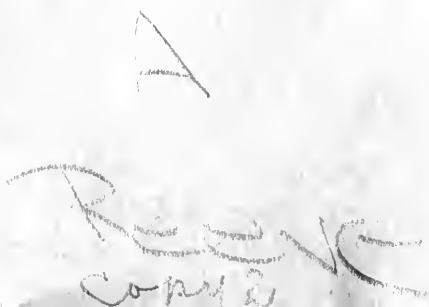

MEN OF EMINENCE

IN LITERATURE, SCIENCE, AND ART

PORTRAITS

OF

MEN OF EMINENCE

IN LITERATURE, SCIENCE, AND ART,

WITH

Biographical Memoirs.

THE PHOTOGRAPHS FROM LIFE, BY ERNEST EDWARDS, B.A.

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SIR JAMES RANALD MARTIN, C.B., F.R.S.

This distinguished surgeon, now Examining Physician to the Secretary of State for India in Council, was born about the year 1800, in the Isle of Skye, his father being the Rev. Donald Martin, his mother a sister of Adjutant-General Sir John Macdonald, G.C.B. Having acquired a knowledge of mathematics, geology, and physical geography at the Royal Academy of Inverness, under Professors Nimmo and Tullock, he resolved to enter the military service in a medical capacity. With this object he became, in 1813, a pupil at St. George's Hospital, London, and devoting himself with earnestness to the study of his profession under the advantages then enjoyed by that institution of the services of Sir Everard Home, Sir Charles Bell, Wilson, and Brodie, he, at the expiration of three years, passed his examination at the College of Surgeons, and in 1817 embarked for India. On his arrival at Calcutta, Mr. Martin passed quickly through the usual probationary course, and having joined the 17th and 59th Regiments, he was nominated Assistant Garrison Surgeon of Fort William. Here he greatly distinguished himself by the prompt skill and humanity which he displayed during an outbreak of malignant cholera, and in 1819 he was appointed First Assistant-Surgeon of the General Hospital of Calcutta. It was at this period that the subject of our memoir commenced that important study of the diseases of Europeans in India which led to the peculiar knowledge of tropical maladies upon which his reputation is mainly based.

In 1821, the Marquis of Hastings, then Governor-General of India, observing the rising talents of James Ranald Martin, and appreciating his unwearied devotion to the interests of the service, appointed him to the medical charge of his Body Guard, and, not

unfrequently in opposition to the Medical Board of Bengal, he carried into active operation several extensive sanitary improvements. In consequence of ailing health, Mr. Martin retired on sick leave to the Island of Mauritius; he returned, however, to his military duties in 1823, when he was summoned to Hyderabad to attend professionally on Sir C. Metcalfe, then dangerously ill; and now commenced a friendship with that illustrious Governor which continued uninterruptedly during the remainder of his life. Mr. Martin was summoned in 1826 to Barrackpore to attend Lord Amherst, and accepted the appointment of First Assistant-Surgeon to the General Presidency; he shortly, however, returned to Calcutta, and settling himself in that city in regular medical practice, he filled successively the offices of Surgeon to the Governor-General, Lord William Bentinck, of Presidency-Surgeon of Calcutta, and of Surgeon to the Native Hospital of Calcutta.

Mr. Martin continued to devote himself to the study of the diseases of both Europeans and natives, especially those of the Delta Ganges or Bengal proper, and drew up for the consideration of the Government a Report of the result of his investigations. In 1832, Mr. Martin originated and performed the now universally adopted operation for the radical cure of hydrocele by retained injection of diluted tincture of iodine. In 1835, he devoted his energies more especially to the subject of medical topography and statistics, and the practical results deduced from this elaborate inquiry being formally submitted to the Governor-General and to Sir C. Metcalfe, it was pronounced to be the most important sanitary measure for India that had been hitherto propounded. The author's suggestions for sanitary reform embraced an area larger than the whole of Europe, and they affected the well-being of more than a hundred millions of souls. Mr. Martin also submitted to the Government, about this time, a comprehensive plan for the cure and prevention of diseases prevailing more especially in Calcutta and its surrounding districts, which led to a Commission of Inquiry into the medical topography and health history of the locality, and to a series of legislative enactments by the Supreme Council of India, which have by their practical issue done a large amount of good, not only to the natives, but also to the resident Europeans. In 1838, Mr. Martin originated the great Fever Hospital of Calcutta, and shortly after, his health failing, he availed himself of the offer of the Governor of Bengal to retire for a time to his

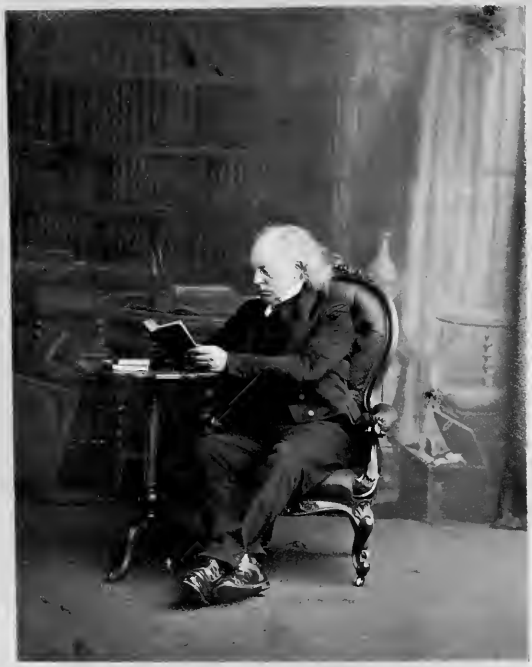
residence at Barrackpore. He still occupied himself, however, in preparing a report on the relative and comparative salubrity of the line of the Valley of Irawaddy, and of that across the Araccan Mountains, in Upper Ava.

In January, 1840, Mr. Martin, to the warmly expressed regret of the Governors of the Native Hospital, left the scene of his twenty-two years' labours—a long period for official service in India—and returned to England. A large meeting of Mr. Martin's patients and friends was convened in the Town Hall of Calcutta, and a subscription was entered into for the presentation of a piece of plate, as a mark of the high esteem they entertained of his personal character and professional services. Sir Charles Metcalfe, writing to him soon after his arrival in London said, in reference to this testimonial: "The just compliment paid to you on quitting Calcutta must have been very gratifying. There is in such an indication of kind feeling, something that touches the heart, and produces some of the most pleasing sensations that we can experience, mixed, however, with pain at parting from those who show such friendship:" while Dr. Farr, of the Registrar-General's Office, alluding to the scientific and economic results of Mr. Martin's services, said, "I look upon the well-conducted sanitary reform commenced in Bengal as one of the most important undertakings of the age in India, useful to science and to England, and creditable to Sir J. R. Martin, with whom it originated."

In 1843, Mr. Martin was elected a Fellow of the Royal College of Surgeons, and has since acted with distinction as a Consulting Surgeon; not, however, to the neglect of his studies in sanitary science, for which he had been famous in India. He was appointed by the Government of Sir Robert Peel a member of the Royal Commission for inquiring into the sanitary condition of large towns in England and Wales, and served two years on this Commission, having in the meantime drawn up a Report, of which a large number were printed by the Government for general circulation. Subsequently, at the suggestion of the Duke of Buccleuch, he directed his attention to the sanitary condition of the French capital, and having proceeded to Paris for that purpose, he collected a number of valuable reports. In 1845, Mr. Martin assisted in publishing the well-known work of Dr. Robert Jackson, 'On the Formation, Discipline, and Economy of Armies,' and in the same year he was elected a Fellow of the Royal Society. In 1848, he

was employed by Government on a commission to report on the capabilities of metropolitan workhouses for the reception and treatment of cholera cases, when his Report was largely circulated. In 1859, Mr. Martin succeeded Dr. Scott as Physician to the India House, and in the following year he received the honour of Knighthood and was made Companion of the Bath.

Sir J. Ranald Martin is the author of a valuable treatise 'On the Influence of Tropical Climates on European Constitutions.' On the abolition of the East India Company, he received the appointment, corresponding to that which he previously held, of Physician to the Council of India.



THE REV. M. J. BERKELEY, M.A., F.L.S.

The department of learning in which the subject of our present memoir ranks as the most eminent of living authors is that of cryptogamic botany. In early life Mr. Berkeley directed his attention to the study of our native land and freshwater mollusks, many of which he delineated with a degree of artistic skill and anatomical accuracy not previously attained in this country; but his genius for minute observation was soon drawn to that wider field of nature which includes seaweeds, mosses, lichens, funguses, and all minute forms of vegetable life, involving the most difficult and delicate microscopic investigation; and to the study of these, especially Fungi, he has devoted his life.

Miles Joseph Berkeley was born at Biggin, in the parish of Oundle, Northamptonshire, on the 1st of April, 1803; and is a lineal descendant of Thomas Berkeley, Esq., of Colwell, Herefordshire, youngest brother of Sir Robert Berkeley, one of the Judges of the King's Bench in the time of the Commonwealth, who was buried at Spetchley, in Worcestershire, where the family are now seated. Having received the earlier portion of his education at the Grammar School of Oundle, Mr. Berkeley proceeded to Rugby. In 1821 he was entered at Christ's College, Cambridge, of which he was a scholar, and in 1825 he graduated as 5th Senior Optime. Mr. Berkeley became attached to natural history from an early period; and his scientific tendencies, both zoological and botanical, which had been fostered at Rugby, were kept in action at Cambridge by an intimate acquaintance with the late Professor Henslow. His first attempts as an author were given in the London 'Zoological Journal,' in some papers on the Anatomy of Mollusca.*

* Some of Mr. Berkeley's early drawings were not published until they appeared in Mr. Lovell Reeve's recent work on the 'Land and Freshwater Mollusks of the British Isles.'

A summer residence at Loch Lomond in 1823, and at Oban in 1824, gave him opportunities of making considerable collections of specimens of the lower forms of animals and plants; and at the latter place he formed an acquaintance with a zealous and well-known botanist of that day, Captain Carmichael, who opened out to him his numerous discoveries in cryptogamic botany. The life of a naturalist is generally marked by a more than common spirit of perseverance and zeal; and we might follow Mr. Berkeley in his numerous researches at Torquay, Weymouth, and other favourite collecting localities on the British coast, but the details of these zoological and botanical explorations are better described in journals appropriated to those subjects. In 1826 Mr. Berkeley was ordained, and after a short residence in two small curacies, he entered, in 1829, on the more important curacy of Margate. His leisure time, though very limited, was still devoted to scientific pursuits, and he pursued his anatomical studies with Mr. G. H. Hoffman, in conjunction with whom he published a detailed anatomy of a curious mollusk inhabiting the swamps of India (*Cerithium telescopium*), from living specimens sent to England by Mr. Benson.

While residing previously at Stibbington, in Huntingdonshire, Mr. Berkeley made a large number of drawings of Fungi, and was so fortunate, in the course of his researches, as to ascertain the real structure of the hymenium in Agarics, though the discovery was not published till some years later. When Sir W. J. Hooker was engaged upon the cryptogamic volume of the 'English Flora,' Mr. Berkeley offered him the use of these drawings, and Sir William thereupon invited him to undertake the preparation of the Fungi. About the same time Mr. Sowerby requested him to record the observations he had made on new and rare Algæ, in a sort of supplement to 'English Botany,' under the title of 'Gleanings of British Algæ.' The volume on Fungi in the 'English Flora' appeared in 1836; and since that period so many collections of exotic Fungi have been submitted to Mr. Berkeley for examination, such, for example, as the Fungi collected during the Antarctic Exploring Expedition by Dr. Joseph Hooker, that he has almost retired from the investigation of other cryptogamic forms, except so far as may be necessary to acquire an intimate acquaintance with their general structure and the development of vegetable tissue.

In 1833 Mr. Berkeley was presented to the two small perpetual

curacies of Apethorpe and Woodnewton, Northamptonshire, which he holds at the present time, and in which he continues to find leisure for his favourite pursuits. A connection with the 'Gardeners' Chronicle' has, during this time, led him to pay much important attention to the diseases of plants, not only as connected with parasites, but with morbid conditions of their tissues; and the results of his investigations have been published in that journal in a long series of articles on vegetable pathology, which, we trust, will ere long be given to the public in a separate form. Among other subjects a study of the Potato Murrain was necessarily induced, and, in later years, of Vine and Hop Mildew. From the very first Mr. Berkeley was convinced that Potato Murrain was due to the agency of a minute fungus (*Botrytis infestans*), an opinion in which he has never wavered, and which is almost universally acknowledged to be correct. In like manner, Vine Mildew was pronounced to be the work of a fungus (*Oïdium Tuckeri*), a decision which was rewarded by the French Government with a portion of the grant of money awarded to those who had worked out the history of this important disease.

In 1857 Mr. Berkeley published a valuable 'Introduction to Cryptogamic Botany,' in one thick octavo volume, and in 1860 a volume of nearly similar dimensions, entitled 'Outlines of British Fungology,' containing descriptions of above a thousand species, copiously illustrated, with a perfect list of the smaller species, which has been followed by an equally elaborately illustrated 'Handbook of the British Mosses.'

Mr. Berkeley was elected a Fellow of the Linnean Society in 1836, and is a Member of several Foreign Societies. The latest honour received by Mr. Berkeley was the award, in the present session, of one of the Royal Society's Royal Medals, with the following address from the President:—

"Mr. Berkeley's labours as a cryptogamic botanist for upwards of thirty-five years, during which they have been more especially devoted to that extensive and most difficult order of plants the Fungi, have rendered him, in the opinion of the botanical members of the Council, by far the most eminent living author in that department. These labours have consisted in large measure of the most arduous and delicate microscopic investigation. Besides papers in various journals on Fungi from all parts of the globe, and in particular an early and admirable memoir on British Fungi,

the volume entitled 'Introduction to Cryptogamic Botany,' published in 1857, is one which especially deserves to be noticed here. It is a work which he alone was qualified to write. It is full of sagacious remarks and reasoning; and particular praise is due to the special and conscientious care bestowed on the verification of every part, however minute and difficult, upon which its broad generalizations are founded. Mr. Berkeley's merits are not confined to description or classification; there are facts of the highest significance, which he has been the first to indicate, and which, in many cases, he has also proved both by observation and experiments. We refer to his observations on the development of the reproductive bodies in the three orders of Thallogens—Algæ, Lichens, and Fungi—and on the conversion, under peculiar conditions, of certain forms of their fruit into others;—to the exact determination of the relations and sometimes of the absolute specific identity of various forms of Fungi previously referred to different tribes; and to the recognition, in many species and genera, of a diversity of methods of reproduction in giving origin to parallel series of forms. As intimately connected with the life-history of Fungi, the intricate subject of vegetable pathology has been greatly elucidated by him; and he is indeed the one British authority in this department. His intimate acquaintance with vegetable tissues, and with the effects of external agents, such as climate, soil, exposure, etc., has enabled him to refer many maladies to their source; and to propose methods, which in some cases have proved successful, of averting, checking, and even curing diseases in some of our most valuable crops. In this line of research he has also demonstrated on the one hand that many so-called epiphytal and parasitic Fungi are nothing but morbid conditions of the tissues of the plant; on the other hand, that microscopic Fungi lurk and produce the most disastrous results where their presence had been least suspected."

SIR GEORGE THOMAS SMART, Kt.,

HONORARY MEMBER OF THE MUSEUM OF SALZBURG, ETC. ETC.

George Thomas Smart, one of the few remaining links between the musical celebrities of the past and present times, was born in London, on the 10th of May, 1776. At a very early age he manifested a taste for music, and gave so promising an indication of correctness of ear, that his father, himself connected with the musical profession, determined to encourage it. Of the three chief metropolitan schools of music then existing—St. Paul's, Westminster Abbey, and the Chapel Royal, St. James's—the last was selected as the best for the training of its future composer and organist; and it soon became apparent, from the assiduity with which he prosecuted his studies under the tuition of Dr. Ayrton, and the aptitude he evinced in mastering the technicalities of the art of composition, that a brilliant career was before him.

Although the tendency of a cathedral training, under which the musical tuition of the Chapel Royal wholly ranges, is much more conducive to promote the cultivation than to facilitate the development of the more serious styles of progressive harmony, yet the youthful aspirant did not permit himself to be trammelled by its heavy rules and severe proportions. Handel had only been dead seventeen years when George Thomas Smart was born, and the influence of that master's majestic compositions, better appreciated afterwards than previously to his decease, was rapidly increasing. The attention of the juvenile student was naturally drawn to Handel's larger and broader compositions. Nevertheless he did not, on this account, neglect that master's lighter specimens, which had been written during his earlier career for the Italian opera,

which he may be said to have introduced into England. These, indeed, he carefully noted and studied, no less than the more stupendous passages of the great German's massive oratorios. Intuitively of a lively and versatile temperament, as he has continued to be throughout a long and highly successful life, George Thomas Smart, upon leaving the Chapel Royal, was attracted to the great metropolitan theatres, where Dr. Arne had made "the power of music" to be so much felt, as to have caused English opera to become a rival of the drama. Into the progress of musical dramatic art he threw himself at once, with the greatest energy; and by the skill with which he arranged and directed the performances at the houses in which he was engaged, he elevated the tone and increased the popularity of this comparatively novel means of public entertainment. During the years, however, in which his more arduous services were demanded by professional and theatrical engagements, he did not cease to pay attention to the cathedral services of the Church; but becoming, at the Chapel Royal, the deputy of Dr. Dupuis, who had given him lessons on the organ, whilst John Baptist Cramer was his master for the pianoforte, and at Westminster Abbey of Dr. Arnold when he had scarcely reached manhood, he prosecuted his studies with the utmost perseverance, being determined to rise in his profession rather by the legitimate means of scholarship and talent than by mere favoritism or patronage. The activity of the early career of George Thomas Smart was indeed a source of constant remark amongst those who were aware of the numerous duties he punctually and assiduously fulfilled; whilst his invariable aptitude for meeting and overcoming difficulties, and his invariable kindness of disposition and happy tact in allaying the differences of contending musicians,—always, like poets and authors, an *irritabile genus*,—endeared him to all classes with whom he was brought in contact.

In the year 1811, being called to Dublin to conduct a series of musical performances, the Duke of Richmond, at that time Viceroy of Ireland, conferred upon him the honour of knighthood, as a mark of consideration for the efficiency of his arrangements, and especially for the manifestation of his musical talents. From that time he was invariably known in his profession as Sir George Smart.

