of Wellington, who was at no time very lavish of his compliments to medical officers, thus notices Dr. MacGrigor's services in an Order dated 26th July, 1814 :—"I have every reason to be satisfied with the manner in which Mr. MacGrigor conducted the department under his direction, and I consider him one of the most able, industrious, and successful public servants I have ever met with."

On the termination of the war he was knighted, and received the Royal permission to wear the decoration of Knight Companion of the Portuguese Order of the Tower and Sword. In 1815 he was appointed Director-General of the Medical Department of the Army, which post he filled till 1851, when he retired from active employment. In 1831 he was created a Baronet, and in 1851 was appointed to be a Knight Commander of the Order of the Bath. He died on the 2nd of April, 1858, within a few days of entering his 88th year.

Sir James MacGrigor was the author of a "Memoir of the state of health of the 88th and other Regiments at Ceylon and Bombay, from 1st June 1800 to 31st May 1801;" of a "Medical sketch of the Expedition to Egypt from India;" and of a "Sketch of the Medical History of the British Army in the Peninsula of Spain and Portugal during the late Campaign."

Shortly after his appointment to be Director-General, he organized a system of Returns from the different stations occupied by British troops, from which, after a lapse of twenty years, the Statistical Reports on the health of the Army were compiled. He also commenced, at the Invalid hospital at Chatham, a Museum of Natural History and Pathological Anatomy, which, by the contributions of the medical officers from all quarters of the world, has become one of great extent and value. But while Sir James was thus endeavouring to promote the interests of science through the instrumentality of the Department of which he was the head, he was not unmindful of the interests of the officers composing it. In 1816 he established a Society for providing pensions for the widows of medical officers in addition to those granted by Government, and one for affording assistance to the orphans of medical officers; both of which institutions have succeeded to an extent which could not fail to be gratifying to their founder.

Sir J. MacGrigor was for two successive years elected Lord Rector of Marischal College, Aberdeen. The University of Edinburgh conferred on him the honorary degree of LL.D. On the establishment of the University of London, he was nominated a member of the Senate. He was a Fellow of the Royal Society of Edinburgh, and member of various Medical Bodies. He was elected into this Society on the 14th of March, 1816.

Sir James MacGrigor was courteous and affable in his demeanour, and at all times accessible to the officers of his department, by whom he was much esteemed and respected. He retired into private life after having faithfully and efficiently served his country for the long period of fifty-eight years, during thirty-six of which he had been at the head of the Army Medical Service.

HUGH LEE PATTINSON, Esq., was born at Alston in Cumberland, where his family, belonging to the class of smaller landholders of the neighbourhood, had long resided. He received his early education at the school of his native town; what further acquirements he made he owed to self-instruction. Having when a youth been present at a lecture on chemistry, his ready mind, deeply impressed with what he heard and saw, was inflamed with a love of the science, and he thenceforward gave himself earnestly to its pursuit, with the help of such books and rude apparatus as his scanty means afforded.

While still very young, Mr. Pattinson left Alston for Newcastle-on-Tyne, to occupy a situation in a soap-work, and his position there, though a subordinate one, afforded him facilities for pursuing his favourite study. A few years after this he was appointed Assay-Master to the Commissioners of Greenwich Hospital, the chief duty of his office being to inspect, as to quality and quantity, the ores which are levied as royalties from the extensive lead mines in his native district belonging to that establishment. It was while thus employed, and when his mind was directed to the improvement of metallurgic operations, that he was led to discover his admirable and now well-known process for extracting the silver from argentiferous lead. Returning to Newcastle after a few years, to undertake the management of Mr. Beaumont's lead-smelting and refining-works in that neighbourhood, he was enabled to put in practice his method of de-silvering lead, for which he took out a patent. The profits thence accruing afforded him the means to establish, in partnership with two of his friends, a chemical manufactory at Felling, which, through subsequent additions, has become one of the most extensive in the district; and at a later period he discovered and brought into practical use a method of separating magnesia from the limestone rock containing that earth, and a process for producing oxychloride of lead, a valuable pigment, directly from the ore.

But while thus engaged in improving industrial chemistry, Mr. Pattinson was not unconcerned in matters of more purely scientific interest; and it is more especially deserving of mention, that, contemporaneously with Mr. Armstrong, he was one of the first to give an account of the remarkable fact of the evolution of electricity by effluent steam. He was also attached to the study of astronomy; and although he took little part in its pursuit as a practical observer, he possessed an elegant observatory, furnished with a transit-instrument, and also an admirable equatoreal, which, as is known to many of the Society, he liberally lent to Professor Piazzi Smyth, to be used by that gentleman in his recent expedition to Teneriffe.

Mr. Pattinson was elected a Fellow of this Society on the 3rd of June, 1852; he belonged also to the Royal Astronomical, Geological, and Chemical Societies: his death took place at Scots' House, his residence near Newcastle, on the 11th of November, 1858.

The Very Rev. GEORGE PEACOCK, D.D., Dean of Ely, was born on the 9th of April, 1791, at Thornton Hall, Denton, in the parish of Gainford near Darlington, in the county of Durham, and about fourteen miles from Richmond in Yorkshire, being the residence of his father, the Rev. Thomas Peacock, incumbent and during fifty years perpetual curate of that parish, where he also kept a school. His family consisted of five sons and three daughters, three of the sons by a first marriage, and the other two, with the daughters, by a second; George being the youngest son of the five. In early youth he showed no precocity of genius, but was a bold and active lad fond of out-door sports, and, if remarkable for anything, rather for his daring feats in climbing, which sometimes led him into very dangerous situations, than for any special attachment to study. From the nature of his father's occupation, it is not probable that he lacked the usual elementary instructions; but his early reading was desultory, books of voyages and travels being most in favour with him; nor was it until, with a view to his future college career, he was sent at nearly seventeen years of age (in January 1808) to the school of the Rev. Mr. Tate (formerly a Fellow of Sydney Sussex College, Cambridge) at Richmond, that his great natural powers began to develop themselves. Here, however, he applied himself with diligence to the studies of the school, and with such success, that at the July examination he was placed alone, by a decided superiority, at the head of his class, in which it may be noticed were two boys who afterwards became Fellows, and four others who became Scholars of Trinity College. He did not live in Mr. Tate's house, but in lodgings near it, and had his evenings uninterrupted for study, which he used to such purpose as to have read far in advance of the classical course of the school, and to have obtained an accurate knowledge of the niceties of Greek criticism, as well as a habit of sound rendering both of the Greek and Latin classics. During one or more of the vacations, particularly the summer one of 1809, he also read mathematics with Mr., afterwards Dr. Brass, at that time a distinguished Undergraduate of Trinity, from the town and school of Richmond, and who subsequently took a Wrangler's degree. It would seem, however, that up to the period of his entry at Trinity College in October 1809, his mathematical reading had not extended much beyond the first year's subjects then studied at Cambridge. We

have the testimony of one of his schoolfellows, afterwards himself a distinguished ornament of the same University and College, that during his whole time at Richmond, "though a severe student, he was a joyous, sociable, and genial spirit, always ready for good companionship, for any pleasurable excursion, for manly exercise, and for all innocent mirth and playfulness." How well calculated, as a teacher, Dr. Tate must have been to bring forward the powers and to win the affectionate regard of his pupil, may be gathered from the terms in which their connexion is spoken of in the dedication of his first considerable mathematical work,—terms which indicate more than an ordinary community of feeling and facility of intercourse between the pedagogue and the pupil.