Having now permanently established his reputation, Sir George Smart, on his return to London, assumed the highest grade in the

musical profession—that of an orchestral conductor. The advance of music in popular favour had not then attained to anything approaching the dimensions it has now assumed. The patronage bestowed upon it was, in a measure, merely partial, and emanated rather from the rich and prosperous than from the multitude. The performance of Handel's oratorios, during the season of Lent, attracted some attention; but until Sir George Smart was entrusted with the direction, they met with little consideration, and were shorn of half their importance. During the thirteen years that he filled this arduous post at Drury Lane and Covent Garden theatres, contending against the frivolities of one set of patrons, and the requirements of another, as well as against a large amount of public indifference, he yet managed to assert the claims of the higher works of musical science; and however much he was pained and annoyed at the necessity for interspersing with lighter and more frivolous compositions one part at least of those Lenten entertainments, designated by the name of Oratorios, he permitted no season to pass without having done something to ensure progress. Even so early as the year 1814, the second season of his Oratorio administration at Drury Lane Theatre, he contrived to introduce, on the 25th of February, Beethoven's "Christus am Oelberge," better known in this country as "The Mount of Olives." He also brought out, at the same theatre, on the 10th of February, 1815, that master's celebrated "Battle Symphony." Although, however, the former work failed to obtain the general appreciation to which Sir George Smart was convinced the genius of Beethoven was entitled, it yet marked a period in the advancement of musical science, which led up to that appreciation of the great master which is now of world-wide extent. Of the capability Sir George Smart manifested at this period of his career as a conductor, it was well said by a severe but honest critic,—"That no man in the profession possessed so large an experience, so acute and so sound a tact, so profound a judgment in apprehending what would take most surely with the public, such unwearied energy and steadiness in the prosecution of a plan, and such promptitude in seizing an advantage or repairing an unexpected evil, as Sir George Smart."

In 1816 Sir George Smart was selected, as one of the most eminent musicians of the time, to take part in the conducting of the concerts of the Philharmonic Society, which had been insti-

tuted three years before for the performance of the works of the more celebrated modern masters. During his membership with this Society, Sir George Smart invariably evinced the spirit of a true *artiste;* for not only did he occupy the post of conductor at forty-nine concerts between the years 1816 and 1844, when he resigned his appointment, but he never hesitated to undertake a minor duty, if the perfection or success of a performance could thereby be heightened. Thus, when Haydn visited London in 1791, to produce the first six of those great master-pieces—his twelve Symphonies written to Salomon's order—he undertook on one occasion to beat the drums, and faithfully and diligently observed and carried out the great *maestro's* wishes and directions.

A few years previously to Sir George Smart's retirement from a share in the immediate direction of the Philharmonic Concerts, at which his services were always given gratuitously, he was presented by the wind instrument performers of the orchestra with an elegant *bâton*, upon which the names of the donors were engraved, as a mark of their high esteem and respect. He did not, however, cease to be a member of the Philharmonic Society on account of his retirement from his share in the musical direction. He and Mr. Charles Neate, the once eminent pianist, the friend of John Baptist Cramer, are the only persons now living who were amongst the original founders of the Society in 1813.

Whilst thus actively engaged as the conductor of oratorios and secular concerts, Sir George Smart still adhered to his attachment for the cathedral school in which he had been originally trained; and having been appointed in 1822 one of the organists, and in 1838 one of the composers, of the Chapel Royal, St. James's, he found time not only to fulfil the duties of the former position, but to add to the roll of classical productions which a long succession of eminent musicians, from the time of the Reformation, had provided for the services of the Church. Scarcely any of these compositions have hitherto been published, but it will be a gratification to the musical world to know that Sir George Smart is preparing, and has almost completed, an entire series of his Cathedral Services and Anthems, which have received her Majesty's permission to be dedicated to herself. He has also recently published a selection from his Glees.

In the discharge of his functions as one of the organists of the Chapel Royal, Sir George Smart presided at the organ at the

funeral of George IV.; at the coronation and funeral of William IV.; at the coronation and marriage of her Majesty; and at many other royal and public ceremonies of importance.

In 1834, it was determined to celebrate, in Westminster Abbey, the seventy-fifth anniversary of Handel's death, and on this occasion the entire musical arrangements were placed in Sir George Smart's hands. The successful issue to which he brought that great and arduous undertaking may be inferred from the testimony borne to the efficiency of the entire proceedings by the performers, who presented him with a costly and massive silver inkstand, bearing the following highly flattering, but no less well-merited inscription :—

"Presented to Sir GEORGE SMART by the vocal and instrumental performers engaged at the Royal Musical Festival held in Westminster Abbey, 1834, under the patronage of their Most Gracious Majesties King William IV. and Queen Adelaide, to mark their esteem for his character as a man, and his talent as a musician; also, as a token of their approbation of the able manner in which he conducted the performances."

The metropolitan reputation of Sir George Smart naturally ensured for him many provincial engagements, where his talents were as fully appreciated as his character was respected. In the course of his lengthened career, he conducted musical festivals and concerts in no less than twenty-three provincial cities and towns, viz. Bath, Bristol, Edinburgh, Reading, Liverpool, Manchester, Birmingham, Norwich, Newcastle-on-Tyne, Bury St. Edmund's, Dublin, Derby, Cambridge, Hull, Greenwich, Woolwich, Colchester, Brighton, Coventry, Cheltenham, Nottingham, Clifton, and Hereford. The most remarkable perhaps of all these provincial engagements was that which he undertook at Norwich in the autumn of 1824. So successful, indeed, was the well-remembered festival of that year, and so entirely was its musical efficiency attributable to Sir George Smart, that the Committee of Management voted him a gold snuff-box of the value of thirty guineas; whilst the Corporation—as that of Dublin had previously done—conferred the Freedom of the City upon him, "for the zeal, energy, and ability he had exerted."

In the year 1825, Sir George Smart was induced to pay a visit to Vienna, where he was most cordially received and welcomed by Beethoven, whose genius he was one of the first musicians of this country to acknowledge. His chief object in undertaking so long

and tedious a journey as was the transit from the English to the Austrian capital at that period, was to ascertain from Beethoven himself the *times* of his Sinfonias and other compositions, in order that they might be rendered in England according to his own express wish and determination. In this respect Sir George Smart was as greatly interested as he has always been in preserving and maintaining the traditions of Handel, which he himself received from Joah Bates, who had taken them immediately from Handel himself. As to the method which the great master of oratorio adopted in giving the accurate time of his various works according to his own will and purpose, and also as to the manner in which his songs were rendered by Madame Mara, Mrs. Billington, Mrs. Salmon, and Miss Stephens, by Harrison, Bartleman, Braham, and Vaughan, no one could have more accurate information than Sir George Smart himself. Not only was he taught by the friend whom Handel himself had directed, but he had heard all the older, and instructed most of the younger, of the above-named singers in the very method originally intended. It may be a source of congratulation to the musical world to learn that "those traditions" will not be lost, Sir George Smart having, with the utmost care and pains, prepared a work, which, it is to be hoped, may soon be published, in which each is in every particular preserved.

On returning from his visit to Beethoven at Vienna, Sir George Smart made the acquaintance of Mendelssohn at Berlin, and induced him to visit England; and it is not amongst the least of the honours which he has attained in the course of his eminent career, that he may be said to have introduced Mendelssohn's great specimen of pure oratorio composition, 'St. Paul,' to the English public, having himself conducted its first performance at Liverpool, in the autumn of 1836. Between Mendelssohn and Sir George Smart, esteem and affection were indeed as mutual as the same sentiments had been between Weber and himself. He was, indeed, the first amongst the musicians of his country to recognize the talents of the composer of 'Der Freischütz' as of the author of 'The Mount of Olives,' and to make them known by the introduction of the overture of the former work at those festivals and concerts which he conducted. The performance of the overture to 'Der Freischütz' speedily led to the production of one or more versions of the entire opera at several of the great

London theatres. Its success, although it was presented in a somewhat mutilated form, made the author so popular in England that nothing appeared to promise greater *éclat* than to engage him to compose, and bring him over to conduct, the music of another opera. For this purpose Sir George Smart proceeded to Germany in company with Mr. C. Kemble, the result being the engagement of Weber to write his last opera, and to support by his presence the reputation he had already gained in England. On reaching London, Weber became the inmate of Sir George Smart's house in Great Portland Street, and there he completed the entire score of 'Oberon,' the *libretto* of which was supplied by Mr. Planché. When this celebrated musician arrived in this country, in the month of March, 1826, he was in the last stage of consumption; he, however, brought out his opera, and continued to fulfil his public engagements and prosecute his private studies with the utmost assidnity and cheerfulness. He had even fixed to leave England on his return to Germany on the 7th of June; but on the morning of the 5th, he was found dead in his bed in Sir George Smart's house, which he had never left as a place of residence from the time of his arrival.

From the position Sir George Smart occupied as organist and composer of the Chapel Royal, and from the skill and tact he invariably manifested in the direction both of sacred and secular music, he obtained the patronage and encouragement of several members of the Royal Family, nearly all of whom, especially the Prince Regent, afterwards George IV., and the Duke of Sussex, were sound and accomplished musicians. So greatly, indeed, did he enjoy the confidence of the latter Royal Duke, that he was nominated by him to the office of organist of "The United Grand Lodge of Free and Accepted Masons," of whom he (the Duke of Sussex) was for many years the Grand Master. The wisdom of this appointment was apparent at all the great Masonic Festivals, since a rich musical treat was provided for the entertainment of the brethren of this ancient and mysterious Order, the compositions selected for illustration being always of so classical a character as to add quite as much to the charm as to the celebrity of those popular *réunions*.

Among the many professional pupils who have had the advantage of Sir George Smart's tuition, the following may be named as having obtained something more than a transient or ordinary

celebrity, viz. Miss Paton (now Mrs. Wood), Miss Louisa Pyne, the Misses Cawes, etc. etc., Messrs. T. Welsh, Henry Phillips, and Lockey, and more especially for sacred music and the traditions of Handel and the English masters, Mme. Sontag, Mme. Lind-Goldschmidt, Mme. Rudersdorff, and Signor Belletti.

Throughout a lengthened and an arduous career, Sir George Smart rose to eminence and estimation,—acknowledged quite as much upon the Continent as at home,—by his general acquaintance with the details of business, by gentlemanly manners, by skill in his profession, and by honour and integrity in its exercise, no less than by a liberality which was both generous and beneficial to those towards whom it was extended. To many an unfortunate and unsuccessful *artiste* he has afforded sympathy and aid, quite as much by his advice and counsel as by his purse. Beloved by his family, respected by his friends, his society has ever been eagerly sought by those who appreciate worth. He has attained a good old age, is still active and cheerful, and possessed of all his faculties, taking as deep an interest as ever in the progress of his art, and manifesting the same genial and versatile disposition which has endeared him to all who have had the privilege of his friendship and esteem.

ANTONIO PANIZZI.

In a work, the object of which is to illustrate Literature, Science, and Art, by the biographies of men eminent in the cultivation of those branches of human knowledge, some notice of the career of the Principal Officer of the British Museum ought to be found. Placed at the head of an Institution comprehending in itself the finest specimens of ancient art, the varied productions of nature, and one of the largest libraries in the world, he cannot but exercise an important influence over every channel of human thought.

Antonio Panizzi was born at Brescello, in the Duchy of Modena, on the 16th of September, 1797. Modena at that time formed a part of the Cisalpine Republic. After prosecuting his studies in the Lyceum at Reggio, where he remained until about seventeen years of age, he proceeded to the University of Parma. In 1818 he took his degree of Doctor of Laws, and then quitted the University and prepared himself for practice in the superior branches of the legal profession. Taking a deep interest in the political state of his native country, he, while yet a student, entered into the revolutionary movement which ultimately broke out in Naples in 1820, and in Piedmont in the following year. In this year his participation was made known to the Modenese authorities, through the weakness of one of the conspirators, and he judged it prudent to provide for his safety. He therefore quitted Brescello, and when at Cremona narrowly escaped seizure. A polite message was conveyed to him from the commissary of police, requesting his attendance, and it was from the office of this functionary that he saved himself by a hasty flight. The charge against him was tried in his absence, he was found guilty *per contumaciam*, and sentenced to death and the confiscation of

his property. He first sought a refuge in Lugano, the capital of the Swiss Canton of Ticino, but was obliged to quit it on the demand of Austria, and betook himself to Geneva. Here, however, he was not allowed to remain in peace. The representatives of Austria, France, and Sardinia, demanded the expulsion of himself and other Italian political refugees from the soil of Switzerland, who therefore determined to proceed to England. Being desirous of taking the route through France, but uncertain whether they would be allowed to do so, they sent forward one of their number (Mr. Aubrey Bezzi), as a pioneer. He was stopped at Gex, stripped, and nothing being found upon him, was ordered to return, whereupon they made their way by the Rhine and the Netherlands, and arrived in England in the month of May, 1823. Mr. Panizzi remained for some months in London, and then, on the recommendation of his friend Ugo Foscolo, he turned his steps towards Liverpool. He was received with more than friendly interest by Dr. Shepherd, the author of the life of Poggio Bracciolini, and by William Roscoe, the author of the Life of Leo X., to both of whom Foscolo introduced him, and by whom he was soon treated as a son. He spent here several years, maintaining himself by teaching his native language, and enjoying the best society of the place. In 1828, when the London University was founded under the auspices of Lord Brougham, Mr. Panizzi was invited by the noble lord to fill the chair of Italian Language and Literature, and after hesitating some time whether he should give up the agreeable society he was then enjoying for a new career, he accepted the proffered chair. In March, 1831, the post of extra-assistant keeper in the Department of Printed Books in the British Museum became vacant, and by the support and influence of Lord Brougham, who had by this time become Lord Chancellor, and other influential friends, Mr. Panizzi obtained the appointment. He was now in a situation in which he might indulge his taste for books, and soon distinguished himself by his energy and bibliographical acquirements.

The library of the British Museum was at this time in a very unsatisfactory state; although extensive, the deficiencies in every branch were large and important, and there was no regular annual grant by which these *lacunæ* could be filled up. In 1835 and 1836 a Committee of the House of Commons was appointed to inquire into the state of the Museum, and Mr. Panizzi was exa-

mined as a witness. In his evidence before the Committee he stated his views freely, and suggested many improvements which he has subsequently been enabled to carry out. He also visited the Continent, for the purpose of examining foreign libraries, and, with the view of aiding the inquiry, collected a vast mass of highly interesting and important particulars respecting them. In short, while some of the witnesses showed what the library had been and was, and explained why it could not at that time be better, Mr. Panizzi showed what it ought to be, and how it might be made so.

This inquiry led to great alterations in the system of management. It gave the first impulse to the changes which have subsequently taken place in the Institution, and opened the way to the great development it has subsequently undergone. It was felt that a young and vigorous man was wanted at the head of the Department of Printed Books, and when Mr. Baber, the then keeper, resigned his post in June, 1837, Mr. Panizzi was appointed to be his successor. He now found ample employment for all his strength and energy. The printed books were to be removed from Montague House to a new library, occupying the ground-floor of the north wing of the new building; the different catalogues of the collection under his charge, which had been drawn up at different times, and on various plans, were to be revised and reduced to one catalogue, compiled on one general plan, and additions were to be made to the library on a larger scale than heretofore. The service of the Reading-room underwent revision, with the double object of supplying books more readily to the readers, and increasing the safeguards of the collection. To suggest, organize, and superintend at this period, involved a vast amount of labour. He was anxious that the National Library should be worthy of the nation, and keeping this object constantly before him, he endeavoured to make every step tend towards this point. In 1845 he laid before the Trustees a report, showing the great deficiencies in the library. This report having been approved by the Trustees, was submitted to the Lords of the Treasury in December of the same year, and ordered to be printed by the House of Commons, 27th March, 1846. This led to the grant of the sum of £10,000 annually for the purchase of printed books, until the deficiencies were filled up. At the expiration of two years, however, the state of the public finances rendered it advisable to

reduce this grant, and indeed had this cause not arisen, the limited space in the library for new acquisition would have rendered such a step necessary.

Mr. Panizzi's exertions were not always sweetened by the approval of those in whose behalf they were made. The question of the revisal and re-adjustment of the catalogue led to much discussion. Some wished things to remain as they were; some objected to the plan upon which it was determined that the new catalogue should be drawn up; some, again, objected because they could not get books which did not exist; and those who knew nothing about the matter were the greatest objectors of all. It was natural that this state of things should result in something, and they did result in a commission to inquire into the constitution and management of the British Museum, which held its first sitting on the 10th of July, 1847. Mr. Panizzi took this opportunity to challenge all who disapproved in any way of the manner in which he administered the affairs of the department under his charge, to come forward and state their objections before the Commissioners. This challenge was very extensively accepted, and Mr. Panizzi was thus enabled to explain his motives and justify his proceedings to the full satisfaction of the Commissioners, while under an examination which lasted eighteen days. The report of the Commissioners is the best comment upon these attacks. They say:—"We have had occasion, in the course of our inquiry, to ascertain the prevalence, among many persons, of an impression which attributes to that gentleman (Mr. Panizzi) not only the adoption of a plan for a catalogue, of which those parties, on various grounds presently to be noticed, disapprove, but also the delay of which they complain in the execution of the plan so adopted. It becomes our incidental duty to do him justice in these particulars. From what we have already stated, it will appear that, with respect to the system and form of the catalogue, whatever be its defects, Mr. Panizzi can be charged with nothing further than the constant approval and acceptance of one leading principle, that of fulness and accuracy, suggested on high authority, adopted by an able superior and predecessor in office, indicated by the statutes of the Museum, and enforced by the deliberate sanction of the Trustees and the recommendations of a Parliamentary Committee." Again:—"Whatever be the judgment formed on the points at issue, the pages in question (*i. e.* Mr. Panizzi's evidence) contain

frequent proofs of the acquirements and abilities, the manifestation of which in subordinate office led to Mr. Panizzi's promotion to that which he now holds, under circumstances which, in our opinion, formed on documentary evidence, did credit to the principal Trustees of the day."

It is unnecessary to multiply extracts. It will suffice to say that Mr. Panizzi satisfied not only the Commissioners, but the public, for no more complaints have been heard from that time.

The want of space for the collection was an evil which became more and more serious, and after various schemes had been proposed and rejected, a plan, submitted by Mr. Panizzi, was adopted by the Trustees. This plan comprehended the erection of a new Reading Room, with surrounding library, in the inner quadrangle of the Museum. It was laid before the Trustees on the 5th of May, 1852, and after full investigation and discussion, was adopted, and the excavations were commenced in the month of May, 1854. The first brick was laid in the September of the same year; the first iron standard was fixed in the month of January, 1855; and in the month of May, 1857, the structure was completed. This building is 258 feet long by 184 in width, and covers an area of 47,472 square feet. The construction is quite novel; it may not, therefore, be uninteresting to give some details respecting it. The Reading Room is circular. The dome is 140 feet in diameter, and its height 106 feet. The diameter of the lantern is 40 feet. In its diameter the dome of the Reading Room exceeds all others, with the exception of the Pantheon of Rome, which is about two feet wider. The surrounding libraries are 24 feet in height, with the exception of that part which runs round the outside of the Reading Room, which is 32 feet high, the spring of the dome being 24 feet from the floor of the Reading Room, and the ground excavated 8 feet below this level. The new Reading Room contains 1,250,000 cubic feet of space, and the surrounding libraries 750,000. Upwards of 2000 tons of iron have been employed in the construction of the Reading Room and the surrounding libraries. The weight of the materials used in the dome is about 4200 tons, or upwards of 200 tons on each of the 20 iron piers by which the dome is supported. The quantity of glass used amounts to about 60,000 superficial feet.

The Reading Room will accommodate 302 readers, each of whom has allotted to him a space of at least 4 feet 3 inches in

length, by 2 feet 1 inch in depth. He is screened from the opposite occupant by a longitudinal division, which is fitted with a hinged desk, graduated on sloping racks, and a folding shelf for spare books. The framework of each table is of iron, forming air-distributing channels. A tubular footrail also passes from end to end of each table, which may have a current of warm air through it at pleasure, and be used as a foot-warmer if required.

The arrangement of the presses is peculiar throughout the new libraries. The shelves within the Reading Room contain about 60,000 volumes of more than average size; the new building altogether will accommodate about 1,300,000 volumes. The standards of the bookcases are formed of malleable iron, galvanized and framed together, having fillets of beech inserted between the iron to receive the brass pins upon which the shelves rest. The framework of the bookcases forms the support for the iron perforated floors of the gallery avenues, which are generally 8 feet wide.

The shelves are formed of iron galvanized plates, edged with wainscot, and covered with russet-hide leather. The shelves rest upon brass pins, the holes for which are pierced at $\frac{3}{4}$ of an inch apart from centre to centre; but by a contrivance in cranking the shaft of the pin, which may be turned upwards or downwards, this interval may be halved, and the position of the shelves may be altered $\frac{3}{8}$ of an inch at a time. There are 2,750,000 of these holes. The building contains 3 miles lineal of bookcases 8 feet high; assuming them all to be spaced for the size of the average octavo volume, the entire ranges form 25 miles of shelves.

The inner surface of the dome is divided into 20 compartments by the moulded ribs, which are gilded with leaf prepared from unalloyed gold, the suffites being in ornamental patterns, and the edges touching the adjoining margins fringed with a leaf-pattern scalloped edge. Each compartment contains a window (having double sashes), with hot-water pipes between them, with three panels above, the central one being medallion-shaped; the whole bordered with gilt moulding and lines, and the field of the panels finished in encaustic azure blue, the surrounding margin being of a warm cream-colour. The details of the windows are treated in like manner. The moulded rim of the lantern light is painted and gilded to correspond. The sash is formed of gilt moulded ribs radiating from a central medallion, in which a monogram, formed of the letters V. A., is alternated with the imperial crown. The

cornice from which the dome springs is massive and almost wholly gilded. Each compartment of the dome is marked by a bold enriched gilt console, which forms at once the support of the main rib and the base for a colossal marble statue, a series of which, it was proposed in Mr. Panizzi's plan, should be placed on the cornice.

The above description may enable the reader to form some idea of the result of Mr. Panizzi's plan. A more perfect success could hardly have been anticipated or desired, and the constant applications for admission, both for the purposes of study and to view the building, show that both the reading and sight-seeing public have fully appreciated the boon conferred upon them. The bust of Mr. Panizzi, executed by Marochetti, and placed over the door of the Reading Room, in the passage from the entrance-hall, was a very pleasing memorial from the department of Printed Books. This bust was paid for by subscription from every person in that department, no others being allowed to contribute.

In the month of February, 1856, Sir Henry Ellis retired from the service of the Trustees, and Mr. Panizzi was appointed to succeed him as principal librarian (or, in other words, as the chief officer or administrator of the whole Museum) on the 6th of March following, being about a month before the completion of the new reading-room and libraries.

The same energy and ability which marked his career as keeper of the printed books have not deserted him as principal librarian. Many subjects out of the ordinary routine of his duties have demanded his attention, of which the most important is the question of space for the constantly-growing collections. One of the early fruits of the construction of the new reading-room and library was the regranting the annual sum of £10,000 to the department of printed books, and which has been continued for the last seven years. But the other departments remained as much inconvenienced by want of room as before. Mr. Panizzi, in his evidence before the Committee of the House of Commons in 1835-36, expressed his opinion that it would be for the advantage of the Museum and of natural history that the collections then under the roof of Montague House should be separated, and the portion relating to natural history be removed elsewhere. This opinion he has always conscientiously maintained, and repeatedly urged; and a plan which he drew, embracing alterations and additions to the present

Museum building, to adapt it for the collections of art and literature after the removal of those relating to natural history, has been generally approved by the Trustees and the Governors. The principle of separation has thus been adopted by a majority of the Trustees and by the Government, but the sanction of the House of Commons has not yet been given to it. It depends upon this decision whether the study of natural history is to be worthily promoted in this country, or to be cramped and checked by retaining the collections which are necessary for its development as an inferior portion of the great national Museum, where there is no room for them, instead of giving them a capacious home of their own.

Mr. Panizzi has been so much occupied in providing literary materials for others that he has had little leisure for literary labours himself. His works, however, are :—1. An Elementary Italian Grammar, 12mo, London, 1828. 2. Extracts from Italian Prose Writers, 12mo, London, 1828. 3. Orlando Furioso di Bojardo, Orlando Furioso di Ariosto, with an Essay on the Romantic Narrative-Poetry of the Italians; Memoirs and Notes; 9 vols. 8vo, London, 1830–34. 4. Sonetti e Canzoni di Bojardo, edited with notes, 4to, London, 1835; printed for private circulation. 5. On the Supply of Printed Books from the Library to the Reading Room, 8vo, London, 1846; printed for private circulation. 6. A short Guide to that portion of the printed books [in the British Museum] now open to the public, 12mo, London, 1851. 7. Chi era Francesco da Bologna? 16mo, London, 1858; an Essay to prove that Francesco da Bologna, the artist who cut the types for Aldus, was the celebrated painter Francia; printed for private circulation. 8. Le prime quattro edizioni della Divina Commedia; letteralmente ristampate per cura di G. G. Warren, Lord Vernon; edited by A. Panizzi; folio, London, 1858. Mr. Panizzi has also contributed articles to the 'Quarterly,' 'Edinburgh,' and 'North British' Reviews.

It is known to the writer of this memoir that about two years ago the honour of knighthood was offered to Mr. Panizzi, in recognition of his public services, but was by him respectfully declined. The honorary degree of D.C.L. was conferred upon him by the University of Oxford.

JOHN TYNDALL, F.R.S., ETC.,

PROFESSOR OF NATURAL PHILOSOPHY IN THE ROYAL INSTITUTION AND IN THE ROYAL SCHOOL OF MINES.

About the middle of the seventeenth century, some members of one of the English families of the name of Tyndall or Tyndale emigrated to Ireland, on the eastern or Saxon fringe of which island a few of their descendants are still scattered. Their fortunes, as to social position, have been various; but probably to no member of the family fell a more lowly lot in life than to John Tyndall, the Professor's father, though few of them, perhaps, merited a higher. He was a man of personal courage, intellectual power, and delicacy of mind and feeling. From his forefathers he inherited a taste for religious controversy, as far as this related to the Churches of Rome and England, and thus the earliest intellectual discipline of his son consisted in exercises on the doctrines of Infallibility, Purgatory, Transubstantiation, and the Invocation of Saints. The works of Tyndale, Chillingworth, Tillotson, Faber, Poole, and others, constituted, in fact, the first text-books of the future natural philosopher. By the silent operation of his character—by example as well as by precept—this remarkable man inspired the intellect of his boy, and taught him to love, above all things, a life of manly independence. He died in May, 1847, quoting to his son a little before he died the words of Wolsey to Cromwell, "Be just, and fear nothing."

Professor Tyndall's earliest education was received at a school in the neighbourhood of Leighlin Bridge, in which village he was born about 1820. Mr. John Conwill, one of his tutors, appears to have possessed considerable mathematical knowledge, and to have been the first to impart to his pupil a decided taste for pure

geometry. In the year 1839 Mr. Tyndall quitted school, to join, in the capacity of "civil assistant," a division of the Ordnance Survey, which was stationed in his native town, under the command of Lieutenant George Wynne, now Colonel Wynne, Commanding Engineer at Corfu. He joined the Survey with the determination to make himself master of all its details, and, thanks to the excellent officer and true gentleman under whose superintendence he found himself, he was enabled to carry out his resolution. He quickly acquired a practical knowledge of every branch of the Survey; he became in turn a draughtsman, a computer, a surveyor, and a trigonometrical observer; and in subsequent years turned his experience to account in his investigations on Alpine Glaciers.

A simple circumstance which occurred to Mr. Tyndall in 1841, when he was stationed in Cork, and which, as he has often related to us, formed a kind of turning-point in his career, ought here to be noted. At that time he worked, at mapping, in the same room with Mr. Lawrence Ivers, a pupil of Lovell Edgeworth, of Edgeworthstown, and a very able man. Ivers was looked up to with great respect by his younger colleagues, the most of whom, like himself, were Catholics. Various circumstances connected with young Tyndall's work and conduct were noted by Mr. Ivers; and one day, while walking with his young friend across the barrack-square of Cork, he asked him how his leisure hours were employed. The answer not being quite satisfactory to him, he rejoined, "You have five hours a day at your disposal, and this time ought to be devoted to systematic study. Had I," he continued, "when I was your age, had a friend to advise me as I now advise you, instead of being in my present subordinate position, I should be the equal of Colby.* Next morning, Tyndall was at his books before five o'clock, and for twelve years never swerved from the practice.

In 1844, seeing no definite prospect before him, Mr. Tyndall resolved to go to America, whither, in the early part of the present century, some members of his father's family had emigrated.†

* Colonel Colby was then Director of the Ordnance Survey.

† One of these is at the present moment a distinguished officer in the Federal army. This is the Hector Tyndale who, some years ago, to use the words of Mr. Wendell Phillips, went down to Harper's Ferry with his life in his right hand to receive the dead body of John Brown, and deliver it over to his widow. We may add, too, that by a curious coincidence, Major Tyndale

The intention, however, was opposed by many of his friends, and by none so strenuously as by Richard Boyle Bernard, Dean of Leighlin, a descendant of Robert Boyle, the natural philosopher. The extraordinary development of our railway system occurred at this juncture, and happily kept Mr. Tyndall at home. In 1844 he was engaged by a firm in Manchester, and in the autumn of that year was occupied with engineering operations in the pleasant valleys of the Churnet and the Dove, as well as on the banks of the Great Ouse, in Bedfordshire. In 1845 he removed to Halifax, in Yorkshire, where he remained throughout the exciting period of the "Railway Mania," taking his full share in the terrible toils which that period involved. In the same office was an articled pupil, Mr. Hirst, whose subsequent life was determined wholly by the example and influence of his truest friend.

Thus nearly five years of Mr. Tyndall's life were spent on the Ordnance Survey, and about three years more were connected with railways. Extreme caution and accuracy, together with dauntless perseverance under difficulties, characterized then, as now, the performance of every piece of work he took in hand. Habitually indeed he pushed verification beyond the limits of all ordinary prudence, and on returning from a hard day's work, he has been known to retrace his steps for miles, in order to assure himself of the security of some "bench-mark," upon whose permanence the accuracy of his levels depended. Previous to one of those unpostponable thirtieths of November, when all railway plans and sections had to be deposited at the Board of Works, a series of levels had to be completed near Keithly, in Yorkshire, and Manchester reached before midnight. The day was stormy beyond description; levelling staves snapped in twain before the violent gusts of wind; and level and leveller were in constant peril of being overturned by the force of the hurricane. Assistants grumbled "impossible," and were only shamed into submissive persistence by that stern resolution, which, before night-fall, triumphed over all obstacles.

In 1847, finding his railway-work unpromising, and still ani-

afterwards held possession of, and commanded at, Harper's Ferry. At Antietam nearly half his men were cut to pieces; he himself was carried, apparently dead, from the battle-field, and for his gallant behaviour on the occasion was made Brigadier-General.

mated by an irrepressible desire to augment his knowledge, Mr. Tyndall resigned his situation at Halifax, and changed his profession. He accepted an appointment as teacher at Queenwood College, in Hampshire,—a new institution, devoted partly to a junior school, and partly to the preliminary technical education of agriculturists and engineers. It was surrounded by 800 acres of land, upon which, besides farming, surveying, levelling, and other engineering operations were to be practically taught. As might be anticipated in a college thus constituted, cases of insubordination, especially amongst the older students, not unfrequently occurred. In such cases Mr. Tyndall, though inexperienced as a teacher, was invariably called upon to restore order. In doing so he did not trust to the harsh expedients behind which scholastic incompetence too frequently seeks refuge, but to the pure force of character. The ringleaders quailed before the "potential energy" stored up in their young tutor, convinced, doubtless, that this energy, once rendered "active," would be more than sufficient to crush the most formidable resistance they were prepared to oppose.

An able resident chemist was also attached to the college, and in his laboratory Mr. Tyndall hoped to be able to turn his spare time to account. During part of his residence at Queenwood he renounced a portion of his small income, in order to secure additional time for the pursuit of his studies; but he soon longed for better opportunities than he could there command, and ultimately satisfied his longing in the following way:—The chemist just referred to was Mr., now Professor, Frankland, the well-known colleague of Professor Tyndall at the Royal Institution. In 1848 they quitted England together, and repaired to the University of Marburg, in Hesse Cassel. They were drawn thither by the fame of Professor Bunsen as a teacher, and to this eminent man Professor Tyndall owes the final determination of his career. Bunsen was celebrated not only as a chemist, but as a highly accomplished natural philosopher. Mr. Tyndall attended his lectures, and worked practically in his laboratory. The stores of the great master's intellect, and the resources of his cabinets, were alike freely opened to the student, who was requested, in fact, to regard what the laboratory of Marburg contained as his own, and to make corresponding use of it. He worked hard, more through a sense of duty than through the hope of external recognition. Mr. Tyndall

has often gratefully mentioned to us the influence of Thomas Carlyle on this portion of his life.

In Marburg, he also attended the physical lectures of Professor Gerling, now dead, and of Professor Knoblauch, now of Halle, and likewise worked practically in their physical cabinets. He attended, too, the mathematical lectures of Professor Stegmann, and had also the advantage of private instruction from this excellent teacher. His first scientific paper was a mathematical essay on "Screw Surfaces," which formed the subject of his inaugural dissertation when he took his degree. But the investigation which first made him known to the scientific world was one "On the Magneto-Optic Properties of Crystals, and the Relation of Magnetism and Diamagnetism to Molecular Arrangement," which investigation, executed in connection with Professor Knoblauch, was published in the 'Philosophical Magazine' for 1850.

In 1851 Mr. Tyndall went to Berlin, and continued his researches on the newly-discovered force of diamagnetism and on the magnetic properties of crystals, in the laboratory of Professor Magnus. The apparatus of this distinguished physicist was placed generously at his disposal, while kindness, courtesy, and hospitality ever awaited him in the Professor's house. After making the acquaintance and securing the friendship of many eminent men in Berlin, Mr. Tyndall returned to London, where, during the same year, he first became personally known to Professor Faraday. It was about this time, too, that General Sabine, struck by the originality of his investigations, wrote to Mr. Tyndall, and offered to prepare the way towards his election as Fellow of the Royal Society; the election itself followed in 1852. Dr. Bence Jones, who first heard in Berlin of the existence of Mr. Tyndall, invited him, shortly afterwards, to give a Friday-evening discourse at the Royal Institution. The invitation was accepted, and the lecture, given on February 14th, 1853, was so successful that offers from various institutions immediately poured in upon the lecturer. His appointment in the Royal Institution was strongly urged by Dr. Bence Jones, and was also recommended by Mr. Faraday. The antecedents of this renowned institution, and the thought of being closely connected with that grand and simple soul whose labours alone would have immortalized any institution, at once decided Mr. Tyndall's choice; accordingly, he was unanimously elected, in June, 1853, to the appointment which he now holds, of Professor of Natural Philosophy.

The first three years of Mr. Tyndall's residence in London were devoted to an exhaustive investigation of diamagnetic polarity, and the general phenomena of the diamagnetic force,—magne-crystallic action included. In the Philosophical Transactions and Philosophical Magazine he published various memoirs on these subjects, all of which were received with considerable favour by the scientific world.

Very striking features of Mr. Tyndall's character are illustrated by his excursions in Switzerland, which country he first visited in 1849, for the sole objects of healthful relaxation and exercise. It was in 1856, and in the company of his friend Professor Huxley, that he first visited the Alps with an express scientific object,—the application of certain views regarding the cleavage of slate-rocks to the structure of glacier-ice. On their return, the two friends published joint papers on the structure and motion of glaciers. In 1857, Mr. Tyndall spent nearly six weeks at the Montanvert, and, assisted by his friend Mr. Hirst, made a complete investigation of the Mer de Glace and its tributaries. This investigation necessitated many perilous expeditions, all of which are described with remarkable vigour in the narrative-portion of Mr. Tyndall's work 'On the Glaciers of the Alps,' which was published in 1860. Towards the close of their six weeks' invigorating and instructive labours, the two friends, accompanied by a single guide, made their first ascent of Mont Blanc. After leaving the Grands Mulets, up to which point they were accompanied by Professor Huxley, the little party went astray; and it was only at the expiration of seventeen hours of excessively exhausting toil that they succeeded in reaching the summit, and regaining the ice-bound rock upon which their anxious friend had meanwhile been imprisoned. The year 1857 was devoted to the detailed investigation of a single glacier; but in 1858, wishing to render his knowledge more varied and general, Mr. Tyndall visited almost all the great glaciers of the Alps. This year he ascended the Finsteraarhorn with a single guide, and Monte Rosa, first with a single guide, and secondly alone. It was on the latter occasion that he was so nearly isolated from the world below, by the slipping away from him of his ice-axe.* The same year he made a second ascent of Mont Blanc, and in 1859 he again visited Chamouni, and spent, in company

* 'Glaciers of the Alps,' p. 157.

with Professor Frankland, a whole night upon the summit of the mountain, with a view to scientific observations. On Christmas night of this same year, we find him, hip-deep in snow, again at Chamouni; his object now being to make himself acquainted with the winter aspects and phenomena of glaciers. With great labour he succeeded in attaining his old quarters at the Montanvert, where he spent two days and two nights, and, before returning, determined accurately the winter motion of the glacier.