During the first year of his residence as an undergraduate at college, he does not appear to have applied himself with any extraordinary diligence to the studies of the place; but this temporary relaxation of energy was amply compensated during the remainder of his pupillage by a very extensive and conscientiously accurate course of mathematical reading, which issued in his taking the degree of Second Wrangler in January 1813. Shortly after the examination for the degrees, he also gained one of the Smith's prizes.

In 1812, being the earliest period at which, as a sizar of his college, he was allowed to compete, he obtained a Scholarship, and on his first offering himself as a candidate for a fellowship (in 1814), was elected to one of the only two then vacant, his extensive classical knowledge no doubt standing him in stead on that occasion. In the subsequent year he was appointed Assistant Tutor and College Lecturer; in 1823, Full Tutor, conjointly with Mr. Evans; and finally, in 1835, Sole Tutor of the "side" which bore his name in that great and venerable establishment, an office which he held till called away from the performance of its duties by his appointment to the Deanery of Ely in 1839, when he also took the degree of Doctor of Divinity, having been admitted into Holy Orders in or about the year 1817. In one of the summer vacations in this interval (1816) he visited Italy.

Of his conduct in the important and responsible office of tutor, there has never been but one opinion in the University. While his extensive knowledge and perspicuity as a lecturer maintained the high reputation of his college, and commanded the attention and

admiration of his pupils, he succeeded to an extraordinary degree in winning their personal attachment by the uniform kindliness of his temper and disposition, the practical good sense of his advice and admonitions, and the absence of all moroseness, austerity, or needless interference with their conduct. "His inspection of his pupils," says one of them, "was not minute, far less vexatious; but it was always effectual, and at all critical points of their career, keen and searching. His insight into character was remarkable."

It was impossible for any one, at the epoch of his undergraduacy, and for several years preceding that epoch, drawn on to read extensively in mathematics for the sake of the science itself, and thus becoming aware of the progress made on the continent in that department of knowledge, while at the same time subjected to the course of reading then pursued for the Senate-house examinations, not to become at the same time unpleasingly sensible to what we must now consider the discreditable state of Cambridge mathematics then prevalent. Peacock, in common with many other students of his own standing, was profoundly impressed with this, and resolved, so far as in him lay, to contribute towards remedying the evil. Accordingly we find him, so soon as relieved from the pressure of examinations, exerting himself vigorously in the cause of mathematical improvement. As a preliminary step towards introducing the continental methods and the spirit of the higher analysis, he joined with two fellow-students of his own year (Messrs. Babbage and Herschel) in the task, more useful than brilliant, of translating the smaller work of Lacroix on the differential and integral calculus. This translation, published at Cambridge in 1816, was followed by a copious collection of examples in 1820; and, the sale of both being rapid, contributed no doubt materially to further the object in view. His position as Moderator for 1817 supplied him with a powerful lever for urging forward this movement, and he was not backward in availing himself of it. In his questions for the Senate-house examination for that year, the differential notation of the continental analysts was for the first time *officially* employed in Cambridge; an innovation which passed not altogether without censure. How little this affected him will appear from the following extract of a letter to a friend, which we have before us, dated March 17, 1817.

"I assure you, my dear ———, that I shall never cease to exert

myself to the utmost in the cause of reform, and that I will never decline any office which may increase my power to effect it. I am nearly certain of being nominated to the office of Moderator in the year 1818-19*, and as I am an examiner in virtue of my office, for the next year I shall pursue a course even more decided than hitherto, since I shall feel that men have been prepared for the change, and will then be enabled to have acquired a better system by the publication of improved elementary books. I have considerable influence as a lecturer, and I will not neglect it. It is by silent perseverance only that we can hope to reduce the many-headed monster of prejudice, and make the University answer her character as the loving mother of good learning and science."

Nor was it only towards placing on a better footing the purely mathematical studies of the University that his aspirations were directed. In the best spirit of a faithful and devoted son of Alma Mater, he repudiated the idea of her approaching decrepitude, and contended for her progress in all the great lines of scientific distinction. He was one of the most zealous promoters of the establishment of an Astronomical Observatory at Cambridge, and succeeded, in spite of considerable opposition, in procuring the appointment of two successive Syndicates for the consideration of the subject, and finally in carrying it triumphantly through the Senate. The result, it need hardly be remarked, has brilliantly justified the effort. He was also one of the first members of the Cambridge University Philosophical Society founded in 1819,—a body, which has established a well-earned scientific reputation, and of which he held the office of Vice-President in 1831 and 1840, and of President in 1841-42. He was also one of the earliest members of the Astronomical Society, which he joined immediately on its foundation in 1820. In 1818 he became a Fellow of the Royal, and subsequently of the Geological Society.

In 1825-26 he contributed to the *Encyclopædia Metropolitana* an article on Arithmetic, which has been designated by one eminently qualified to form an opinion on every point of mathematical history, as "the most learned work on the history of that subject which exists," and which, entering as it does into the details of the arithmetical nomenclature, notation, and methods of every age and lan-

* This was the case. He was also Senior Moderator in 1821.

guage, must have been the result of a world of reading and toilsome antiquarian research. In 1830 he supplied by his treatise on Algebra one of the greatest deficiencies in our whole circle of mathematical reading,—that, namely, of a sound elementary work on that subject based on truly philosophical principles, and explaining the true gist and nature of symbolical reasoning, in its relation to ordinary arithmetic and the science of concrete numerical magnitude, and pointing out (on the principle of the ‘Permanence of equivalent forms’) the origin and the solution of many of those difficulties which were usually slurred over by the student, in a way little conducive to the formation of clear logical habits of thought. In this remarkable work, the ideas propounded by Buée, Argand, Mourey and Warren, respecting the geometrical interpretation of imaginary symbols, were for the first time presented to the student in an elementary treatise as part and parcel of the general subject, and as intimately interwoven in the very texture of the algebraic methods; thus preparing them to understand and appreciate those more abstruse and powerful systems of imaginary representation subsequently developed in the double and triple algebra of Professor De Morgan and the quaternions of Sir William Hamilton. A report which he presented to the British Association in 1834, “On the recent progress of certain branches of Analysis,” afforded him the occasion of still further maturing his views of the subject; and finally, in 1842 and 1845, he published in two successive volumes a more elaborate and complete treatise, in which the purely arithmetical or technical view of algebra is presented quite separately from the purely symbolic or formal one, and which leaves little to desire in respect of metaphysical completeness, and nothing in that of lucid exposition. The position which he then held in the University, as Lowndean Professor of Mathematics (to which office he was elected in 1837), identifies this work with the University in which it was produced as a contribution to scientific literature of which it may well be proud.

In this, his capacity of Lowndes Professor, he at first gave a series of lectures on practical and theoretical astronomy; and when, by mutual arrangement with the Plumian Professor, these lectures, belonging more properly to the department of the latter, were given by that officer, he delivered a course on geometry, and for three suc-

cessive years attempted to form a class for a course on the principles of analysis and their application. Those who are conversant with the mode in which the mathematical studies of the junior members of the University are prosecuted, will not be astonished that the attendance was small. Not discouraged, he attempted to form a class for astronomy, but though at first successful, the attendance was not maintained in subsequent years.

In 1838 Professor Peacock was appointed a member of the Parliamentary Commission for considering the steps to be taken for the restoration of the Standards of Weight and Measure destroyed by the burning of the Houses of Parliament. To the duties of this Commission he gave his diligent attention, and it was indebted to him for many valuable and useful suggestions. Of the Second Commission, appointed in 1843 to carry out the report of the first by the construction of new standards, he was also a member.

In 1839 he was appointed to the Deanery of Ely, vacated by the death of Dr. Wood, and with this appointment ceased, of course, his connexion, as Tutor, with Trinity College, and his residence at Cambridge other than such as the duties of his Professorship required. In this position it is too little to say that he conscientiously devoted himself to the performance of its duties. He went into them with all the zeal of an earnest and pious spirit, and with all the energy and prudence of an able and practical administrator. The venerable and beautiful fabric of the Cathedral had fallen into grievous decay, and had even become endangered by neglect. Its restoration became one of his principal objects, for the accomplishment of which he exerted himself with such success, that it remains distinguished as one of the most beautiful specimens of our ecclesiastical architecture. He laboured hard to introduce, and he succeeded in effectually introducing into the city of Ely, in spite of much opposition, the sanitary measures required by the Public Health Act; the result being a material improvement of the recorded salubrity of the place. Its educational establishments, especially the schools more immediately connected with the Chapter, received from him the most assiduous attention and active support, and its public charities his vigilant supervision. These duties, however, neither withdrew him from the pursuit of science, nor from his favourite and cherished object of University Reform. In his *Life of the late Dr. Young*, and

in his collection and republication of his numerous and important papers and memoirs, originally printed either as separate works, or in the Transactions of this Society and various journals and periodical works, he has conferred a lasting benefit on Science while doing justice to one of its most distinguished ornaments. There can be no doubt that this work must have cost him a vast amount of labour. Few scientific writers, thinking so profoundly and arriving at such important conclusions, have adopted a form of exposition so obscure and difficult to follow as Dr. Young. The discussion of these memoirs in the Biographical volume of Dr. Peacock's work, however, shows that he had completely overcome this difficulty, and obtained a perfect appreciation both of their merit and method. In the Archæological department of this work he had for a coadjutor Mr. Leitch, who edited the volume devoted to Dr. Young's Hieroglyphical discoveries. This work occupied him at intervals spread over a period of twenty years, and was only published in 1855, three years before his own decease.

Dr. Peacock was an active member of both the Cambridge University Commissions (of 1850 and 1855). Earnestly devoted to the improvement of the University system, he had early made its statutes and history an object of especial study, and had stated, in the form of observations published in 1840 on its constitution and studies, and in 1841 on its statutes, the result of his impressions on a variety of points in which he conceived amelioration practicable. He came therefore to this arduous and by no means popular duty fully prepared, by intimate practical acquaintance with the working of the then existing system, and by long meditation, resulting in an entire conviction of the desirableness of a very considerable amount of change in the directions indicated in the Report of the first Commission. These views he throughout supported, however, with perfect candour and moderation, and with an earnest desire, as far as possible, to conciliate opposition, and to wound no private or individual feeling.

In 1841 he accepted the office of Prolocutor of the Lower House of the Convocation of Canterbury, which he filled till 1847, and again from 1852 to 1857; an office for which the well-known temperateness of his views on all those subjects where, in imperfectly-balanced minds, strong feeling is apt to degenerate into passionate

advocacy, the weight of his character, and the uniform dignity (combined as it always was with exceeding courtesy and gentleness) of his personal bearing, peculiarly fitted him.

His health, which in the earlier days of his residence at Cambridge, after taking his Bachelor's degree, had not been strong, latterly gave way under the influence of repeated attacks of influenza and bronchitis, which necessitated his passing the winters in warmer residences. That of 1848 he passed in Madeira with every promise of permanent benefit. The disorder, however, recurred in succeeding winters, and was aggravated in 1857 by an attack of dysentery. On the 28th of October in the present year he attended a meeting of the University Commission, from which returning, he took to his bed, exhausted by the effort, to rise no more—a striking comment on the expressions used by him in his letter above cited. His decease took place on the 8th of November, 1858.

Dr. Peacock married, in 1847, Frances Elizabeth, second daughter of W. Selwin, Esq., Q.C. He has left no family. He was for several years a Vice-President of this Society; in 1830–31, and various subsequent sessions down to 1856–57, he acted as a Member of the Council. Few men have left behind them a memory more cherished, or been attended through life by more universal manifestations of affectionate regard and reverential esteem.

MAJOR-GENERAL SIR WILLIAM REID, K.C.B., was born on the 25th of April, 1791: his father was a Minister of the Established Church of Scotland, at Kinglassie, in Fife, and with slight previous advantages of education, he was sent, soon after he entered his fifteenth year, to the Royal Military Academy at Woolwich. Young Reid made rapid progress, completed his course of study before he had attained his eighteenth year, and was sent, as was at that time the custom, to the Ordnance Survey, then directed by Colonel Mudge, Royal Artillery: in February 1809, he was commissioned in the Royal Engineers. In those stirring times the interval was short between the hall of study and the field. Lieutenant Reid joined the army of Wellington in 1810, was present at the first unsuccessful siege of Badajoz in April 1811, and at the final capture of that fortress twelve months later. Early and continuously conspicuous for his zeal, intelligence and energy, even among the very many young officers of Engineers who greatly distinguished themselves in that

war, he took part, while yet a subaltern, in the sieges of Ciudad Rodrigo, Burgos, and St. Sebastian, in each of which he was wounded, and in the battles of Salamanca, Vittoria, Nivelle, Nive, and Toulouse. He did not obtain his Captaincy until 1814. He was present at the bombardment of Algiers under Lord Exmouth in 1816; and he took an active part, twenty years later, in the operations of Sir de Lacy Evans in Spain, where he commanded the Engineers of the British auxiliary force.

Ever ready, however, as he was, to follow the leadings of his own profession, his active mind was not less alive to its scientific interests. He was the contributor of nine papers to the 'Professional Papers' of the Royal Engineers, usually on technical subjects; but sometimes on subjects, such as the movement of the shingle along our coasts, which are more nearly related to his favourite studies. It was in 1832 that his mind first received the bias which he afterwards followed with so much distinction and success. It fell to his lot, as the officer of Engineers at Barbadoes, to have to re-establish the Government buildings blown down in the hurricane of the 10th of August, 1831: no less than 1477 persons out of a population of about 130,000 lost their lives on that occasion, and property to the value of more than £1,600,000 was destroyed. The devastation and misery he witnessed, led him, in his own words, "to search everywhere for accounts of previous storms, in the hope of learning something of their causes and mode of action." In this he was materially assisted by the previous labours of Mr. Redfield of New York, who, as early as 1831, had published in the 'American Journal of Science' the first of a numerous series of papers in which he demonstrated, not only that the storms of the American coast were whirlwinds, in opposition to high authorities, who maintained that the direction of the wind is rectilinear, but also traced some of them from the West Indies to the sea-board of the United States, and proved that they were progressive whirlwinds, moving forward on curved tracks with a considerable velocity. Fully acknowledging his obligations to this great meteorologist, Lieut.-Colonel Reid set himself to confirm and extend his deductions, by a laborious collation of the log-books of British men-of-war and merchantmen. Impressed also with the idea that to the south of the equator, "in accordance with the regularity nature follows in all her laws, storms would be found to move in a directly contrary direction," he endeavoured to collect

such facts as would aid further inquiry on that subject. None but those who have attempted a like task can fully appreciate its difficulties,—observations which the investigator dare not reject, although convinced that they are wrong, provoking silence where a word would clear up a doubt,—still more provoking record of useless details, to the omission of those that are important; nevertheless he persevered, and, gaining confidence in the key he had obtained to the real nature of these intricate phenomena, he ventured in 1838 to lay down, for the guidance of the seaman, those broad general rules of navigation which are known as the law of storms. He showed that it is possible to deduce from the facts, rules applicable to every emergency; to tell unerringly when ships must run before the hurricane, when they must lie to, and on which tack, so as to avoid being taken aback by the veering of the wind; lastly, how to anticipate its coming changes, and shape the course which best turns them to account.