The scientific part of his 'Glaciers of the Alps' contains a full and lucid exposition of the origin and phenomena of glaciers. More complete investigations of isolated and contested points, relative to the structure and motion of glaciers and to the physical properties of ice, were published by Mr. Tyndall in the Philosophical Transactions of these years.

What he did in the way of climbing in the year 1860, in company with Mr. Vaughan Hawkins, is described by Mr. Hawkins and himself in 'Vacation Tourists' for that year; and in a letter to the 'Times' of 8th September, 1860, will be found a description of his visit to the scene of the well-remembered disaster on the Col du Géant. In 1861, he succeeded in reaching the hitherto untrodden summit of the Weisshorn, believed by competent judges to be the noblest mountain of the Alps. An account of his tour of that year is given in his extremely interesting and poetically thoughtful little book entitled 'Mountaineering in 1861.' In 1862 he made a second attack on the famous Matterhorn, the first being made, in the company of Mr. Hawkins, in 1860. This great obelisk is 14,800 feet high, and Mr. Tyndall and his guide reached a height of 14,600. Here, however, they were obliged to halt in presence of appalling precipices. In 1863 his climbing was limited to an ascent of the Jungfrau.

Mr. Tyndall's scientific researches have been numerous and varied, but his most important investigations are those which he has executed during the last five years, and the one in which he is now engaged. In his recent researches he devotes himself to the investigation of the molecular condition of matter; the grand problem to the solution of which Mr. Tyndall's inquiries have been hitherto mainly directed. He, for the most part, uses matter in its free condition as a gas or vapour, while *radiant heat* is the instrument he applies to its examination. Five memoirs on this most important subject have been already completed; three of

them are already published in the Philosophical Transactions, another is reported for publication, and the fifth, we understand, will be shortly handed in to the Royal Society.

The foregoing sketch, from the pen of one who knew him before he was known to the world, is but a meagre outline of Mr. Tyndall's eventful life.

THOMAS WOOLNER.

Thomas Woolner, one of the most eminent of sculptors who have not yet obtained Academical honours, was born at Hadleigh, in Suffolk, in December, 1825. Educated in the school of that town, he was remarkable as a boy for that close and devoted observance of nature which has proved one of the leading characteristics of his works. By the age of thirteen, indications of a talent for sculpture were manifested, and he was placed in the studio of Mr. Behnes. Here Thomas Woolner studied with great industry for six years; and those who are familiar with the works of that distinguished sculptor, will not fail to discover in the works of his pupil how much he profited by his apprenticeship, especially in mastery over human form and in the power of expressing character. Mr. Behnes's abilities as a draughtsman were extraordinary, and he exercised his pupil in this essential branch of the art until he reached an almost similar point of accuracy. Like all young artists, Thomas Woolner designed many subjects that were not fated to advance beyond paper. These were chiefly of a poetical and historical character, and to this style belonged the first models which he produced:—'Eleanor sucking the poison from Prince Edward's wound,' exhibited in 1843; and a life-size group, 'The Death of Boadicea,' exhibited at Westminster Hall. Much attention was, we believe, excited by the Boadicea as a work of promise in the inventive, or, as it is also called, ideal style, in which English sculptors had been somewhat deficient. Figures of Puck, and of Titania with her Indian Boy, exhibited soon after at the British Institution, and an Eros and Euphrosyne, exhibited at the Royal Academy, strengthened the impression which the Boadicea had produced; and when, in 1854, Mr. Wool-

ner exhibited a marble statuette of 'Love,' he was considered by many to have taken a place among the number of poetical sculptors of whom Flaxman is the acknowledged chief.

Mr. Woolner, like many other sculptors of poetical aspiration, had, however, to turn his attention to portraiture. For the pursuit of this, Australia, to which place he went for two years in 1854, offered a wide patronage, and in Sydney and Melbourne he executed a number of likenesses, mainly in low relief. Mr. Wentworth and Sir Charles Nicholson, of Sydney, with Sir Charles Fitzroy and Mr. Latrobe, the Governors of New South Wales and of Victoria, were modelled by Mr. Woolner in medallion; in which style he has subsequently produced characteristic likenesses, amongst others, of Mr. Alfred Tennyson, Mr. Robert Browning, Sir Francis Palgrave, and Mr. Thomas Carlyle. On his return from Australia, Mr. Woolner's first important production was a life-size statue of Lord Bacon for the new museum at Oxford. In this statue, whilst the features and drapery have been as literally reproduced as the material allows, the conception of the figure, including the attitude and expression, is governed by a nice artistic feeling of the character and dignity of the subject. Mr. Woolner has also executed several busts of reputed excellence, among which may be mentioned those of Alfred Tennyson and Professor Sedgwick, in the Library of Trinity College, Cambridge; the latter of which, together with busts of similar quality of Wordsworth, Rajah Brooke, Mr. Maurice, and others, were shown in the International Exhibition. Posthumous busts, of great merit, of Professor Henslow, Archdeacon Hare, and Mr. Arthur H. Clough, are also due to Mr. Woolner's chisel, and he has in hand a likeness of Mr. Gladstone. Among works of eminence of an imaginative kind may be specially mentioned a group of two deaf and dumb children, in the International Exhibition, the sister supporting her younger brother, being full of truthful variety and poetic feeling. The artist has a group of somewhat similar character, a Mother teaching her Child his prayers, in hand for Sir Walter Trevelyan.

Mr. Woolner has also taken his share in that more strictly architectural sculpture which the revival of the Gothic style in England has introduced amongst us. He modelled, some years ago, four very characteristic figures, in relief, of Prophets and Apostles for Llandaff Cathedral, and a large series of statues have been commissioned from him for the new Assize Courts of Manchester,

including lawgivers, as Moses, Alfred, Edward I., and personifications of Justice, Mercy, and other similar subjects.

Of monumental works of importance which have not yet left Mr. Woolner's studio, we may mention the following:—a standing figure of Prince Albert, for Oxford; a bronze of Mr. Godley, the founder of Canterbury, New Zealand, destined for that settlement; a marble figure of Lord Macaulay, seated, for Trinity College, Cambridge; and a statue of William III. for the new Houses of Parliament.

We have spoken of Mr. Woolner as being essentially a poetical sculptor; we may now refer to the labours of his Muse as a poetical *littérateur*. About fourteen years ago he published some fragments of poetry in an obscure periodical, and these have been lately amplified into a volume of 170 pages, having for its title 'My Beautiful Lady.' Though published only in the autumn of last year, 'My Beautiful Lady' has already reached a second edition. The poem is thus characterized by an eminent critic:*—"Mr. Woolner is, we believe, widely known as one of the very few first-rate sculptors of the day; his workmanship in marble shows uncommon truth, power, and directness of aim; and it is hence natural that similar qualities should be manifested in his poetry. 'My Beautiful Lady' has abundant warmth of colouring, and many landscape details touched with vivid power; but, as a whole, we should decidedly call it a statuesque poem. It has the unity which sculpture pre-eminently aims at. It is true that poetry of any high class is in itself an art, and one hardly less arduous in its requirements than sculpture. Finished verse is as much matter of sheer practice and study as finished painting. The poet must not only 'be born,' but, if we may hazard the phrase, be born again, through his own strenuous devotion to truth and music and beauty. It is not probable that the author has, in the case before us, been able to consecrate equal leisure to both arts; and his 'Beautiful Lady,' by some of those turns which show want of facility, may be ranked in that order of which English literature affords several remarkable specimens,—poetry, namely, written by men who, though not professionally poets, have manifested their possession of 'the vision and faculty divine' by signs unmistakable. Mr. Woolner's management of his lyrical metres, to which he has appropriately assigned the passionate portions of the drama, is peculiar. They

* 'Saturday Review,' Nov. 7, 1863.

move with an even, thoughtful pace, in harmony with the earnest purpose of the whole poem; but, to our ear at least, they are overloaded with consonants, although carefully composed, and exhibiting unusual inventiveness in their rhythmical combinations. It is curious that this comparative want of ease and flow in the rhymed stanzas should be accompanied by a truly skilful and harmonious construction of what has ordinarily been the severest *crux* to English poets—the unrhymed ten-syllable verse. In this respect the narrative portions appear to us not inferior to Wordsworth in his best moments. The language is throughout terse and animated; no words have been thrown away; and here and there we find an abruptness and straightforward quality about the phraseology, not free from obscurity at first sight, which—though familiar enough to the readers of Pindar and Dante—is likely to shock the lovers of conventionality."

A single stanza, taken at random, will suffice as a specimen :—

> "When crowding evils war to shake my faith
> In righteousness, for thinking of Her life,
> Made up of gracious acts and sweet regards,
> Compassionately tender; and enshrined
> In such a form, that oft to my fond eyes
> She seemed divine, and I could scarce withhold
> My wonder, Heaven could spare Her to a world
> So stained as ours. And now, whatever come
> Of wrong and bitterness to break my strength;
> Whatever darkness fate may plunge me in;
> A ray has pierced me from the highest heaven—
> I have believed in worth, and do believe."

SAMUEL WARREN, Q.C., D.C.L., F.R.S.

SAMUEL WARREN, jurist, moralist, novelist, eldest son of the late Rev. Samuel Warren, LL.D., Rector of All Souls', Ancoats, Manchester, was born at Racre, Gresford, Denbighshire, on the 23rd of May, 1807. We learn from a note appended to his tale 'The Bracelets,' in a People's Edition of his writings published some ten years since, that this, nearly his first contribution to literature, which appeared in the January number of 'Blackwood's Magazine' for 1832, was composed "when the author was of very youthful age." And in the preface to that series of collected works, when the writer's established fame allowed him to speak of other circumstances in connection with his early productions, we are told that at the age of seventeen he had nearly completed, in secret, a work for the press, and wrote a letter to Sir Walter Scott to ask him how to set about publishing it. The answer of the then Unknown, dated, "Abbotsford, Aug. 3rd, 1823," is a curious record of the persistency with which he still laboured to preserve his *incognito*. "I am not the author," he said in his reply to the youthful aspirant, "of those novels which the world chooses to ascribe to me, and am therefore unworthy of the praises due to that individual, whoever he may prove to be. It is needless, therefore, to add that I cannot be useful to you in the way you propose. Indeed, if you will take my advice, you will seek no other person's judgment or countenance on the project of publishing which you entertain, than that of an intelligent bookseller who is in a good line in the trade."

At the close of 1827 we find Samuel Warren a student in the mathematical class of the University of Edinburgh, having already gained amongst other prizes that for English Verse in the Senior

Humanity Class, for his poem of 250 lines, 'The Martyr Patriots.' The fervour with which he admired the rough exterior and majestic form of Professor Wilson, when informed that he had concurred with Professor Pillans in awarding him the prize, may be readily imagined. "I never saw any man," said Mr. Warren in 'A Few Personal Recollections of Christopher North,' contributed some years ago to 'Blackwood's Magazine,' "who *looked* the man of genius he was, but Professor Wilson. Next to him was Sir Walter Scott."

Mr. Warren commenced to study medicine, and his literary taste developed itself from time to time during the next few years, from 1830 to 1836, in that remarkable series of papers in 'Blackwood's Magazine' entitled 'Passages from the Diary of a Late Physician.' On being reprinted in a separate form, the author gave his name in the title-page of the third volume. The emotions are excited in these fearful narratives—some of which are said to have been taken from actual life—to the highest degree, and the work has been largely read. "It has had a great circulation," says Mr. Warren in his preface to the latest edition, "both in the Old and New World, and passed into various languages, the last of which the author heard, being the *Bömisch*, or Bohemian." His famous novel of 'Ten Thousand a Year' followed, in which the author wrote "with a pen dipped freely and deeply into satire, but with no other object than to discriminate between virtue and vice, between sincerity and hypocrisy." Mr. Warren appears to have soon given up the study of medicine for the law, for having practised as a Pleader since 1831, in 1837 he was called to the Bar, and in the following year a paper made its appearance in 'Blackwood' with the title 'My First Circuit: Law and Facts from the North, in a Letter to Christopher North,' "given from my chambers on the 8th floor of No. 37, Fig-Tree Court in the Temple, on the 10th day of this present June, 1838." About this time appeared also some fugitive papers, among which may be mentioned 'Pegsworth, a Press-room Sketch,' and 'Calais; my Adventures, Pleasures, and Embarrassments,—thither, there, and back.'

From this period Mr. Warren's writings partook in great measure of a juridical cast. His mind, however, being still imbued with the fancy of the novelist and essayist, his contributions to the literature of the law had the merit of attracting and interest-

ing many more readers than is usual with such treatises. In 1835 appeared 'A Popular and Practical Introduction to Law Studies,' which, from a small duodecimo, became amplified, in the course of ten years, into two octavo volumes of sixteen hundred pages, published in July, 1863, with the comprehensive title—'A Popular and Practical Introduction to Law Studies, and to every Department of the Legal Profession.' A writer in the 'Quarterly Review' (July, 1836), taking the first edition of this manual as a theme for an article on Law Studies, introduced Mr. Warren's work with the following characteristic remarks:—"We have been drawn into these general observations upon the legal profession by the perusal of what proved to be a very entertaining book under a very unattractive title. This work, we frankly admit, had been lying before us, unopened, for some time, the title-page seeming to mark it out as scarcely within the limits of our critical jurisdiction: what had we to do with the pupillary state of counsel learned in the law? But being casually informed that the volume proceeded from a pen heretofore advantageously exercised on subjects of a far different description, we opened it, and found ourselves carried forward by a free, animated, and often picturesque style, till we had perused nearly the whole. The book is written with that utter frankness of disposition, and with some portion of that quaintness which is supposed to distinguish our older writers. There is a spice of Montaigne in its composition."

In 1852 Mr. Warren published, in two volumes, an elaborate treatise on 'Election Law,' which has ever since maintained its position as a standard work on that important subject. Four years previously, namely in 1848, contemporaneously with a treatise on 'The Moral, Social, and Professional Duties of Attornies,' had appeared his third and last novel, 'Now and Then.' Though described by a critic in the 'Times' as "a vindication in beautiful prose of the ways of God to man," followed by the reflection that "a grander moral is not to be found than that which dwells upon the reader's mind when the book is closed, conveyed, as it is, in language as masculine and eloquent as any the English tongue can furnish;" it was deemed inferior in interest, and was much less popular with the general reader than the author's previous novels. In 1851 Mr. Warren published a pamphlet which attracted considerable attention, and passed speedily through six editions, entitled, 'The Queen or the Pope? The Question considered in its

Political, Legal, and Religious Aspects, in a Letter to S. H. Walpole, Esq.;' and in the same year, the year of the Great Exhibition, appeared an imaginative apologue of the Crystal Palace, 'The Lily and the Bee.' The writer's object in this beautiful and impressive "Message of the Lily" and "Lesson of the Bee" was "to record the general impressions on his mind and heart from the transcendent and profoundly instructive spectacle of the Great Exhibition." Many mistook Mr. Warren's philosophical poem, written, as it was, in mystical and broken utterances, as emanating from an over-wrought fancy, but it was impossible to read without emotion the author's fervid expressions of intelligent wonder, warming frequently into reverent worship, present objects calling up rich trains of historic associations, lofty thoughts and generous feelings, in combination with graphic and glowing descriptions. The style of the Apologue is in great measure in imitation of a poem of King Alfred, a fragment of which is quoted, and in reference to which it is said in the preface, "much of what follows it has been humbly attempted to fashion on that exquisite model." In the following year 'The Lily and the Bee' was transated into Italian by Girolamo Volpe, under the title of 'Il Giglio e l'Ape,' and into German.

Among Mr. Warren's contributions to 'Blackwood's Magazine' may be mentioned an admirable memoir of Sir William Follett (January, 1846), and reviews of Alison's 'Life of the Duke of Marlborough' (February, 1852), of Mrs. Stowe's 'Uncle Tom's Cabin' (October, 1853), and of Townsend's 'Modern State Trials.' In reviewing this last work, Mr. Warren's taste for the morbid in medical and juridical literature had free scope, and separate articles appeared in 1850 and 1851 with the titles, 'Romance of Forgery,' 'Duelling,' and 'What's in a Name?' 'The Murdered Glasgow Cotton Spinner,' 'Trial of Daniel O'Connell,' etc.

Mr. Warren was appointed Queen's Counsel in 1851, Recorder of Hull in 1852, and a Master in Lunacy in 1859. From February 1856 to 1859 he sat in Parliament in the Conservative interest, as Member for Midhurst. In 1835 he was elected a Fellow of the Royal Society, and in 1853, on the Installation of the Earl of Derby, he became a D.C.L. of Oxford.

HUGH CUMING, F.L.S.

The natural history of foreign seas and countries is abundantly studied by men who "live at home at ease" in the midst of cabinets and books, dependent for their specimens of birds, shells, or insects, on the stores of dealers in such objects; but the number of those who have undergone the arduous personal exertion of collecting them, with a scientific spirit, in their native haunts, is comparatively few. Of this small number the life and adventures of Mr. Hugh Cuming present one of the most remarkable instances on record. It is to the collecting of shells that Mr. Cuming has mainly directed his attention; and it is chiefly owing to the care with which he has noted the habits and geographical distribution of their molluscan inhabitants that the studies of the conchologist have come to possess an interest of a philosophic kind which was formerly unknown.

Hugh Cuming was born on the 14th of February, 1791, at West Alvington, Kingsbridge, Devon. In that richly-wooded county, where slugs and snails abound, he commenced at a very early period of his childhood to make a collection of their pretty shells. Kingsbridge was at that time the home of the celebrated author of the 'Testacea Britannica,' Colonel Montagu; and it was under his friendly patronage and encouragement that a taste for conchological pursuits was fostered in Hugh Cuming, until it became the ruling passion of his life. At the usual age he was bound apprentice to a sailmaker, and the selection of this business having brought him into contact with men of seafaring habits, he was induced, in 1819, to undertake a voyage to South America. Here he settled himself as a sailmaker at Valparaiso. Being thus transported into a country where the shells are of a much more

striking and beautiful character than any that he had seen before, Mr. Cuming's passion for collecting largely increased. He was especially delighted, on searching among the rocks, to observe the size and beauty of the Chitons and Fissurellas that inhabit that coast. The enthusiasm with which he exhibited his treasures to the people of Valparaiso excited a lively interest in his researches, and he was greatly befriended, amongst others, by the English Consul-General, Mr. Nugent, who introduced him to any officers of the Navy that happened to visit the port, and from whom he often obtained contributions to his shell cabinet.

In 1826 Mr. Cuming declined business, and determined upon undertaking an exploring expedition. With this object in view, he built himself a yacht, fitting it up expressly for the convenience of collecting and storing specimens of natural history, and in the following year he sailed for a cruise among the islands of South Polynesia. The first place he touched at was the little island of Juan Fernandez, and proceeding thence across the Pacific in the direction of the Society Islands, one of the next that he visited was Pitcairn's Island, memorable in history as an instance of an uninhabited island having become colonized by a fine athletic family of Christians, speaking English, descendants of the mutineers of the 'Bounty.' Five-and-thirty years had passed since the mutiny; and old John Adams, the good seaman, who had been pressed into it, still survived. Mr. Cuming found him nobly engaged in the pastoral and patriarchal offices so touchingly described by Captain Beechey, and having spent a week with him in his house, he continued his voyage, staying some time at Tahiti, where he became intimate with Queen Pomare.* The rich conchological novelties that now rewarded Mr. Cuming's toil in dredging,

* In 1815, when Captain Sir Thomas Staines touched at Pitcairn's Island in the 'Briton,' two of the natives were invited to dine with him in his cabin. They were tall, handsome youths, six feet high, with dark hair and open pleasing countenances, and having no clothes except a piece of cloth round the loins, and a straw hat ornamented with black cock's feathers, their fine form and muscular limbs showed to great advantage. On setting something to eat before them, these apparently half-savages suddenly clasped their hands together, and one of them, to the inexpressible astonishment of the Captain, repeated in solemn English the familiar words, "For what we are going to receive, the Lord make us truly thankful." They proved to be sons, by Tahiti mothers, of Christian and Young, two of the mutineers of the 'Bounty' nurtured in the fear and admonition of the Lord by old John Adams.

wading, and wandering, induced him to spend upwards of a twelvemonth among the various little-known islands of this wide expanse of ocean, especially the coral-reef islands, many of which had not been hitherto visited by any naturalist; and he reached home laden with spoils collected from sea and land.

On his return to Valparaiso, and after a few months spent in turning over the produce of his cruise, Mr. Cuming commenced preparations for a voyage of more extended duration along the western coast of South America. His eight years' residence at Valparaiso had allowed time for his researches in natural history to be widely known and respected, and he started on his second conchological expedition furnished with important advantages. The Chilian Government granted him the privilege of anchoring in the different ports free of the charges, and of purchasing stores free of duty. He was also supplied with letters to the authorities of the different States, who, in consequence, received him with marked attention, and on finding his pursuits entirely free from any political curiosity, rendered him every possible facility. At one port, and only one, along the whole line of coast from the Isle of Chiloe, in lat. 44° S., to the Gulf of Conchagua, in lat. 13° N., did Mr. Cuming experience any difficulty. On approaching Xipixapi, Ecuador, West Columbia, his little yacht, though carrying the Chilian flag, was taken for a Peruvian frigate. The Peruvians had rendered themselves obnoxious to the West Columbians by besieging the city of Guayaquil. Mr. Cuming was surrounded by an armed force, his papers were seized, and he himself was taken prisoner to the capital. He assured the Governor that his vessel was not so large as the twentieth part of a Peruvian frigate, and having given testimony of the harmlessness of his avocations, he was set at liberty, with many apologies for his capture.

After nearly two years spent in exploring the western coast of South America, dredging while under sail and at anchor in the bays and inlets, searching among the rocks, turning over the stones at low water, and rambling inland over the plains, river-banks, and woods, Mr. Cuming returned with all his stores to England. It was in 1831 that the evening scientific meetings of the Zoological Society began to be enlivened by the brilliant displays of new shells, described from Mr. Cuming's cabinet by the late Mr. Broderip and the late Mr. G. B. Sowerby, while Professor Owen undertook the severer task of describing the anatomy

of some of the more interesting of the mollusks preserved in spirits.

In 1835, although Mr. Cuming's conchological novelties were far from being exhausted, he began to entertain the project, while in the fulness of health and strength, of visiting some of the islands of the Eastern hemisphere, and fixed upon the Philippine group as the field of his new researches. It happened that the Society to whose Transactions and Proceedings the results of his labours had so bountifully contributed, was presided over by a nobleman, Edward, thirteenth Earl of Derby, who took a substantial interest in the progress of zoological discovery, and himself employed collectors abroad for procuring specimens. The authorities of the Spanish Government were known to be exceedingly jealous of any foreigner approaching the Philippine Islands, but, through the influence of Lord Derby with the Spanish Ambassador in London, General Alava, Mr. Cuming obtained letters from Madrid to the Governor-General of Manilla, Don Andres Garcia Camba, and to the Minister of Finance, Don Luis Urrejola, who furnished him with letters to the governors of the different provinces into which the islands are divided, and gave certain necessary orders to the commandants of the gunboats placed at the different islands for their protection; whilst a letter from the Spanish Government, introducing Mr. Cuming to the Archbishop of Manilla, Don Francis José Segui, procured him a hospitable welcome among the clergy wherever he presented himself.

The importance of this mode of proceeding will be seen by the subsequent narrative. Although Mr. Cuming's dredgings and wanderings by the sea-shore were by no means inconsiderable, his attention was chiefly directed to the dense woods and forests of those luxuriant islands, which were suspected to be richly populated with snails. At every step of his progress he became the guest of the priests, whom he found living in comparative splendour. They placed their equipages at his service; and he travelled from town to town in handsome carriages, and from port to port in large boats, manned, some of them, with from thirty to forty oars. Everywhere a hospitable reception, with apartments and the best of living, followed, and the services of the school children, numbering in some places as many as four or five hundred, were secured to scour the woods for snail-shells. Nearly all the towns and villages of the Philippine Islands have public schools,

supported at the expense of the Spanish Government, and Mr. Cuming invariably succeeded in his intercession with the priest to get the scholars a holiday during his stay to help in collecting shells; and there was no want of rivalry among them, for their exertions were always liberally rewarded. Mr. Cuming generally managed to keep a little heap of silver coins in sight, and he distributed them to the shell-gatherers according to the measure of their contribntions. Shells which gladdened his eyes day after day by their exceeding novelty and beauty were brought to him in quantities which seemed prodigious. Sometimes, when a stray specimen of a particular kind was observed among a multitude of others, the fortunate discoverer was rewarded with an extra coin, and off he would run again to the woods with the pattern specimen to search for further supplies; and others, catching sight of the bribe, would follow him, with the hope of gaining a similar reward. The natives, of course, thought the strange visitor was no more in possession of his reason in collecting such a quantity of snail-shells than was the demented Lear in gathering straws. At the island of Siquijor, where the priest's house was situated on an exposed elevation, in the middle of the town, Mr. Cuming could be seen through the open windows of his apartment busy sorting and packing. During the day-time, no particular interest was aroused, but when it grew dark, and Mr. Cuming was still seen with his assistants groping and flitting about with candles, his mysterious and apparently unappeasable restlessness excited some uneasiness; and the public authorities went in a body to the priest and demanded to know what sort of man he had got living with him. The Spaniards who came there, they said, always took money from them (the poll-tax); but this man gave them money, throwing it about like dirt. Mr. Cuming was frequently assailed with the inquiry, 'for what purpose did he collect such a quantity of shells?' It was in vain that he endeavoured to explain that they were to put in cabinets as specimens of natural history. The natives of the Philippine Islands are in the habit of making an ash of burnt shells to assist in chewing the betel-nut. They cut the nut into slices, and wrap them up, with the shell-ash, in leaves of the pepper-plant. And he resorted to the expedient of telling them that his shells were all destined for use in a similar process in England. This at once satisfied their inquiries. Wherever Mr. Cuming travelled, he exercised considerable influence over

the natives by practising as a medicine-man. He always carried a supply of quinine with him, and found it an unfailing remedy in the cure of fever. Hence he was everywhere feared and sought after, and his statements were listened to with the same respect for their sincerity as those of the priest.

After four years spent in this manner among the Philippine Islands, Mr. Cuming returned to England, and he has been untiringly engaged during the twenty-four years since elapsed in arranging and completing his collection, adding immensely to it by the purchase and exchange of specimens, and getting the species described and figured by conchologists at home and abroad. At present his cabinets contain not fewer than thirty thousand species and varieties, several specimens of each. The homage paid to Mr. Cuming by naturalists in all parts of the world, on account of his assiduity and enterprise in forming this wonderful collection, is quite remarkable; more especially on account of its containing the types of nearly all the numerous species described in this country during the last three-and-thirty years, the greater portion of which have been illustrated by Mr. G. B. Sowerby, Jun., in his 'Thesaurus Conchyliorum,' and in a more extended work of fourteen quarto volumes, with nineteen hundred plates, by the writer of this memoir.

It must not, however, be supposed that Mr. Cuming's researches have been confined to shells. During three excursions which he made in the Philippine Islands, starting each time from Manilla, he collected, in addition to shells, large numbers of birds, reptiles, and even quadrupeds, and an immense number of insects and plants. Of plants, he collected as many as 130,000 dried specimens for the herbarium, and a quantity of magnificent orchids, most of which, sent home alive in Ward's cases, proved to be new to the cultivator. The proceeds of Mr. Cuming's wanderings among the Philippine Islands filled 147 large cases, ninety of which he brought home with him to his house in Gower Street, in three large waggons. Mr. Cuming has disposed of his duplicate specimens to the various public and private collections of Europe and the United States, and takes pleasure in acknowledging that his expenses and labours have been amply repaid.

JULIUS BENEDICT.

Julius Benedict, the subject of this memoir, was born at Stuttgard, on the 27th November, 1805, and at a very early age gave such large indications of musical promise and proficiency, that he became, on reaching his ninth year, the pupil of Abeille for the pianoforte and harmony. Under this master he made the most rapid advances, and at thirteen years of age produced a *Cantata* of sufficient merit, on the occasion of the death of Queen Catherine of Würtemberg, to assure those who heard its performance of the brilliant career that was before him. His native town not furnishing him with sufficient opportunities for rapid advancement, he was induced, in 1820, to visit Munich, whence he proceeded to Weimar, where, placing himself under Hummel, he continued to avail himself for eight months of that celebrated *maestro's* tuition. Weimar, however, was much too contracted a locality for the development of the youthful musician's powers; he therefore speedily sought a larger sphere at Dresden, and became the pupil of Carl Maria von Weber, who accepted him simply on account of his talent, since that celebrated composer had hitherto refused to receive any *élèves* under his care, on account of the annoyance the drudgery of teaching occasions. The relation between master and pupil may be easily understood when it is said that Julius Benedict not only remained four years at Dresden, but accompanied Weber to Berlin and Vienna, witnessing the first performance (1818) of 'Der Freischütz' at the former, and the 'Euryanthe' (1823) at the latter capital. Impressed with a high consideration of his *protégé's* talent, and assured of his competency to undertake the highest duties of his profession, Weber procured for him, in 1825, the important post of Musical Director at Vienna, under Duport, where the discharge of his duties was so efficient that he ex-

changed this situation for one of greater prominence at Naples, under Barbaja, where he filled the office of *Maestro al Cembalo* and Conductor both at the San Carlo and Fondo Theatres.

Although the demands of his position now drew largely upon his time, Julius Benedict found sufficient leisure for composition, and having already produced the music of two Ballets, 'Enea nel Lazio' and 'Le Minière de Beanjon,' besides a considerable number of vocal and pianoforte pieces, he brought out (1827) his first opera, 'Giacinta ed Ernesto,' the cast of which included Mlle. Unger, the Neapolitan *buffo* Casaccia, Fioravanti, and the celebrated Rubini. The success of this work was sufficient to induce him once more to devote himself to this range of musical creation, the result of which was another opera, 'I Portoghesi a Goa,' which, interpreted by Mlle. Adelaide Tosi, Winter, Benedetti, and Lablache, added considerably to his already established celebrity. The fame of the young *maestro* having now become established, he was induced, soon after the reception of his second effort, to make a tour through Italy, during which he gave concerts at Naples, Lucca, and Milan, and proved himself to be an accomplished pianist no less than as a brilliant composer.

From Italy, Julius Benedict was once more drawn towards the place of his birth, where the reputation he had legitimately earned from the most severe of musically critical countries, had already gained for him great renown, to be immediately enlarged upon the performance of his opera in German. From Stuttgard he once more wended his way to Dresden and Berlin, and having there won golden opinions from those who witnessed the fulfilment of their prognostications of his celebrity, he determined to spend the winter in Paris, making the progress of his art the chief occupation of his residence in that captivating city. In March, 1831, he returned to Naples, and not long afterwards had the good fortune to make the acquaintance of Mme. Malibran, who, with her usual appreciation of talent, at once foretold his future career, and set herself to assist him in achieving its advantageous results. By the inducement of this gifted *artiste*, he proceeded to Bologna in 1832, and visited England in 1835. Immediately on his arrival in London he took a position, his first concert, given on the 15th of July, being the most successful of the season of that year. On this occasion Mmes. Malibran and Grisi assisted, and sang the celebrated duet from Mercadanti's 'Andronico' together. Although

his reception in London was all he could have desired, he was not induced immediately to fix his residence there, but, intending to return to Italy, he passed part of the winter of 1835–6 in Paris.

In the spring of 1836 a *buffo* opera was initiated at the Lyceum Theatre, and Julius Benedict was selected as *chef d'orchestre*, simply on account of the talent he had exhibited during the preceding summer. From London he set out again for Naples, where, soon after his arrival, an operetta, 'Un Anno ed un Giorno,' one of the most felicitous of his creations, was performed for the *début* of Signor Frederic Lablache, the worthy and estimable son of the great *basso profundo*. Returning to London in the winter of 1837, he brought this successful operetta with him, and gave it at the Lyceum Theatre, where he again occupied the position of Musical Composer and Conductor.

Having now established himself permanently in London, Julius Benedict commenced the arduous duties of his profession with his wonted energy; but, finding that no *maestro* can exist in our cold climate merely as a composer, he also devoted his attention to tuition. In spite of the tax upon his time and patience which tuition necessitated, he threw off no less than three operas between the years 1838 and 1846,—'The Gipsy's Warning,' 'The Bride of Venice,' and 'The Crusaders,'—the success of which has been quite as much of European as of English celebrity.

From 1844 to 1846, Julius Benedict occupied the post of Musical Composer at Covent Garden, first under the direction of Madame Vestris and Mr. Charles Mathews, and afterwards of Messrs. Charles Kemble and Bunn, and raised the character of that theatre by the taste, tact, and judgment he manifested in the management of the operatic department.

Amongst the great triennial musical *réunions*, that of Norwich has always held a prominent rank. It was, therefore, as high a compliment as could possibly be paid to Julius Benedict when the Committee requested him to undertake the distinguished office of conductor of the Festival of 1845,—a position he still continues to occupy, to the satisfaction of the Committee as well as for the advancement of art. In this year, notwithstanding the arduous nature of his numerous professional avocations, he made several journeys through the United Kingdom with the principal Italian vocalists, acting as pianist and conductor at a series of highly successful concerts. On the opening of the Philharmonic

Hall at Liverpool in 1849, Julius Benedict's acknowledged talent secured for him the direction of several grand concerts, by which the erection of that building was inaugurated.

In 1850 Julius Benedict accompanied Mme. Lind-Goldschmidt (then Jenny Lind) to the United States and Cuba, where he remained nearly twelve months, during which he conducted no less than 122 concerts in all the principal cities and towns of the American continent. On his return to Europe, severe domestic affliction befell him by the death of a son through an accident from the falling of the funnel of a steamboat on the Rhone, and speedily afterwards by the decease of his amiable and accomplished wife. Gradually, however, listening to the claims of his art, Julius Benedict proved to the world, in 1857, that he had lost none of his pristine talent, by the manner in which he wrote an overture and incidental music to the tragedy of 'Macbeth,' which was played at Her Majesty's Theatre on the occasion of the marriage of the Princess Royal with the Crown Prince of Prussia. From that period to the present he has been indefatigably prosecuting his labours, conducting, during the seasons of 1859 and 1860, Italian Operas at Drury Lane and Her Majesty's Theatres, conjointly with Signor Arditi. During this engagement he composed the recitatives and arranged Weber's 'Oberon' for the Italian stage, an adaptation which has deservedly won the highest encomiums. Amongst the more recent works by which he has increased his fame, the following may be especially mentioned:—'Undine' and 'Richard Cœur de Lion'—Cantatas written for the Norwich Festivals of 1860 and 1863; and the 'Lily of Killarney,' brought out at the Royal English Opera in 1862. He is also at the present time engaged upon the composition of a grand opera under the title of 'Esmeralda,' the libretto of which is founded upon Victor Hugo's celebrated novel. Amongst his unproduced and unpublished works are an operetta, just complete—'The Bride of Song;' a romantic opera—'The Minnesinger;' an oratorio—'St. Peter;' and many detailed and vocal pieces.

Julius Benedict is now a "naturalized" Englishman, and permanently resides in London, where he enjoys deservedly the good opinion of musicians, having won for himself the warmest friendships, both within and without the circle of a profession he has adorned by his works, and promoted by his assiduity.

THE RIGHT REV. THE BISHOP OF ST. DAVID'S.

The name of this distinguished historian and eminent prelate will at once associate itself in the mind of the reader with the highest order of intellectual movement which has taken place during the last thirty or forty years, whether in the world of letters or of religious thought. His first introduction to the literary republic may indeed be placed at a far earlier date, and it is curious to mark, in this instance, a rare example of juvenile precocity sustaining its early promise, without failure, throughout a lifetime. In the year 1809 was published a small volume, entitled, "Primitiæ; or Essays and Poems on various subjects, religious, moral, and entertaining, by Connop Thirlwall, eleven years of age. Dedicated, by permission, to the Lord Bishop of Dromore. The preface by his father, the Rev. Thomas Thirlwall, M.A., Minister of Tavistock Chapel, Broad Court, Long Acre; Lecturer of St. Dunstan, Stepney, and Chaplain to the Lord Bishop of Dromore." The volume is a collection of productions, wonderful enough, considering the age of the writer, and contains a frontispiece, with a portrait of the youthful author before photography was dreamt of, announcing that he was born on the 11th of February, 1797. His father was then resident at Mile End, and afterwards became rector of Bower's Gifford, Essex. From the preface to this little work, we learn that he had learnt Latin at three years of age, and could read Greek at four with ease and fluency; and the result proves that these early signs of great ability were such as to warrant the indulgence of the highest anticipations on the part of his parents and friends.