The announcement of this law, so important to the mariner, and to every naval and commercial nation, was received with the greatest interest by the scientific world; and Lieut.-Colonel Reid's work, entitled 'An Attempt to develop the Laws of Storms,' has gone through several editions, and has been translated even into Chinese.

Lieut.-Colonel Reid was appointed Governor of Bermuda in 1839, an opportunity which he did not fail to improve for pursuing his inquiries: he was transferred to the Government of the West Indies in 1847. Happening at the latter station to entertain the late Dr. Fownes of University College, he induced that eminent chemist to draw up a treatise on rudimentary chemistry for the use of his newly-founded School of Practical Chemistry at Barbadoes: this treatise, which the author presented to him, he first printed for local use, then presented to Mr. Weale, in reference to a design for a series of cheap popular treatises on scientific subjects which he had long previously discussed with that gentleman. It was the parent of the extensive and very valuable series of rudimentary works since brought out by Mr. Weale; but, with characteristic modesty, he requested the suppression of a notice to that effect, which may be seen in the first edition of Dr. Fownes's treatise. Resigning the government of the West Indies, on grounds highly honourable to his sense of independence, Lieut.-Colonel Reid resumed his military duties, and was serving as Commanding Engineer at Woolwich when he was selected

for the difficult post of Chairman of the Executive Committee of the Great Exhibition of 1851. It has been said that his singular simplicity of manner and total absence of pretension caused the distinguished men, with whom he was associated on that occasion, to wonder at first what had led to his selection for the office. They soon discovered, under that simplicity, the patient but genuine enthusiasm, the varied experience, the calm and even temper, and the devotion to the duties of the moment, whatever they might be, which eminently fitted him for it. It is not too much to say that his judicious arrangements contributed materially to the success of that great undertaking, and they were fitly rewarded by the ribbon of K.C.B., and his appointment to the important military command of Malta. To that island Sir William Reid carried all the unostentatious activity which had distinguished his former governments. In a time of extraordinary difficulty, when Malta becoming an *entrepôt* of the first importance to the British Army in the East, all its resources were strained to the utmost, he managed to meet every demand, and while he restrained the political excitements of the day, to carry forward homely designs for the permanent benefit of the people. Thus he founded a botanical school for the working classes; he imported improved agricultural implements; he introduced a new species of the cotton plant, and other seeds adapted to the climate; he established barometers in public places to warn the Maltese fishermen of impending gales; he took in hand the Library of the old Knights of Malta, and by the introduction of modern books, fitted it to be a true public library for a large community. Whatever attainable practical object commended itself to his judgement, that he undertook, with the same quiet determination which in 1851 enabled him to falsify adverse predictions and attain the object to which he was pledged, in the punctual opening of the Great Exhibition.

The Government of Malta was the last public service of Sir William Reid. He returned home in 1858, having two years previously attained the rank of Major-General, and died after a very short illness on the 31st of October. He was elected a Fellow of the Royal Society in 1839, and was appointed Vice-President in 1849.

Sir William Reid was married to a daughter of the late Mr. Bolland of Clapham. His wife died a few months before him, and he has left five daughters.

JOHN FORBES ROYLE, the only son of Capt. W. Royle, H.E.I.C., was born at Cawnpore in 1800 ; educated at the High School, Edinburgh, he was originally intended for the army, but whilst waiting for an appointment to Addiscombe he studied medicine under Dr. A. T. Thomson, and from him derived, in great part, that love for natural history which led him eventually to relinquish the profession of arms and to adopt that of physic. In 1822 he went out to India as an Assistant-Surgeon on the Bengal establishment, in charge of troops, and the following year was appointed to the medical duties of the station at Saharunpore, together with the superintendence of the Company's Botanical Gardens at that place ; a post which he held for nearly ten years. Here he enjoyed ample opportunities for studying the natural history of the Northern provinces, and employed all the time which he could spare from the active duties of his profession in collecting specimens of plants, vegetable productions, and minerals ; in amassing information of every kind bearing on the arts, commercial produce, and medicines of India ; and in minutely observing the phenomena of tropical vegetation, as influenced by soil, climate, cultivation, and surrounding circumstances.

Dr. Royle returned to England in 1831 on furlough, bringing with him collections of great extent and value ; and for several years was engaged in the study, examination, and arrangement of the materials he had collected, and in generalizing and digesting the facts he had observed. The result of these labours was published in 1839, in his "*Illustrations of the Botany and Natural History of the Himalaya Mountains and Cashmere*," a work remarkable for the large amount of useful and practical information which it contains ; including, at the same time, an elaborate systematic account of the botany of these parts of India, enlarged and comprehensive views of the climate of the country and the influences of meteorological phenomena on its vegetation, and abundant and minute details of the various vegetable productions forming articles of export, or used in the arts and manufactures of the natives. Especially valuable too, in a practical point of view, are the technical generalizations with which the work abounds ; in which the careful study of years is brought to bear on the economical production of cotton, tea, corn, and other similar substances ; the exact laws of scientific research being employed to indicate new and improved methods of cultivation or production.

In 1837, on the retirement of Dr. Paris as Professor of *Materia Medica* in King's College, London, Dr. Royle was elected to the vacant chair ; on this occasion he published "An Essay on the Antiquity of Hindoo Medicine," a work of much research, and one alike valuable to the medical man, the antiquary, and the philologist. In 1845 he brought out a "Manual of *Materia Medica*," as a text-book for the students attending his lectures at the College, which rapidly passed through several editions both at home and abroad.

A special department of correspondence, relating to vegetable productions, was founded at the East India House in 1838, and confided to Dr. Royle, and to the duties of this office his best energies were devoted for nearly twenty years ; it was an occupation peculiarly congenial to his taste and to the bent of his mind, as he was, to some extent, able practically to carry out those views, which in the earlier part of his life he had gradually deduced from scientific observations and theoretical considerations. In connexion with this office he published three valuable technical works on India ; namely, in 1840, "An Essay on the Productive Resources of India ;" in 1851, "An Essay on the Cultivation of Cotton ;" and in 1855, "An Essay on the Cordage-Plants and Vegetable Fibres of India ;" besides numerous smaller works and pamphlets on similar subjects.

Dr. Royle was a warm and active supporter of industrial exhibitions. Fully alive to their vast value and importance in a commercial point of view, he was mainly instrumental in obtaining from India those extensive and valuable illustrations of Eastern arts and produce, which excited so much interest at the great International Exhibitions of 1851 and 1855 ; and at the time of his death he had just completed the formation and arrangement of a technical museum at the East India House, designed especially to exhibit the arts and productions of India, and to illustrate its boundless capabilities and resources.

Though chiefly known as a botanist, Dr. Royle was well-skilled in other branches of natural history, and was an active member of most of the societies devoted to them ; at different periods he filled the duties of Secretary to the Geological and Horticultural Societies, and repeatedly served on the Councils of the Royal and Linnean Societies. As a botanist, his careful and laborious habits, and accuracy of observation, give authority to his writings and weight to his opinions ;—as a technical writer his works possess a peculiar value, from the

circumstance that he combined at the same time, high scientific attainments, accurate geographical and commercial information, sound practical knowledge of the arts and manufactures, and an intimate acquaintance with the habits, customs, and prejudices of the people of India, and a full appreciation of the capabilities of the country.

RICHARD HORSMAN SOLLY, born in 1778, was educated and took his degree at Magdalen College, Oxford; he entered for the Bar, but being heir to an ample fortune, he relinquished the legal profession as soon as he had completed the preliminary course of study; treating it rather as an amusement than as an occupation, and abandoning it as soon as he had been called to the Bar. At an early age he became attached to scientific pursuits, joined most of the scientific societies of London, and took an active interest in their management and welfare. He was one of the original promoters of the Royal Institution in 1800, and during a period of more than forty years was a constant attendant at its meetings and an active member of its committees. He also took part in the formation of the Geological and Horticultural Societies, serving repeatedly in the Council of the latter as well as of the Linnean Society. He was a warm supporter of the Society for the Encouragement of Arts, and for a period of many years was unwearied in attending its meetings, and ever liberal towards its objects; a large number of the mechanical engravings which embellished the Transactions of that Society, were furnished at his expense.

Mr. H. Solly was elected a Fellow of the Royal Society in 1807, and without pretending to high scientific standing in any one department of knowledge, was possessed of a very considerable amount of general information in most branches of natural science, more especially vegetable physiology and systematic botany; and though seldom occupying himself with original observations or investigations, he did good service in the cause of science, being always ready to aid young inquirers with advice, encouragement, and pecuniary assistance.

In connexion with the Society of Arts, he devoted much careful consideration towards improving the mechanical and chemical processes of the engraver, more especially with reference to the printing of bank-notes and other similar documents of such elaborate designs and perfect execution as should render forgery impossible. In the

same society, too, he contributed mainly towards the improvement of the microscope, directing his attention from year to year to the various schemes brought forward for perfecting that instrument, and seeking by the offer of special prizes to call forth its improvement in those points in which superior excellence was most to be desired.

THOMAS TOOKE, Esq. was the eldest son of the Rev. William Tooke, F.R.S., author of various literary works, and chaplain of the English Factory at St. Petersburg. Thomas Tooke was born in that city on the 29th of February, 1774 ; and after undergoing a general education, entered early in life into active mercantile pursuits as partner in one of the largest houses engaged in the Russian trade. During this period, Mr. Tooke laid the foundation of that accurate and surprising knowledge of detail in connection with commerce and political economy which enabled him to raise, upon so wide and solid a basis, the economical doctrines and discoveries inseparably associated with his name.

These assumed a palpable form in a work which he published in 1823, entitled "Thoughts and Details on High and Low Prices," the prelude to his great work "The History of Prices," the first two volumes of which appeared in 1838, the third and fourth in 1840 and 1847, and the two closing volumes, in which he was assisted by Mr. Newmarch, in 1857.

This remarkable work, evincing a rare combination of practical wisdom, sound judgment, and great knowledge of commercial statistics, caused the author to be regarded as a most distinguished writer on the science of political economy. The Royal Society testified their sense of his merits by electing him a Fellow on the publication of his first work, and the French Academy more recently elected him a Corresponding Member.

Nor were Mr. Tooke's labours confined to authorship. He was an active participator in the inquiries and legislation connected with the social reforms of the last five-and-twenty years. He took a leading part in the Factory Worker's Commission, and was the Chairman of the Commission for investigating the difficult subject of the employment of children. For a long period he presided over the Royal Exchange Assurance Corporation and the St. Katharine's Dock Company ; and was one of the founders of the Statistical

Society, in which he took great interest. Mr. Tooke was also one of the early promoters of the London and Birmingham Railway; and the celebrated Merchants' Petition in favour of Free Trade emanated from him. At that period (1821), he projected and founded the Political Economy Club, which still exists.

Thus, the active sphere occupied by Mr. Tooke was of scarcely less importance than his pursuits as a philosopher, and his name will be always associated with the great social improvements of this century, as for nearly fifty years he applied his high mind and great acquirements to purposes of practical legislation, which have been conducive of much public good. Mr. Tooke died at his residence, 31 Spring Gardens, on the 26th of February, 1858, in his 84th year; and it was only within the last few months prior to his decease, that he manifested very sensibly the decay of powers generally incident to his extreme age.

BENJAMIN TRAVERS, Esq.—This eminent surgeon was born in London, on the 3rd of April, 1783, so that he was ten years old when John Hunter died. In his sixteenth year he betook himself to the great Hospital School of Anatomy and Surgery in the Borough, then superintended by the elder Cline and Astley Cooper.

In the year 1800 he was apprenticed to Sir Astley at Guy's Hospital. This connection at once secured for him all the advantages and best privileges of a student's life. His career was early marked by great ardour and diligence, and a sojourn at Edinburgh during the Session 1806–7 (after passing his examination at the London College), was always spoken of by him, as a period of unbounded delight, and keen interest, in all that pertained to the prosecution of his medical studies. Here he formed many lasting friendships; and the names of Thomson, Barclay, and Gordon, amongst others, might be mentioned as being descriptive of the eminent men whose society he more especially sought and appreciated at this important epoch of his educational career.

On his return to London he quickly gathered about him a large class of pupils to attend the anatomical demonstrations which he delivered at Guy's Hospital, and in this practice he persevered for several successive seasons.

Mr. Travers obtained no professional employment until the year

1809, when he was appointed to the lucrative post of Surgeon to the East India Company's Volunteer Corps. This piece of good fortune at once determined the aspect of his future life. He was a man of great natural endowment, to which was added the charm of manners, to say nothing of an exquisite tact and great tenderness in dealing with the misfortunes of others. It is well known that for these reasons Mr. Travers was always held in the highest esteem, both by the profession and the public.

In 1810, on the death of Mr. Saunders, Mr. Travers joined Dr. Farre at the Eye Infirmary in Charterhouse Square. This appointment speedily brought with it a great accession of private business. To this connection the profession is indebted for one of Mr. Travers's earliest and most popular works, "The Synopsis of Diseases of the Eye." This book speedily ran through three editions, besides being republished in America, and translated into Italian by Dr. Apolloni, a physician of Pisa. It possesses the great merit of being founded on original observation, and was long held in much regard as a Text-Book, though since superseded by larger and more ambitious publications.