From home he was sent to the Charterhouse, and thence to Trinity College, Cambridge. At the University he became Bell's

Scholar in 1815, and Craven Scholar in the same year. In 1818, he graduated as twenty-second Senior Optime, and First Chancellor's Medallist (the Classical Tripos not having been established till 1824). In the same year he became Fellow of Trinity, and was appointed Classical Examiner in 1828, 1829, 1832, and 1834. In 1824, he was called to the Bar at Lincoln's Inn, but withdrew from practice in 1828. From that date commenced Mr. Thirlwall's well-remembered career as Tutor at Trinity College, where he contributed as much as any one to found and promote the modern school of classical study for which that society is distinguished. A succession of scholars, from that time, treading in the footsteps and following the method of Thirlwall, have sustained the renown of the college, but to him mainly is due the honour of having struck out for it the path to eminence.

In 1831, an important work, the production of the joint labours of Julius Charles Hare and Connop Thirlwall, was given to the world. This was the translation of Niebuhr's 'History of Rome,' which produced a great and lasting effect upon English classical literature. This work was violently assailed by the 'Quarterly Review,' in an article which was replied to by the translators with a power of criticism and force of satire which gave a *quietus* to all such attempts for ever. Mr. Thirlwall also took part, with his friend Hare, in conducting the 'Cambridge Philological Museum.'

The publication, in 1835, of the first volume of the 'History of Greece,' made known to the world at large those powers and accomplishments, the observation of which had hitherto scarcely extended beyond the University. The medium by which this celebrated work was given to the public was, as everybody knows, Dr. Lardner's 'Cabinet Cyclopædia,' of which it forms by far the most important section. It is interesting to observe the terms in which, on the 12th of June, 1835, it was first announced. "The plan of the little work," it is stated, "begun in this volume has been considerably enlarged since it was first undertaken, and the author fears that a critical eye may be able to detect some traces of this variation from the original design in the manner of treating one or two subjects. He would be glad if he might believe that this was its only fault." The writer proceeds to state that there are two classes of readers to whom it is addressed, one, those who desire to have something more than a superficial knowledge of Greek history, but who possess neither the leisure nor the means

of studying the original sources; the other, those who have access to the ancient authors, but who need an interpreter.

Mr. Thirlwall had doubtless been preceded, as he was followed, in his remarkable enterprise. He came upon the traces of Mitford, a writer, who, by his inaccuracy and partiality, roused not only the severity of the more accurate scholar, but the indignation of the more high-minded political partisan; and every reader remembers what sharp stings of satire are to be found in the notes of Thirlwall's History, whether he is castigating the want of political honesty, or merely the bad scholarship of his predecessor. A few other writers come in for a share of this discipline; and the general aim which seems to have animated the writer's studies and lent weight to his arm, may perhaps be gathered best from the following note to vol. iii. of the History, p. 6:—The high authority which Boeckh has so well earned by his learning and candour, entitles even a passing, and perhaps hasty remark of his, to more attention than is due to all the attempts, which for the last forty years have been systematically made in our own literature,—the periodical as well as the more permanent,—for political and other purposes, to vilify the Athenians." The eight volumes were published at intervals down to the year 1844. It would be in vain here to point to the various remarkable features of a work, which has been so long before the public, and which is so necessary to the pursuits of the scholar.

A pamphlet which was published in the year 1833, in favour of the admission of Dissenters to some University privileges, led to the removal of Mr. Thirlwall from the Lectureship at Trinity College. In 1834 he was presented by Lord Brougham, then Chancellor, to the living of Kirby Underdale, Yorkshire; and on the death of Dr. Jenkinson, he was, in the year 1840, elevated to the See of St. David's.

From that period the Bishop of St. David's has taken an active part in the deliberations of the House of Lords. His first vote was given on the 11th June, 1841, in favour of the Jews' Declaration Bill, a measure of relief of which he has always been the advocate. His speech on that occasion was an admirable specimen of reasoning, in dealing with the various objections to the measure which were most strongly presented, and coming from a Christian bishop, whose motives and principles were alike unimpeachable,

its effect was doubtless very great. Still, the consideration that the Bill would alter the Christian character of our institutions was too mighty to be got rid of for the present. In 1843, arose the question of the union of the Sees of St. Asaph and Bangor, and Lord Powis introduced a Bill for the purpose of preventing that union. The measure obtained the unflinching support of the Bishop of St. David's, although it was opposed by the Duke of Wellington and the Archbishop of Canterbury; but, notwithstanding the pleas that were strongly urged in favour of the interests of the Welsh people, the first Bill was withdrawn, and another in 1844 was decisively rejected. The result was the foundation of the See of Manchester. In the following year came the proposal, by Sir Robert Peel's government, for the endowment of Maynooth. The Bishop of St. David's speech in favour of the endowments is another instance of close and concentrated argument, amongst the whole train of which, perhaps, the most pointed question was the following:—"Will you do no good, because you cannot do pure and unmixed good?" These and similar reasons were ultimately successful in carrying the measure. As may be expected, the Religious Opinions Relief Bill, and the measures for the Repeal of the Corn Laws, found a supporter in the Bishop of St. David's. He spoke in favour of the measure introduced by the Marquis of Lansdowne, in February, 1848, for establishing diplomatic relations with Rome, and the speech is remarkable as containing laudatory expressions on the character of the Pope, whom he describes as "actuated by the very genius of good sense, and influenced by a spirit of the most exalted patriotism." How speedily this eulogium became a dead letter, and the grounds for congratulation on the good sense and patriotism of the Pope were dissipated by the political storms of 1848, it is needless to observe.

A more important proposal was that introduced by the late Bishop of London, in 1850, for transferring the jurisdiction in appeals from the Ecclesiastical Courts upon matters of doctrine from the Privy Council to a bench of fifteen bishops. In the debate on this vitally interesting measure, the speech of the Bishop of St. David's will again command our admiration for its wisdom and political foresight; we may add, also, its patriotism, when we remember that to speak against such a proposal required a thorough emancipation from episcopal prejudices. To the Marriages Bill,

on the other hand, Bishop Thirlwall has always been strongly opposed, and his judgment has been, in this matter, signally borne out by the deliberate voice of public opinion. So in the debate on the Ecclesiastical Titles Bill in 1851, the Rescript of the Pope was recognized by him to be not only an insult to the country, inasmuch as it ignored the established rights of the Church, but an injury, in that it violated the law of the land, and invaded the Queen's prerogative. In 1853, the Bill for enabling the Canadian Parliament to deal with the Clergy Reserves in that country was passed, and was aided in its progress by the Bishop, who considered that its rejection would be neither honourable nor safe, this being a matter of local domestic interest to the Canadian people. In the debates on the Divorce Bill in 1857, the Bishop of St. David's, though he did not formally oppose the measure, declared that he looked forward to its operation with "strong apprehension and much anxiety," feelings which experience has undoubtedly justified. He opposed Lord Shaftesbury's hasty measure for amending the Religious Worship Act, Lord Lyttelton's Subdivision of Dioceses Bill, and Lord Ebury's proposals for the Revision of the Liturgy. On the other hand, he supported the Church of England Special Services Bill, he voted in favour of amending the Act of Uniformity as to the "assent and consent" of the clergy to everything contained in the Prayer Book, and last year he recommended in Parliament the reference of the Burial Service Question to Convocation.

In the later religious movements of the day, the Bishop of St. David's has been frequently called upon to speak and act. In a series of triennial visitations to the clergy of his diocese, he has from time to time delivered charges, which discuss in his own masterly and philosophical style the questions which have stirred the Church and the religious mind of the country during the interval. Thus, the address in 1848 is directed in a great measure against 'The Theory of Development' of John Henry Newman. That in 1851 enters into a consideration of the case of *Gorham* v. *The Bishop of Exeter*, in which the Bishop found no ground for alarm as to innovation of doctrine in the sentence of the Judicial Committee. In 1854, the revival of Convocation was the subject brought before the clergy of the diocese, a project to which Bishop Thirlwall lent much support; and in the deliberations of that body since he has taken an active share. Three years later, a class of subjects, which

have since powerfully aroused the attention of clergy and laity, began to exhibit itself. Dr. Rowland Williams, the Vice-President of St. David's College, Lampeter, (of which the Bishop is the Visitor,) published a pamphlet, entitled 'Rational Godliness after the Mind of Christ, and the written Voices of His Church.' Inasmuch as this production appeared to some, in the language of the charge, "seriously to affect the supremacy and infallibility of Scripture as the Divine rule of faith and practice," its contents were formally brought before the notice of the Bishop by seventy clergymen of his diocese; and to this representation the more important passages of the charge are an answer. The Bishop declares, that whilst he should feel himself bound to resist to the utmost the introduction of error, he yet considers it to be no less a sacred and important duty "to respect and, as far as lies in me, to protect that freedom of thought, word, and action which the Church has hitherto granted to her ministers and members, and neither to make nor sanction an attempt to place it under any new restriction which she has not thought fit to impose." He proceeds to lay down that "no man is to be convicted of heresy on a construction of words which he may not himself admit;" and after referring to the belief which any one may entertain as to the doctrine of the plenary inspiration of Scripture, he adds: "When this individual consciousness is set up as the common measure of truth, to which all are required to conform under penalty of excommunication from Christian fellowship, it becomes an instrument of aggression on the rights of conscience, and an usurpation of the authority which belongs to the Church." He reminds his hearers finally that "the Church has pronounced no decision, laid down no definition on the subject." This memorial, and the reply which it called forth, are a very remarkable prelude to the astonishing agitation which was produced in 1860 by the publication of a volume of apparently anything but exciting materials,—the well-known 'Essays and Reviews.' This is a history which is familiar to every one of our readers, and it is only necessary to allude to it for the purpose of completing our narrative by mentioning those points on which the Bishop of St. David's has since declared himself. A writer in the 'Edinburgh Review,' in an article which appeared in April, 1861, had commented with some severity upon the proceedings of the Bishops, who, as will be remembered, in a private meeting held some short time before, had unanimously

agreed publicly to censure the work in question. When Convocation met in February, 1863, the Bishop of St. David's took occasion to remark that the strictures of the reviewer had proceeded, in some respects, upon a wrong assumption, viz. that certain extracts from the book which were appended to the names of the original subscribers had been before the Bishops when their names were affixed to the document. The Bishop declared that not one of the extracts was placed before them, and expressed his wonder at the reviewer's silence, to whom this error of fact had been long before communicated. This called forth a letter from the reviewer, which appeared in the 'Guardian' of February 25, 1863,—an important communication in many ways, not only as respects the Bishop, but as regards the history of the 'Essays and Reviews' movement. It then appeared that a correspondence had taken place between the Edinburgh Reviewer and the Bishop, in the course of which the former explained that the complaints of the 'Review' were directed, not to the fact of the Bishops' having selected certain passages on which to found their condemnation, but that they had left the public completely in the dark as to the grounds of their decision. The writer went on to say that he was glad to acknowledge his mistake in supposing that there was any abandonment of his Lordship's views as expressed in his introduction to Schleiermacher's essay; and, after hinting pretty broadly at the additional animosity which had been given to the conflicting parties in the agitation, by reason of the 'Episcopal Letter' of 1861, he appealed to the Bishop that he would continue to lend his powerful aid, "as in former times," to calm the popular agitation, and that he would deliver his "weighty judgment" in favour of the views now pronounced to be heretical.

The mention of Schleiermacher's essay was an allusion to the publication, in 1825, of 'A Critical Essay on the Gospel of St. Luke, by Dr. F. Schleiermacher, with an Introduction by the Translator.' The translator was long believed, and is now acknowledged, to have been Mr. Thirlwall, then a Fellow of Trinity College, Cambridge, and a layman, as the above-mentioned dates show. The importance of this introduction, which contains some expressions to the effect that the "verbal inspiration of Scripture had long been abandoned by the learned," and showing the distinctions that had been drawn between the "inspiration of suggestion" and the "inspiration of superintendency," is, under the cir-

cumstances we have pointed out, less than it might at first seem. The preface to the book is not by the translator, but by the writer of the essay.

In a reply to this letter in the 'Guardian' of the 4th of March, the Bishop acknowledges himself to have been the author of the introduction, and with reference to the subject of which it treats refers to his charge of 1857 as being the expression of his views on the subject, by which he wishes to abide.

On the more recent subject of the book of the Bishop of Natal, the views of the Bishop of St. David's will be best gathered from the charge delivered to his clergy at the visitation of 1863, in which the whole bearings of this question, considered in relation to the Church of England, are discussed.

Since then the decision of the Privy Council, in the case of Dr. Williams and Dr. Wilson, two of the Essayists, has been delivered, which in many respects alters the relations of the various parties.

It may be added, that Dr. Thirlwall is the author of many sermons, essays, and lectures on occasional subjects; that he has devoted much care and attention to the cause of education, in all its departments, and that in his diocese he will long be remembered as the first Bishop who for some centuries had ministered to Welsh congregations in their own language.

JOHN GOULD, F.R.S.

In John Gould, the ornithologist, worthy successor of Bewick, Audubon, and Wilson, but far transcending them in the range and value of his researches, we have an interesting example of a self-taught lad of humble birth having raised himself to a high position as a scientific man by his own innate love of nature, indomitable zeal, and tasteful practical abilities. As in early youth he became a lover of birds from the charm exercised upon his senses by their tuneful notes, their brilliant plumage, and their instinctive habits, so in maturer years he was led by his artistic talent to make drawings of them, excelling in picturesque grouping and accuracy any hitherto produced, and by his love of field-sport to travel with his gun into newly explored lands for the acquisition of specimens by which to elucidate an important portion of the world's natural history.

Born at Lyme, in Dorsetshire, on the 14th of September, 1804, John Gould removed, with his parents, while yet an infant, to the neighbourhood of Guildford, Surrey; and it was on the wild commons and heaths of that district that at the early age of five to six years he ran about in search of flowers and insects. Soon he commenced to make collections of them, and at the age of bird-nesting to ramble in search of eggs, which he strung and hung around the cottage window. In 1818 John Gould's father obtained an appointment as foreman in the Royal Gardens of Windsor under Mr. J. T. Aiton, and having removed his family thither, young Gould now commenced the active business of life in the royal gardens. "I've gathered many a bunch of dandelions," we once heard the ornithologist remark, "for Queen Charlotte's German salads." Whatever John Gould put his hand to, he la-

boured at with the same determined zeal which characterized all his subsequent proceedings. After some years spent at Windsor, he was placed by Mr. Aiton under the care of Mr. Legge, gardener at Ripley Castle, Yorkshire, the seat of Sir William Ingleby, with the object of learning the higher branches of forcing; but his love of natural history predominated over all, and in 1827, he came to London and obtained the appointment, which then happened to be vacant, of Curator to the Zoological Society. This very interesting and flourishing institution had not been long established. Sir Stamford Raffles, one of its founders, was dead, but among the active members of its Council were one or two ardent lovers of ornithology, especially Mr. Vigors and Mr. Broderip; and the taste of its new Curator had therefore ample scope for encouragement, both in collecting new birds and in describing them at its evening scientific meetings.

Soon after joining the Zoological Society, at the outset of his scientific career, an event occurred in Mr. Gould's life which largely influenced the direction of his future pursuits. He married the daughter of Nicholas Coxen, Esq., of Kent, a lady of considerable accomplishments, especially in drawing, and in a very short time was projected Mr. Gould's first great ornithological work in imperial folio, 'A Century of Birds from the Himalaya Mountains,' of which the plates were drawn on stone, from the author's sketches, by Mrs. Gould. Mr. Gould now gave up his Curatorship of the Zoological Society, and devoted himself to the production of that magnificent series of works (all of imperial folio size) with which his name and fame are identified. During the next five years, from 1832 to 1837, Mr. and Mrs. Gould were occupied with 'The Birds of Europe.' The work was completed in five volumes, at the price of £76. 8*s*., and it is now out of print. Of Mr. Gould's next work, 'The Birds of Australia,' completed in 1848, in seven volumes, price £115, we shall speak more in detail.

The birds of Australia were much too little known to give Mr. Gould a hope of being able to publish any adequate illustration of the ornithology of that remarkable continent. He therefore determined upon making a personal investigation of them, and of their manners and habits, in a state of nature. Mr. and Mrs. Gould left England in May, 1838, and returned in 1840, having explored, during that period, Tasmania, the islands of Bass's Straits, South Australia, and New South Wales, penetrating the

last-named country to a distance of nearly four hundred miles from the coast line, while he dispatched his assistant, Mr. Gilbert, to explore the western and northern portions of the country. Mr. Gould's researches, he tells us in the preface to his great work, commenced immediately after passing the Equator, from whence, throughout the entire route to Australia, he lost no opportunity of studying the habits and collecting the different species of the oceanic birds that came under his notice. Of his collections formed on the Australian continent and adjacent islands, some idea may be gathered from an account of the circumstances which led to the destination of his typical specimens.

In 1848, after seven years of uninterrupted labour, Mr. Gould's work, 'The Birds of Australia,' was completed, and he was naturally anxious that the specimens therein figured, most of which were new, and of the utmost rarity and value, especially as being the original types of the species, should be preserved in the British Museum. They comprised examples of both sexes of nearly every known species of Australian bird, 1800 specimens in all, in various stages of plumage, each carefully labelled with its scientific name and the name of the place where killed; and they were, of course, mostly new to our national Museum. A sum of two thousand pounds having been spent in the expedition by which they were acquired, it was not to be expected that Mr. Gould could present them as a donation. He offered them to the Trustees for the moderate sum of £1000 in money, or as a gift if they would purchase twenty-five copies of his work. The offer was declined, and Mr. Gould was induced, under his disappointment, to accept £1000, immediately tendered for the collection by an American, for the Academy of Natural Sciences of Philadelphia.