No Hospital Surgeon ever attained a wider or more justly-deserved reputation for a profound knowledge of eye-disease than the subject of this notice. His papers on Cataract in the *Medico-Chirurgical Transactions*, and the treatise above mentioned, were received at the time as masterpieces of accurate symptomatology; they abound in new facts, and form an elegant and comprehensive digest of all that was then known touching various important points of practice.

At the time of Mr. Travers's appointment to the office of Surgeon to St. Thomas's Hospital in 1815, the post was one of extreme independence, and the field of observation has at all times been very extensive.

So long as his health lasted, Mr. Travers availed himself of this splendid opportunity to its fullest extent, and we soon find him associated in the surgical course with his great colleague and former master Sir Astley Cooper, then in the zenith of his fame as an operator and a lecturer on Surgery. Mr. Travers, unfortunately, soon found that his bodily vigour was not such as would enable him to maintain his post as a lecturer; he was one night carried from the Theatre in a fainting fit, from which for some time it remained doubtful whether he would

ever rally. He thus felt himself most reluctantly compelled to forego one of the great and early objects of his ambition, but in compensation for this it may be remarked, that had he retained his post as Sir Astley's colleague in the Surgical Chair, he probably never would have penned the "Treatise on Constitutional Irritation," a production, which has long since secured for its author a European reputation.

Early in this century, Dr. Jones had explained the operation of a single ligature upon the coats of an artery, and dispelled the obscurity which had gathered round this question. There were, however, some material points of doubt and discussion still remaining to be dealt with. These the subject of our memoir finally and completely elucidated by experiment, so that the causes of secondary hemorrhage are now well ascertained, and are far more effectually guarded against than was the case before the appearance of Mr. Travers's papers in the fourth and ninth volumes of the "Medico-Chirurgical Transactions." It was after his appointment to St. Thomas's that he perfected this inquiry, by proving, on the person of a patient under his own care, that a ligature may be withdrawn fifty hours after its application, without risk, and successfully, so far as concerns the obliteration of the trunk of the brachial artery. A similar result was obtained after tying the carotid in the horse and ass, although the ligature was removed so early as twelve or even nine hours after its original application. On one occasion Mr. T. removed a ligature from the femoral artery of a man twenty-seven hours after tying that vessel for a popliteal aneurism, but here pulsation returned and the experiment failed. This suggestion, or rather the discovery of these effects of the temporary use of ligatures, was entirely original, as well as the announcement of another new fact, to which we shall now make some allusion.

In 1811 Mr. T. communicated to the Royal Society an account of some experiments which exhibit the means adopted by nature for the cure of wounded intestines. This paper was accepted for publication, but it was withdrawn to form the groundwork of a larger treatise, published in 1812, which was most favourably received by the profession. It is there proved that if the intestine of a dog be strangulated by a single ligature, the ulcerative inflammation provides for the escape of the thread into the cavity of the bowel; nature at the same time restoring the wall of the gut by a deposit of lymph, which undergoes a rapid organization. Of the great work on Constitutional

Irritation, we have little more to say in the brief space assigned to us, than that it is truly "the work of a master." It consists of two parts: the first contains an account of the direct effects of local irritation upon the great centres of life; the heart, the brain, and nervous system. The second is a more elaborate production: it embraces a review of all those obscure relations between parts and centres respectively, which the author terms "reflected," wherein the latter are not abruptly roused to a direct response and sympathy with the local excitement, but where the action passes on, *via* the system, to some other tissue or organ of the body, or is remitted back from the centres directly to the offending part, as shown by the specific form or type of the local changes. This is the most profound portion of the whole work; the author was always diffident of the success of this second part of the inquiry; he felt he should not be understood, and yet, to use his own majestic phrase, "he sought to rise to the dignity of a discourse upon the philosophy of Surgery."

Mr. Travers contributed largely to the best periodical literature of his time. These productions are for the most part to be found in the earlier volumes of the "Medico-Chirurgical Transactions," nor must we omit to mention that his first paper narrates the success of an operation performed for the cure of a remarkable aneurismal tumor. On this occasion Mr. T. tried the common carotid artery. The woman perfectly recovered. At that time this operation had only once before been performed successfully by Sir Astley Cooper. The two papers on Malignant Disease, and a small theoretical discourse on Syphilis, must not pass without praiseworthy mention, to say nothing of his last work on Inflammation, a crowning effort, worthy of this great disciple of Hunter.

Mr. Travers in early life was a very good operator. He was still young when he first held the Surgeoncy to the Eye-Infirmity. He used to say that a man who can extract the cataract with tolerable success can do anything with the knife. Add to this, that from a very early period he was in the daily habit of cutting down upon arteries, and performing other hazardous experiments upon living animals, which must also have contributed to give him readiness and dexterity as an operating Surgeon.

He lived to achieve all the honours of the race set before him. He was twice President of the College of Surgeons, and had long

passed the Chair at the Medical and Chirurgical and the Hunterian Societies, in addition to the reward finally bestowed by Her Majesty, of creating him one of her Sergeant-Surgeons a few months before his death. He died somewhat suddenly, after having suffered from prolonged illness, at his residence, No 54, Green Street, Grosvenor-square, on the 6th of March, 1858.

In manner and personal appearance he was eminently refined and gentlemanlike. Of such men we may say, with the younger Pliny, "*Accepisse te beneficium credes, quum propius inspexeris hominem, omnibus honoribus, omnibus titulis parem.*"

HENRY WARBURTON, Esq. was the son of a London merchant, and was himself for a time engaged in business. He had, however, passed through a distinguished career at Cambridge, and being possessed of sufficient fortune, he exchanged the pursuit of commerce for science, literature, and politics. He entered Parliament in 1826, and finally retired from it in 1847. The course he usually took as a member of the legislature is well known, and among various measures of public utility in which he had a principal share, we need here only specify, as connected with science, his Chairmanship of the Committee on Medical Education, and his authorship of the Anatomy Act. He was one of the founders of the London University, now the University College, and for many years was a Member of its Council. He was also an original Member of the Senate of the University of London, and continued in that body till the time of his death. He was elected a Fellow of the Royal Society in 1809. He was also an active member of the Geological Society, and in 1843 and 1844, filled the office of President. He died at his house in Cadogan-place, on the 16th of September, 1858, at the age of seventy-three.

Mr. Warburton was always in the habit of keeping up the mathematical knowledge which he had acquired at Cambridge. His mathematical library was extensive ; and the retirement in which he lived, even while he was a member of Parliament, gave him time to use it. It was not until the termination of his public life that he thought of printing any speculation of his own : and it is a remarkable instance of the manner in which even men inured to publicity feel diffidence in entering on a new career, that the veteran politician, accustomed to face overpowering majorities of the House of Commons

with unpalatable propositions, committed his thoughts to a friend to be digested and presented to the Cambridge Philosophical Society, from nothing but timidity at the idea of appearing in person. But by the time the paper was drawn up and publicly read, the real author took heart of grace, and drew up his own thoughts with additions. This paper "On the Partition of Numbers, and on Permutations and Combinations," was printed by the Cambridge Society in 1847. Another, "On Self-Repeating Series," was published in 1854. Both papers show a great command over the German factorial notation, and add several curious theorems to their subjects.