Mr. Gould's joys in the accomplishment of this expedition to Australia and Tasmania were not, however, without a heavy balance of sorrows. Within one short year of his return Mrs. Gould, who had made an immense mass of drawings, both ornithological and botanical, suddenly died, and he lost at different times as many as three of his assistants; Mr. Gilbert, who went out a second time to explore the Swan River district, and was afterwards killed by the natives while making his way overland with Dr. Leichardt's party from Moreton Bay to Port Essington; Mr. Drummond, killed by one of the natives while seeking for specimens in Western Australia; and another attendant, accidentally

killed by the explosion of a gun while landing from a boat on one of the islands of Bass's Straits. Mrs. Gould's artistic labours have been since ably discharged by Mr. Richter, but her personal loss has proved irreparable, Mr. Gould not having married again. She left three sons and three daughters. The three sons, educated at college, each took their Bachelor's degree. The eldest, Dr. J. H. Gould, surgeon in the 2nd European regiment, unhappily died a short time since in Scinde; the second, Charles Gould, distinguished by eminent scientific attainments, holds the appointment of Geological Surveyor-General in Tasmania; the third, Franklin Gould, born at Government House, Hobart Town, the residence of Mr. Gould's attached friend, the lamented Sir John Franklin, who since perished in the Arctic regions, is destined for the medical profession.

The next subject in ornithology taken up by Mr. Gould was 'The Birds of Asia,' of which sixteen three-guinea parts are published, and nearly as many similar parts have been produced of a work on 'The Mammals of Australia.' Here Mr. Gould engaged with his characteristic vigour in a department of zoology that was entirely new to him. "It was not," he says in the preface to that work, "until I arrived in Australia, and found myself surrounded by objects as strange as if I had been transported to another planet, that I conceived the idea of devoting a portion of my attention to the mammalian class of its extraordinary fauna. The native black, while conducting me through the forest, or among the park-like trees of the open plains, would often point out the pricking of an opossum's nails on the bark of a *Eucalyptus* or other tree, and indicate by his actions that high up in yonder hole was sleeping an Opossum, or Flying *Petaurus*." Numerous species of kangaroos and opossums were nightly brought to their bush fires to be roasted and eaten by the natives; and when after a long and laborious day's work the party would encamp for the night by the side of a river, by a natural pond, or by a waterhole, Mr. Gould would stretch his weary body on the bank, and watch the little concentric circles on the water, formed by that remarkable intermediate link between quadruped and bird, the Duck-billed *Ornithorhynchus*.

While the works already noticed were in preparation, Mr. Gould found time to publish also one or two special monographs of particular groups of birds, all in the same splendid style of imperial

folio. In 1834 appeared his monograph of those curious large-billed birds, the Toucans; in 1838, one of the Trogons; and in 1850, one of the Partridges of America. His crowning triumph has, however, been a 'Monograph of the Humming Birds,' in which he succeeded, by means of a new process, in giving a very effective representation of the metallic lustre of the plumage. The production of this monograph in five magnificent volumes, of which the price is £78. 15*s.*, affords another remarkable instance of Mr. Gould's enterprising assiduity and talent. The humming bird does not inhabit the eastern hemisphere, and Mr. Gould had been collecting specimens for twenty years without seeing it alive. The essential characteristic of all Mr. Gould's illustrations of birds is to give the species, male and female, with its natural mode of flight, its special nest, and the particular plant on which it loved to perch. The humming birds, some scarcely larger than our humble-bee, approach nearer to insect life in their habits than any other kind of bird. Some are possessed with the same marvellous powers of flight to enable them to sip the nectar of the flower while poised at the corolla's mouth, and the bills of different species are more or less lengthened according to the depth of the flower into which it dips for food. How was it possible to illustrate a monograph of the humming birds in the style which our ornithologist had made his own, from a contemplation of their stuffed skins! "In passing through this world," says Mr. Gould, "I have remarked that when inquirers of a strong will really set themselves to attain a definite object they generally accomplish it; and in my own case the time at length arrived when I was permitted to revel in the delight of seeing the humming birds in a state of nature, and to observe their habits in the woods and among the great flowering trees of the United States of America and in Canada." Mr. Gould did not visit the principal centre of habitation of the humming bird, the West Indies, Venezuela, and New Granada, but he attained his desire of bringing one of the only two species inhabiting North America (*Trochilus colubris*) alive to Europe. "For some time," he says in his monograph, "a single humming bird was my constant companion during days of toil by road and rail, and I ultimately succeeded in bringing a living pair within the confines of the British Islands, and a single individual to London, where it lived for two days, when, from the want of proper food or the change of climate, it died." Mr. Gould

had, however, by this time formed a wonderful collection of skins and mounted specimens. During the time of the Great Exhibition of 1851, he kindly gave the public an opportunity of seeing it in one of the houses in the gardens of the Zoological Society. At the present time this unrivalled collection, which now comprises about 400 species, is displayed in an elegant saloon at Mr. Gould's house, 26, Charlotte Street, Bedford Square, where it is at all times accessible to men of science, for the purposes of examination and comparison.

The price of a single copy of the grand series of works above enumerated is four hundred guineas. With how much persistent energy and industry must Mr. Gould have worked upon them during the five-and-thirty years occupied in their production! Mr. Gould is essentially a sportsman, and nothing is allowed to stand in the way of his personally observing the facts necessary for the elucidation of their habits and geographical distribution. He is now engaged in illustrating 'The Birds of Great Britain' on the same grand scale; and while his lithographer is transferring his drawing of a species to stone, he may be gone to Norway to study its mode of breeding, or to Malta to observe it on its passage.

Mr. Gould was elected a Fellow of the Royal Society in 1843 and he is an Honorary Member of numerous foreign and provincial societies.

THOMAS FAED, ESQ., A.R.A.

Amongst the figure painters of the present day, there is one before whose works everybody stands to gaze and admire, be he or she old or young, gentle or simple. This favoured and favourite artist, who has a charm for all eyes, and whose compositions go straight to every heart, is Mr. Faed. Who is there who is not familiar with the humour, grave or gay, with which his works abound? and what critical judgment does not acknowledge, with sincerity, that in his hands there is always an elevating tendency, that the jocular element is never tainted with vulgarity, and that the homely and domestic is not without its touch of the sublime?

Something more than taste, however, is necessary to the success of a leading painter; and Mr. Faed's career is no exception to the rule, that only by long and arduous study is eminence in the arts to be achieved. He was born at Burley Mill, in the Stewartry of Kirkcudbright, in the year 1826. John, his elder brother, has been distinguished as a draughtsman and a painter at Edinburgh. Their father, who was an engineer and millwright, died in the year 1844, and Thomas, the subject of our memoir, thereupon, or shortly before, betook himself, at the suggestion of the elder brother, to the Scottish capital, where he ardently pursued the bent of his genius in the School of Design. Whilst there, he came under the notice and tuition of the celebrated Sir W. Allan, and his skill and industry were rewarded by numerous prizes in the annual competitions with his fellow pupils and scholars. It is related that his earliest exhibited work was a water-colour drawing from the 'Old English Baron;' but he soon abandoned this branch of art, and took to the higher domain of oil-painting, studying figures with unremitting assiduity.

In the year 1849, he was proficient enough to obtain the rank of Associate of the Royal Scottish Academy. Among the works exhibited in Scotland, that which is best recollected is a group representing 'Sir W. Scott and his Friends at Abbotsford.'

Still resident in Edinburgh, we find him, in the year 1850, exhibiting at the Royal Academy, with three works, 'Cottage Piety,' 'Auld Robin Gray,' and 'The First Step;' but in the next or following year, rising rapidly in public estimation, and finding his powers increase, he betook himself to London, and commenced a series of pictures which have been gradually but uninterruptedly successful. It is his good fortune to be the master of a class of subjects which are of all others most popular, and which, when multiplied by engraving, command an entrance to the hearths and homes of the million. Accordingly, not a work of social life or domestic incident makes its appearance, which is not at once submitted to the engraver, and so finds its way to circles which are perhaps closed to every other description of art production.

In 1852, a picture representing the 'Visit of a Patron and Patroness to a Village School' excited some attention. 'Sophia and Olivia,' in 1853, showed a good deal of experimental treatment in the lighting of the figures, but still was an advance; and a similar sparkling effect was attained in a subject exhibited in 1854, called 'Peggy,' from Ramsay's 'Gentle Shepherd.' In the following year, a still further progress in public esteem was achieved by the 'Mitherless Bairn,' where a simple tale is told in an obvious manner with much force and beauty. This has been engraved by Mr. Samuel Cousins, and is a great favourite.

It was in 1856, however, that the true scope and real extent of Mr. Faed's powers revealed themselves in two capital productions, which at once advanced him to the foremost ranks of the figure painters not members of the Academy. One of these was 'Home and the Homeless,' in which the contrast is presented between the interior of a thriving labourer's cottage, where the good man is coaxing his child with an apple, and the wan and abject figure of a beggar woman outside, whose hungry orphan child creeps up to the table. This is the picture that has been engraved by Henry Cousins. The other was 'Highland Mary,' one of Mr. Faed's most carefully-coloured and best finished works. This also has been engraved by W. H. Simmons, and is universally known and admired.

Next year came the scene, well known from Mr. T. L. Atkinson's engraving, the 'First Break in the Family.' The mail coach in the distance bears off the boy, the pride of the cottage family, from the old and young folks, who watch its departure with varied emotions.

In 1858 was exhibited a picture, in which the humour of the artist came out more powerfully than hitherto—'A Listener ne'er hears gude o' himsel'.' The listener, it will be remembered, had written to his sweetheart a letter, "saft, couthie, and slee," and was now on the point of paying her a visit with the "brawest cheap shawl" he could find. He creeps to the doorway, and the scene which meets his gaze is best described in the words of the poet Ballantine, who wrote them on first beholding the picture:—

> "There sat my braw Joe wi' young Colin Dalzell,
> An' his glaiket sister, wha tongue 's like a bell,
> A gigglin, an' ettling my letter to spell—
> A listener ne'er hears gude o' himsel'."

In this picture Mr. Faed displayed a more vigorous execution than before, stronger colour, and, above all, a keen dramatic zest, which infallibly asserted his artistic strength. This work has also been engraved by Mr. Atkinson. The 'Ayrshire Lassie' (since engraved by C. Tomkins) appeared also this year,—a fainter revival of the 'Highland Mary' of two years before.

Mr. Faed's picture in 1859 was 'Sunday in the Backwoods,' representing the devotions of Scotch emigrants in Canada under the roof of a grander kirk than any they had left behind them—the stems and vaults of the over-arching forest. This work has been engraved by Mr. Simmons. The painter was more at home in the genial picture, entitled 'My ain Fireside,' since engraved by Mr. J. Stevenson.

In 1860, the only exhibited work was a rare bit of Scottish humour, 'His only Pair,' suggested by some lines from Burns's 'Cotter's Saturday Night,' a picture which has been engraved by Mr. Simmons. This was followed on the next occasion by Mr. Faed's hitherto greatest work, 'From Dawn to Sunset.' He was now (1861) an Associate of the Royal Academy, and his first exhibition was worthy of his new honours.

The motto that accompanied this was, "So runs the round of life from hour to hour;" and the scene, it will be remembered,

displays infancy, youth, middle age, and decrepitude, in the circle of one family, reminding us of the Shakespearian cycle of the Seven Ages of Man. Clearly as the ideas were conceived, the execution was of the highest order that had yet been seen, the boldness not frittered away by over-finish and prettiness, and the light not too much broken up and scattered. It was universally felt to be one of the most successful specimens of figure painting that has appeared of late years. A masterly engraving of this, Mr. Faed's diploma picture, by Samuel Cousins, R.A., will appear in the Exhibition of the Royal Academy for the present year.

In the following year, there were two single figures, 'Kate Nickleby,' and 'A Flower from Paddy's Land,' showing the painter in a new light, as a student of flowers of the most delicately intricate forms and dazzling colour. 'New Wars to an Old Soldier' was a more elaborate group. A handsome country girl was seen leaning her elbow on the table, reading the news to her grandfather, on whose knee a child was perched, dressing up the old man's thumb in likeness of a red-coated soldier. The face and head of the old man were a marvellous example of exact and careful study. The details of furniture also were very curious and cleverly painted. Last year the pictures were, 'Train Up a Child,' etc. the 'Irish Orange Girl,' and the 'Silken Gown.' Mr. Faed's pictures sent to the Royal Academy for exhibition in the present year are a group of six figures, 'Baith Faither and Mither,' and 'Our Washing-Day,' with a single figure.

A small collection, but embracing some of the finest of the works above mentioned, and several others, among the rest, 'Conquered but not Subdued,' 'Daddie's Coming,' and 'Coming Events Cast their Shadows Before,' were to be seen some twelve months since at Messrs. Jennings's Rooms, Cheapside.

Mr. Faed can scarcely be said to have reached the height of his powers, and the future before him promises to be a brilliant one.

MAJOR-GENERAL SIR H. C. RAWLINSON, K.C.B., D.C.L., F.R.S.

Sir Henry Creswicke Rawlinson, one of the most distinguished men among the many men of ability which the service of the East India Company has produced, was born at Chadlington, in the county of Oxford, the seat of his father, Abram Tyzack Rawlinson, Esq., in the year 1810. Mr. Rawlinson was famous in the county for his zeal in all field sports, and for his skill in rearing and training race-horses, with one of which, "Coronation," he won the Derby in the year 1841.

Sir Henry Rawlinson received the greater portion of his education at the well-known School of Ealing, near London, and from this he proceeded, at the early age of seventeen, to Bombay, where he served in the Bombay Grenadier Regiment till the year 1833. During this period few events occurred which gave him any prospect of distinguishing himself: however, besides passing an Interpreter's examination in Hindustani and Mahratta, he had time to perfect himself in the study of Persian, the knowledge of which proved of great value to him in his later career. It was, indeed, mainly in consequence of his remarkable proficiency in this language, that he obtained the appointment in 1833 which sent him for the six following years to Persia, nominally to train the Shah's army in European warfare and tactics, but with far more valuable results to science, in that his residence in Persia enabled him to commence and gradually perfect that wonderful interpretation of the Cuneiform inscriptions for which his name will ever live among historians and scholars.

He would seem during these years to have been fully occupied alike with his military and his philological studies, and to have resided chiefly at Kermanshah, though, at the same time, he was able,

as we know from various admirable reports he forwarded to the Government of the day, to travel over nearly all the western provinces of Persia, and to make minute and valuable researches into their past and present geography.

At the end of 1838, in consequence of the rupture of diplomatic relations between the British and the Persian Governments, he was compelled to retire to Baghdad, where he occupied himself in arranging for publication the materials that he had collected during his six years' service in Persia. He was not, however, long permitted to remain in lettered seclusion at that city. War had broken out between the Indian Government and the Afghan Empire, and Sir John Keane had been sent across the Indus with the mad object of forcing upon an unwilling people a ruler whom they detested and had once already rejected. Under these circumstances, and just as he had completed for publication his first essay on the decipherment of the Cuneiform texts from Behistun, Sir Henry (then Major) Rawlinson was recalled from Baghdad to India, and placed under the orders of the Envoy at Cabul. In the spring of 1840 he travelled from Bombay to Cabul, and on his arrival at the Afghan capital was appointed joint Envoy with Arthur Conolly, to visit the Uzbeg Courts of Khiva and Kokan.

Before the mission, however, started, the state of Western Afghanistan induced Sir W. Macnaghten to order Major Rawlinson to that quarter. In the summer of 1840, the lamented Conolly set out on his fatal journey alone, and Major Rawlinson took up his abode at Candahar as Political Agent for Western Afghanistan. He remained in this post for more than two years, and did not return to India till the end of 1842, when the successes of the armies under Sir W. Nott and Sir George Pollock had retrieved in some degree the disasters the English had suffered at Cabul under General Elphinstone.

He now remained for a year in India, settling the accounts of the Candahar force, at the expiration of which time he was appointed by Lord Ellenborough to the Political Agency of Turkish Arabia, as a reward for his Afghan services. Arriving at Baghdad in December, 1833, he received shortly afterwards, in March, 1844, his commission as H.B.M. Consul. In 1850, he obtained the local rank of Lieutenant-Colonel in Turkey; and in 1851 he became Consul-General. In this position, he remained at Baghdad,

with the exception of a brief visit to England, the first he had made after twenty-two years of incessant service in the East, till 1855, when he finally left Baghdad, and, resigning his post, settled in England. Shortly after this he was appointed a Crown Director of the East India Company, and subsequently formed one of the Council of India, resigning, at the same time, his seat in the House of Commons, where he served for one session as M.P. for Reigate.

In April, 1859, on the retirement of Mr. Murray, he was sent, at the direct instance of the Queen, as Envoy Extraordinary and Minister Plenipotentiary to the Court of Teheran, with the local rank of Major-General, and remained in this appointment till June, 1861, when he returned to England. Sir Henry Rawlinson has received many honours, both for his public and his literary services. He is a Military C.B. (1844), and a Civil K.C.B. (1856); a K.L.S. and K.D. for services in Persia and Afghanistan; also a Chevalier of the "Order of Merit" of Prussia. In England he is an F.R.S., D.C.L. of Oxford, and LL.D. of Cambridge, also Director of the Royal Asiatic Society, and Vice-President both of the Royal Geographical Society and Royal Society of Literature, and a Fellow of numerous other societies besides. Abroad he is a Corresponding Member of the Institute of France, and he has received diplomas from the Academies of Munich, Pesth, Amsterdam, and Cambridge in America, and also from the Oriental and Geographical Societies of Berlin and Leipsic.

It is certain that Sir Henry Rawlinson will be best known to posterity, as a military man, for his memorable defence of Kandahar,—and as a scholar, for his complete deciphering, first of the Persian branch, and ultimately of the Assyrian class of the Cuneiform inscriptions. We shall therefore say a few words now on each of these subjects.

We have stated that in June, 1840, Sir Henry Rawlinson was sent from Cabul to undertake the responsible post of Political Agent at Candahar to the Anglo-Indian army under Sir W. Nott. The times were most critical. Since the famous entry of Shah Shujah into that city, in April, 1839, escorted by Sir John Keane's army, the English had stormed and taken Ghaznee, and, advancing to Cabul, had placed the Shah on his throne: a short breathing-time had occurred, till at length the outbreak commenced at

Cabul on November 1st, 1841, and ended, as is well known, in the entire destruction of all the English troops that had assembled around the capital of the Afghan Shah.