JOHANNES MÜLLER was born in the city of Coblenz, on the 14th of July, 1801. His father, Matthias Müller, was a shoemaker, in a small way of business, but, notwithstanding his narrow means, determined not to deny his son the advantages of a good education. Accordingly, after such tuition as was suited to his earlier years, the boy, in 1810, entered the secondary school or gymnasium of his native town, where for eight years he was instructed in classics, mathematics, and other branches of liberal learning. His rather monotonous life at this institution, which is said to have been carried on in an old-fashioned scholastic way, was relieved, and his mind expanded, by independent reading, especially of Goethe, and by frequent rambles in the country, in which he gratified his love of external nature, and collected plants and animals, for the study of which he showed an early predilection.

At the recommendation of the Director of Schools of the province, Johannes Schultze, who had doubtless noted the intellectual promise of the youth, Matthias Müller had destined his son for a learned profession; and although he did not live to see the fulfilment of his intentions, they were dutifully carried out by his widow. Accordingly in 1819 young Müller was sent to the University of Bonn, having in the mean time, after leaving the gymnasium, gone through a year's military service, as was the custom with those of his age and condition.

Before entering on his university course, the young man had an important question to settle. Born of Roman Catholic parents and nurtured in the same faith, he had when yet a child manifested a desire to be brought up for the priesthood, and this inclination had been fondly cherished by his pious and affectionate mother. The

time had now come for choosing his path; and we are told that it was after three days of anxious communing with himself that he gave up thoughts of the Church, and decided for Medicine.

He remained three years at Bonn, and took his degree of Doctor in December, 1822; having presented an inaugural dissertation on the laws of animal locomotion*, a subject on which he had already published some observations in 'Oken's Isis.' His career at the university was characterized by intense application to study, but with the constant exercise of independent thought, and by a keen relish for original investigation. Prompted by this, though but in the first year of his studies, he engaged in a series of experiments and observations on the respiration of the fœtus, a subject which had been proposed for a prize question by the university; and his essay†, distinguished alike by learned research and by original and varied experiment, was declared the successful one. Müller's scientific tendencies at this period may be also inferred from the fact that he acted as secretary of a Natural History Society established among the students at Bonn, by Nees von Esenbeck.

But while thus intent on the proper work of a student, Müller was not indifferent to the general yearning after constitutional freedom, which, after expulsion of the French, pervaded the liberal mind of Germany; and we are told that he heartily joined the Burschenschaft, and even took part as a leader in that rather enthusiastic association, in which, notwithstanding the ban of the Carlsbad decrees, the academic youth still cherished their hopes of German unity, and laid plans for social improvement.

After taking his degree, Müller went to Berlin to pass his examinations for licence to practise (Staatsprüfungen), and continued for a year and a half to prosecute his philosophical and medical studies in that university. He had not gone through his career at Bonn without contracting some leaven of the "Naturphilosophie" with which the leading German schools of biology were then fermenting. Of this however he was radically cleared at Berlin, through the influence of Rudolphi, of whom he became a favourite pupil. Rudolphi was an enemy to subjective speculation in biological science; he looked on the so-called philosophy as mistaken and futile in its application to the phenomena of the animal economy, and based his physiology

* Diss. Inaug. de Phoronomia Animalium. Bonnæ, 1822.

† De Respiratione Fœtus. Commentatio physiologica. Lipsiæ, 1823.

chiefly, and perhaps rather exclusively, on the study of the animal structure. Of the encouragement and aid received from that excellent man, Müller afterwards spoke in the most grateful terms, and he declares that it was through the influence and example of Rudolphi that his scientific pursuits were afterwards turned so much to comparative anatomy.

Müller returned to Bonn in 1824, and in October of the same year began his career as an academical lecturer in that university. In 1826 he was made Professor Extraordinary. In the meantime, however, the duties he imposed on himself as a teacher had been unusually onerous, and to these was added unremitting employment in original investigation, with all its concomitant labour and thought. Such overstrained exertion brought on a state of bodily exhaustion and mental depression, which in 1827 obliged him wholly to lay aside work for a season, and to seek for health and recreation in a journey up the Rhine, and through the south of Germany, in which he was accompanied by his newly-married wife. Returning with recruited health, and resuming his duties in Bonn, he was in 1830 promoted to the grade of Professor in Ordinary; and in the spring of 1833 he was called to occupy the chair of Anatomy and Physiology in Berlin, which had become vacant by the death of his friend and preceptor, Rudolphi.

Of the works published by Müller during his stay at Bonn, the first in point of time was one "On the Comparative Physiology of Vision," which appeared in 1826*. This was immediately followed by a smaller essay "On the Phantasmal Phenomena of Vision†," a class of phenomena which had greatly interested and attracted Müller when a boy, and in the contemplation of which, as he himself informs us, he used to give free play to his fancy. The appearances, thus become early familiar to him, he subjected in maturer years to philosophical scrutiny, and the work in which they are described and discussed forms properly the continuation of the larger treatise on vision which preceded it. Of this treatise, the leading characteristics are, according to the opinion of one well qualified to judge‡, the masterly application of anatomy, physiological experiment, phy-

* "Zur vergleichenden Physiologie des Gesichtssinnes des Menschen und der Thiere," &c. Leipzig. 1826.

† "Ueber die phantastischen Gesichtserscheinungen," &c. Coblenz. 1826.

‡ Professor Theod. L. W. Bischoff, of Munich, in his "Festrede über Johannes Müller." München. 1858.

sics, psychology and other branches of knowledge to the elucidation of the physiology of vision, and the thorough, searching, and many-sided way in which the whole matter is handled.

In an essay "On the Development of the Reproductive Organs," which appeared a few years later*, Müller traced the steps of that process in the embryo of man and animals, detected the minute primordial filament (now known by his name) which gives rise to the oviduct or Fallopian tube, and applied with much success the knowledge thus acquired to the elucidation of certain perplexing malformations which sometimes occur. Pursuing his researches into the intimate structure and development of organs, he was able about the same time to produce his treatise on the secreting glands†. In this well-known work the intimate structure of the organs in question is investigated in the varied conditions which it presents, from the lowest animals to man, and from the embryonic to the perfect state; and one great result of this labour was to establish, on a wider and more satisfactory basis, the true doctrine of the relation of the blood-vessels and gland-ducts, as first correctly conceived by Malpighi. It was also shown that the same kind of secretion might be yielded by glands formed, as far as discoverable, on an entirely different type of construction. It was at this time, also, that Müller, almost simultaneously with Panizza of Pavia, made the discovery of the lymphatic hearts in reptiles; a discovery, which especially deserves notice on the present occasion, inasmuch as it was communicated to this Society and published in the "Philosophical Transactions‡."

When he settled in Berlin, Müller's first care, next to his professorial duties, was the continuation and completion of his "Hand-book of Physiology," commenced before he left Bonn. Appearing in successive parts, the book was at length finished in 1840.

To this important work, so well and favourably known to English readers through the admirable translation of Dr. Baly, it is unnecessary here to make long reference. With defects of construction which detract from its usefulness as a systematic guide to the student of physiology,—although, as a general treatise, unequal in scope to

* *Bildungsgeschichte der Genitalien*. Dusseldorf. 1830.

† *De glandularum secretorum structura penitiori earumque prima formatione*, &c. Lipsiæ. 1830.

‡ Read Feb. 14, 1833. *Phil. Trans.* 1833, p. 89.

the "Elementa" of Haller, and making no pretence to emulate the prodigious learning and elaborate finish of that stupendous work, which occupied its author for the greater part of a long life,—Müller's "Handbook" was accepted, we may almost say, with universal accord, as the most valuable general work on physiology which had appeared in the long interval since Haller's time. And, indeed, the two great physiological writers have much in common. In both, we perceive the same earnest purpose of placing the doctrines of physiology on a basis of fact, the same constant endeavour to extend and consolidate this foundation, or test its validity, by materials and methods placed at their command by their accomplishment in the cognate and collateral sciences. Anatomy, human and comparative, experiments on animals, chemistry, and physical science, in its various departments, are all brought to bear in the investigation of physiological truth.

Müller's work is, moreover, enriched throughout with the fruits of the author's own observation and experimental inquiry, which are sometimes, it is true, given with a detail better suited for a separate memoir than for a chapter in a handbook, but which signally enhance its value as an original source of information. Almost every part of the book affords evidence of this, but it is enough to refer specially to the examination of the blood, the disquisitions on the nervous system, and the valuable experimental investigations on the voice and hearing. Here, as in his other writings, it is characteristic of Müller that he takes nothing on trust; every statement, whether of matter of fact or doctrine, is thoroughly sifted. Difficulties, however perplexing, are never evaded or slurred over; defects, however they may deface the picture to be presented, are never disguised. Every question is resolutely attacked; the result, whether success or failure, is honestly told; and there is no yielding to the temptation, so powerful with writers of systems, of rounding off a rugged subject with smooth plausibilities.

While carrying on his experimental inquiries in physiology, Müller did not neglect the study of pathological anatomy, and he was one of the first to apply the microscope to the study of morbid growths*;

* Ueber den feinen Bau und die Formen der Krankhaften Geschwülste, Berlin, 1838.

still his chief pursuit to the end of his life was comparative anatomy, with occasional excursions into the neighbouring fields of zoology and palæontology. Fishes and marine invertebrata were his favourite subjects. The chief fruits of his inquiries were—his memoirs on the myxinoid fishes; his systematic description (in association with Henle) of the Plagiostomata; the reintroduction into zoology of the placenterous shark of Aristotle; his essay on the Ganoids and on the natural arrangement of fishes; his papers on Rhizopoda; and his remarkable succession of memoirs on the embryology and structure of the Echinoderms. It will not have been forgotten by the Fellows of this Society, that for the last-mentioned discoveries in particular, in addition to his previous labours in physiology and comparative anatomy, Professor Müller received the Copley Medal in 1854.

Of the memoirs on the myxinoid fishes, we may observe, in the language of the President's address on the occasion mentioned, that their title conveys but a faint idea of their scope and importance; for while the anatomy of a particular family of fishes may be said to form the text, there is an ample commentary, rich in new and original matter, in which the structure is compared in other tribes, and the facts sagaciously applied to the elucidation of great questions in animal morphology. Referring to the researches on the Echinodermata, the President thus continued:—"Professor Müller early applied himself to the study of the structure and economy of the Echinoderms. After describing, in a special memoir, the anatomy of the Pentacrinus, so interesting as a living representative of the extinct Crinoidea, and publishing, in conjunction with M. Troschel, a systematic arrangement and description of the Asterida, he was at length happily led to investigate the embryo life of this remarkable class of animals. The field of inquiry on which he entered had scarcely been trenched upon before, and he has since made it almost wholly his own by persevering researches carried on at the proper seasons for the last nine years, on the shores of the North Sea, the Mediterranean, and the Adriatic. In this way he has investigated the larval conditions of four out of the five orders of true Echinoderms, and has successfully sought out and determined the common plan followed in their development, amidst remarkable and unlooked-for deviations in the larval organization and habits of genera even of the same order; and his inquiries respecting these animals have

made us acquainted with larval forms, with relations between the larva and future being ; and with modes of existence ; such as nature has not yet been found to present in any other part of the animal kingdom. Finally, with the light thus derived from the study of their development, Professor Müller has subjected the organization of the entire class of Echinoderms, both recent and fossil, to a thorough revision, and has added much that is new, as well as cleared up much that was obscure, in regard to their economy, structure, and homologies. It is to these researches, which occupy seven memoirs in the 'Transactions of the Royal Academy of Sciences of Berlin,' that more special reference is made in the award of the Medal. Besides their other claims to distinction, they may be justly regarded as revealing a new order of facts in the history of animal development."

Soon after his settlement in Berlin, Müller established the "Archiv für Anatomie und Physiologie," which goes by his name ; and he continued the publication till the time of his death. Besides containing numerous original contributions of his own, and the valuable Annual Reports on the progress of these sciences, drawn up by himself or his able assistants, this Journal, following after "Meckel's Archives," has formed the principal medium of publicity for the labours of the leading physiologists of Germany during the period of its existence ; and the establishment and continued superintendence of it by Müller, in the midst of other laborious employments, must be ever regarded as an important service rendered to science.

What remains of Müller's personal history may be soon told. Only two events, so far as we know, after this time broke in upon the even tenour of his life. In 1848 he was Rector of the University, in a time of civil commotion, when political agitation distracted the academic body, and both students and professors left the lecture room to equip themselves as soldiers. Müller, who in youth had been an ardent "Bursch," was now a sober conservative, and in his mind the aspect of affairs threatened disaster to the State and the University. His situation was one of difficulty and not without peril ; he strove manfully to maintain authority, though with little success ; but even those who took a different view of passing events paid a willing tribute to his honesty of purpose and the personal courage he displayed in most trying circumstances. The other remarkable occurrence in Müller's latter years was the following.

He was accustomed to spend his autumn vacation somewhere on the sea-coast, for the sake of studying marine animals. While he was returning from one of these visits which he had made in 1855 to the coast of Norway with two of his pupils, the steamer, between Bergen and Christiansand, in which he was travelling, was run into by another, and speedily sank. Nearly fifty people lost their lives, and among them one of Müller's companions, a young man of great promise. In a letter to a friend in England, in which Müller gives an account of this deplorable calamity, he says that on finding himself in the water, he at first kept himself up by swimming; but that having his clothes on, he soon became exhausted, and would have inevitably perished, had he not caught hold of a ship's ladder that was floating by. He held on for a long time, and had given up all hope of succour, when he was picked up by a boat from the other vessel. His remaining companion, Dr. Schneider, saved himself in a similar way. This event had a deep effect upon him, and, although he still resorted to the sea-side, he dreaded afterwards to trust himself on ship-board.

Still working hard as before, but with altered spirits, he in the spring of 1858 began to fail in health; he complained of headaches and passed sleepless nights, owing, doubtless, to a recurrence of cerebral disease from which he had twice before suffered in the course of his life. Experiencing no amendment, and at length feeling that his end was approaching, he settled his affairs both public and private; called his son by telegraph from Bonn on the 27th of April, and fixed on the morrow for a medical consultation on his case; but the next morning found him a corpse.

A man of Müller's eminence had of course been enrolled a member of the chief learned bodies of Europe and America. He was elected a Foreign Member of the Royal Society in 1840.

Müller was rather grave and reserved in manner; he was upright in all his dealings, ever ready to perceive merit in others, candid and just in acknowledging the scientific labours of his predecessors and contemporaries. The tidings of the unlooked-for extinction of his laborious and valuable life caused profound sorrow in every part of the world where science is cultivated.