The news of this event did not reach General Nott at Candahar immediately, but the tribes around that town were at once observed to be in a state of great disturbance, and a detached force under Colonel Maclaren, which had marched from Candahar southwards towards India on November 7th, was promptly recalled for the defence of the place on the advice of Major Rawlinson; and it appeared that this step was taken not a day too soon, as accounts soon after arrived of the insurrection at Cabul, with bad tidings from Colonel Palmer at Ghaznee and Major Leech at Kelat-i-Ghilgi, showing clearly enough that the whole intervening country was up in arms. Major Rawlinson was now for some time engaged in attempting negotiations with the different chiefs of the neighbourhood, or in sowing seeds of dissunion among them. Neither plan, however, fully succeeded, and he at length resolved on one of the boldest steps ever taken by an officer supported by so small a force (probably not more than from 4000 to 5000 serviceable troops), viz. the compulsory expulsion from a town numbering some 80,000 to 100,000 people, of all the Afghan and therefore disaffected families. After long pondering over this step, Rawlinson finally executed it on the 3rd of March, 1842, and compelled some 6000 persons to depart at a moment's notice,—a measure no doubt involving much suffering and some injustice, but absolutely necessary under the circumstances in which the handful of English troops under Nott and Rawlinson found themselves. It is right to add, that in all his plans, Rawlinson was on the whole well supported by General Nott, though the letters of the General show plainly enough that he had little sympathy with, and no belief in "Politicals."

The 10th of March and the night following were probably the most trying of Rawlinson's life. After the clearing of the city, General Nott marched out with nearly his whole force to attack the Afghans without the walls. As he advanced, they fell back, making, however, a feint to fight. When they had enticed the unwary General far enough, the bulk of them doubling upon him fell back upon the city, which they attacked with the utmost fury till midnight of that day. The enemy were, however, completely baffled by the determined courage of Colonel Lane and Major

Rawlinson, who resisted all their attempts, step by step,—blocking up the burning Herât gate with bags of corn, or pouring into them vollies and vollies of musketry, which told with dreadful effect upon their crowded and ill-disciplined host. On the 12th Nott returned, and from this time Candahar was safe. It however owed this safety wholly to the pluck of Rawlinson and Lane, for the General had been clearly out-manœuvred by the Afghan chiefs, and mainly by one Mirza Ahmed. Rawlinson remained at Candahar till the final advance of the army to which he was attached, resisting, in perfect harmony with General Nott, successive orders, first from General Elphinstone at Cabul, and, latterly, from the new and vacillating Governor-General, Lord Ellenborough, to give up Candahar and fall back either to Cabul or India. There can be no doubt that their firmness saved the army entrusted to them, and enabled it in the autumn of 1842 to march *viâ* Kelat-i-Ghilgi and Ghaznee, and thus to make its celebrated junction at Cabul with the army under Sir George Pollock, who had come by the famous passes from Jelalabad. During the whole of this period Major Rawlinson's services were of the highest value, as is clear from the luminous dispatches which he, on several occasions, transmitted to the authorities; nay, more than this, it is not too much to say that, in spite of General Nott's horror of "Politicals," he would have been much less successful had he not had the constant practical advice of a man so thoroughly acquainted with the natives as his Political Agent happened to be.

On the second head, our debt to Sir Henry Rawlinson, as one of the first Oriental scholars of the day, may be said to commence from the time when, at his solitary post near Kermanshah, in Persia, he first seriously devoted himself to the interpretation of the famous trilingual inscription, in Persian, Babylonian, and Median Cuneiform writing, still existing on the face of the mountain of Behistun.

We gather from his famous Memoir in the Tenth Volume of the 'Asiatic Journal,' that he commenced his researches in 1835, by an analysis of certain sculptured tablets at Hamadan; that by the end of 1837 he had copied and deciphered the principal paragraphs on the Behistun monument, and that during that winter he forwarded to London the translation of the first two paragraphs, which contain the titles and genealogy of Darius, the son of

Hystaspes. During 1838, and the early part of 1839, he was still engaged on the same work, the latter portion of the time, while resident at Baghdad, enabling him to finish his first memoir on the subject. Finding, however, that during his long absence in the East, in localities where books were not to be procured, many valuable papers, especially those by Burnouf and Lassen, had been published in Europe, he resolved entirely to recast his Memoir, and was engaged in this task when, as we have seen, he was recalled from Baghdad to India, and was therefore not able to resume it again for three years. Ultimately, the Memoir was published, with facsimiles of the inscriptions, in 1846, nine years after it was first sketched out. Since that period Sir Henry Rawlinson has worked with great assiduity at the Cuneiform inscriptions, the study of the first branch, the Persian, having led to the complete development of the far more difficult Assyrian. With this view he has been for several years engaged with Mr. Norris in the publication of the extensive collection of Assyrian texts preserved in the British Museum, one volume of which, in folio, was published in the year 1861, another being now nearly ready for the press. Shortly, too, after his first return to England, in 1850, he assisted in editing a portion of the volume of inscriptions collected by Mr. Layard during his travels.

Sir Henry Rawlinson has been an active contributor of most valuable papers to some of the best journals in England. Thus, to the early volumes of the Geographical Society he has contributed, during the period he was resident in Persia, three valuable papers:—1. On a march from Zohab along the mountains of Zagros to Khuzistan. 2. A journey from Tabriz through Persian Kurdistan to Takht-i-Suleiman, etc. 3. A memoir on the Atropatenian Ecbatana; and, more recently, Notes on the Ancient Geography of Mohammerah and its Vicinity, and a letter on the Comparative Geography of Afghanistan. Of these, the Memoir on the Atropatenian Ecbatana is perhaps the most remarkable paper, for the extraordinary amount of classical and Oriental learning it contains, that has ever been published in the journal of any society.

To the Society of Antiquaries Sir Henry Rawlinson has given a short paper on the Sculptured Rock of Behistun, published in 1850; and to the Royal Society of Literature a very interesting

one on the illustrations of Egyptian History and Antiquities from Cuneiform Inscriptions, published in the Seventh Volume of their Transactions (1862). To the Asiatic Society of London he has given the entire Tenth Volume, to which we have more than once alluded, as containing the complete working out of the problem of the interpretation of the Persian Cuneiform inscriptions; a Vocabulary of the ancient Persian language, and an Analysis of the Babylonian Inscriptions at Behistun, together with a Memoir on the Babylonian Inscriptions, which have not been completed, chiefly owing to the pressure of more important work; a general account of the inscriptions of Assyria and Babylonia, and especially of the Nimrod Obelisk, the substance of two oral addresses made by him to the Society on January 19 and February 16, 1850; 'Outlines on Assyrian History,' 1852. 'Early History of Babylonia,' 1854. 'On the Birs-i-Nimrud, or Great Temple at Borsippa,' 1855; and 'The Orthography of some of the Later Royal Names of Assyrian and Babylonian History,' 1855. In all of these the student will perceive the same wonderful power of grasping and dealing with details, which he will observe in his great paper on the Atropatenian Ecbatana. Sir Henry Rawlinson has, too, supplied his brother's translation of Herodotus with a vast number of valuable notes, and with some most learned and comprehensive essays upon various topics of Assyrian history.

It could hardly be that any one dealing with topics so difficult and subjects so abstruse should not have met with many opponents, not a few disbelievers, and some jealous and ill-tempered detractors. To them he may well quote the words of M. de Longpérier, himself better qualified than most men to give an opinion on the subject: "Jamais il nous trouvera dans le rang de ceux qui dénigrent les travaux philologiques, et nous serons heureux de pouvoir bientôt faire part aux antiquaires de notre pays des perfectionnemens et des progrès sur lesquels l'incontestable érudition de M. Rawlinson nous donne le droit de compter." (Revue Archéol., Nov. 1850.)

The public is but imperfectly acquainted with the circumstances under which Sir Henry Rawlinson relinquished his honourable and lucrative post as Her Majesty's Minister in Persia, and retired into private life in England; but we have reason to think that it occurred as follows. Sir Henry undertook the duty as an Indian

officer under the Secretary of State for India, and with the full understanding that his mission was to be conducted on the same liberal footing, and subject to the same general policy, as the other Eastern missions upon which he had served. Shortly after his arrival, however, in Persia, he found the mission summarily transferred to the Foreign Office. His liberty of action was at once curtailed; his hands fettered with "red tape;" and his dealings with the Shah placed, as he termed it, "under the strait-waistcoat of European diplomacy." Believing it to be impossible to consolidate relations between the British and Persian Governments under such conditions, and feeling, moreover, that faith had not been kept with him, he resigned his post and returned to England; but it is a matter of notoriety that, during his brief tenure of the office of Minister at Teheran, he acquired a degree of personal influence both with the Shah and his Court that has never been attained by any other European since the days of Malcolm. Sir Henry's qualifications, indeed, as a diplomatist are not inferior to his claims as a military man or as a scholar. Among the many papers which he has drawn up on public affairs, we may refer to an article on our "Political Relations with Persia," in the 'Calcutta Review' for 1849; a pamphlet on the "Overland Telegraph to India," published by J. Murray in 1862; and very pointed speeches on the "Transfer of the Government of India to the Crown;" on the "Career of Sir James Outram," etc. etc.

W. B. CARPENTER, M.D., F.R.S., F.L.S., F.G.S.,

REGISTRAR OF THE UNIVERSITY OF LONDON.

Dr. William Benjamin Carpenter is the eldest son of the late Dr. Lant Carpenter, a dissenting minister highly esteemed for the philanthropy of his character and his success in education, though more widely known as an able writer on theological subjects: and is the brother of Miss Mary Carpenter, whose labours in the cause of juvenile reformation have gained for her a most honourable distinction. He was born in Exeter, on the 29th of October, 1813; but his family having removed to Bristol in 1817, the latter city became his home during his youth and early manhood. He received his general education entirely under his father's roof, where he enjoyed the advantage not merely of an excellent training in the ordinary branches of school study, but also of sound elementary instruction in physics and chemistry. His own tastes took so strongly the direction of science, as to lead him earnestly to desire to prepare himself for the profession of a civil engineer; but the development of the railway system having at that time scarcely commenced, no opening seemed to present itself in the line of his choice; and he was induced by the wishes of his family to accept an offer made by his father's intimate friend Mr. J. B. Estlin (a general practitioner of high standing in Bristol, and brother-in-law of Dr. Prichard) to receive him as his pupil, and to prepare him for the medical profession. He commenced his apprenticeship to that gentleman in 1828; and during the latter part of it attended lectures at the Bristol Medical School, and hospital practice at the Bristol Infirmary. His scientific tastes also were cultivated by the opportunity he enjoyed of attending the excellent courses of lectures delivered at that period in the Bristol Philosophical and Literary Institution: his obligations to which, for the

advantages he derived from it during the earlier part of his student-life, he has taken many opportunities of publicly acknowledging. In the winter of 1832, he was requested to accompany Mr. Estlin, the state of whose health made it desirable for him to have recourse for a time to a warm climate, to the West Indies; and with him he resided for four months on a sugar-estate, in the beautiful island of St. Vincent, also visiting Grenada.

On his return home, he resumed his professional studies at the Bristol Infirmary and Medical School, and thence proceeded to London in the autumn of 1834, attending lectures at University College, and medical and surgical practice at the Middlesex Hospital, where he acted for a time as clinical clerk to Dr. Watson. In addition to the ordinary curriculum of professional study, he entered to the course delivered by Dr. Grant, on Comparative Anatomy; from which he carried away not only a large amount of valuable information, but also an earnest love of the subject, as one to which his special attention should be directed if opportunity should serve. In the autumn of 1835 he passed his examinations at the College of Surgeons and Apothecaries' Hall, and then proceeded to Edinburgh, where he devoted himself in the first instance to the study of Physiology under Dr Alison, and of Materia Medica under Dr. Christison, and also to that of Clinical Medicine in the Royal Infirmary, where he was clinical clerk under Professors Alison, Christison, and Traill. He also joined the Royal Medical Society, of which he became an active member; and he there formed intimacies with several young men of his own or more advanced standing, who have since risen to distinction. Returning to Edinburgh in the ensuing session, he was elected the first of the four annual Presidents of the Society; and in that capacity delivered the Oration at its Centenary Commemoration, February 17, 1837.

Having been offered the Lectureship on Medical Jurisprudence in the Bristol Medical School, and having determined to enter upon general practice in Bristol, he did not remain at Edinburgh during the third winter which would then have been required for graduation; but delivered his first course of lectures in the summer session of 1837, and applied himself to the practice of his profession, with the intention of devoting his leisure hours to the scientific pursuits in which he felt a stronger interest. A paper which

he had read at the Royal Medical Society of Edinburgh, "On the Voluntary and Instinctive Actions of Living Beings," and which contained the germ of much that he subsequently developed in his writings on the physiology of the nervous system, had been already published in the 'Edinb. Med. and Surg. Journal;' and in July, 1837, appeared the first of his contributions (an article on Vegetable Physiology) to the 'British and Foreign Medical Review,' then edited by Drs. Forbes and Conolly. In the same year he became a competitor for the "Students' Prize," subscribed for by the students, and adjudged by certain of the Professors, of the University of Edinburgh; the subject being one proposed by Professor Alison, "On the difference of the Laws regulating Vital and Physical Phenomena." His essay proving the successful one, he appropriated the prize (£30) to the purchase of a Microscope; and from that time microscopic research became a leading object of his pursuit. The principal part of his prize essay was published in the 'Edinburgh New Philosophical Journal,' for April, 1838. The 'British and Foreign Medical Review,' of the same date, contained two elaborate articles from his pen: one of them, entitled "Physiology an Inductive Science," being a critique on the portion of Dr. Whewell's 'History of the Inductive Sciences' which relates to that subject; whilst the other, "On the Physiology of the Spinal Marrow," discusses very fully the doctrine of reflex action, then recently propounded as new by Dr. Marshall Hall. This last essay, though vehemently complained of by Dr. M. Hall as not doing justice to his merits, has been generally accepted by competent judges as a fair statement of the aspect which the question presented at that date, and as having placed the discussion of it upon a broader basis, as regards both the general doctrines of neuro-physiology and the history of those doctrines, than that to which Dr. M. Hall had himself been disposed to restrict it.

The subject of our biography was at this time applying himself to the execution of a design which had gradually matured itself in his mind—the production of a treatise on "General and Comparative Physiology," intended as an introduction to the study of human physiology, and as a guide to the philosophical pursuit of natural history; of which the first edition was published at the end of 1838. The novelty of its plan, and the general merits of its execution, obtained for this work a more favourable reception than

might have been justified by a severe scrutiny; the author's knowledge having been drawn rather from books than from nature, and his power seeming rather to be that of systematizing the facts collected by others, than of adding to the store by original research. As a training and discipline to his own mind, the course of study which he went through in its production was most valuable to him; and he has had reason to believe that even in its original crudity, the work was of service in giving a scientific direction to the studies of others. But the reputation which it gained for him was rather injurious than beneficial in regard to his prospect of success in practice, and did not, at the time, appear to open the way for him to any other means of maintaining himself.

Some alterations in the regulations of the University of Edinburgh having enabled him to graduate by three months' additional residence, he proceeded thither early in 1839, and took his M.D. degree in that year; sending in as his Thesis a dissertation which he had previously read at the Royal Medical Society, "On the Physiological Inferences to be deduced from the Structure of the Nervous System of Invertebrated Animals." In this thesis, which obtained for its author one of the four gold medals then annually adjudged by the Senatus to the best productions of the kind, he applied the doctrines of reflex action to the nervous systems of Articulated and Molluscous animals, basing this application, however, not upon any original results either of anatomical or of experimental inquiry, but upon the facts of both kinds which had been already determined. These he showed to be inconsistent with the doctrines in regard to the functions of the gangliated cord in Insects, etc., which had, up to that time, been taught by Grant and Newport, on the basis of Sir C. Bell's views of the endowments of the different columns of the spinal cord in Vertebrata; and to be only explicable on the idea of each ganglion being an independent centre of reflex action for the organs supplied by itself, the actions of the whole series of ganglia being co-ordinated by the directing agency of the cephalic ganglia conveyed by the fibrous strands proceeding from them. The views thus advocated were at once adopted by Professor Owen and several other eminent physiologists, though opposed in the first instance by Mr. Newport; the subsequent inquiries of that excellent investigator, however, satisfied him of the correctness of Dr. Carpenter's doc-

trine, which was fully adopted by him in a memoir published in the Philosophical Transactions for 1843; and since that time it has passed into general acceptance.

In the course of the next year Dr. Carpenter made up his mind to devote himself to the cultivation of Physiological Science, and to seek his livelihood in lecturing, private teaching, and the use of his pen, rather than undertake the responsibilities and subject himself to the distractions of medical practice. He exchanged his lectureship in the Bristol Medical School for one on Physiology; and in the next year he brought out a second edition of his first work, which was speedily followed by his 'Principles of Human Physiology.' After completing this, he applied himself to the study of the microscopic structure of the shells of Mollusca, Crustacea, and Echinodermata, the first results of which were communicated to the British Association at its meeting in 1845, and were published in the 'Annals of Natural History' for that year; the details of his subsequent more extended researches, carried on by the assistance of grants from the Association, being published in its Reports for 1844 and 1847, with forty plates lithographed from original drawings. By these inquiries, which first gained for him a repute as an original investigator, he discovered that a very definite structural arrangement exists in the shells of Mollusca generally, which presents modifications that serve in many instances to characterize natural groups. The group of *Brachiopoda*, in particular, he showed to be thus distinguishable from other bivalves; and he further found that among the Brachiopods themselves, certain groups of species are differentiated from the rest by having their shells perforated with large canals, which are occupied in the living animal by cœcal prolongations of the mantle. This latter portion of the inquiry was subsequently extended by Dr. Carpenter through a much greater range, at the request of Mr. Davidson; to whose elaborate work on British Fossil Brachiopoda (published by the Palæontographical Society) he contributed an Introductory Memoir on the Microscopic Structure of the Shells of that group. In regard to the *Echinodermata*, he demonstrated that the calcareous reticulation which had been found by Professor Müller to constitute the basis of the skeleton in *Pentacrinus*, and of which Professor Valentin had shown the "test" and "spines" of the *Echinus* to be composed, exists in

some form or other through the entire class, of which its presence is a characteristic feature. And he was the first to show that the shells of the larger Decapod *Crustacea* have a tubular structure resembling that of dentine.

Although commenced in Bristol, these researches were chiefly prosecuted in London, whither Dr. Carpenter had removed in 1844, on his appointment to the Fullerian Professorship of Physiology in the Royal Institution. In that year also he was elected a Fellow of the Royal Society. In 1845 he became joint-Lecturer with Mr. Adams on Anatomy and Physiology at the London Hospital, undertaking the portion of the course devoted to General Anatomy and Physiology, which he continued to give for twelve years. In 1847 he was appointed Examiner in Physiology and Comparative Anatomy in the University of London, which post he held until he succeeded to the Registrarship; and in the same year (his term as Fullerian Professor having expired) he was elected by the Trustees of the British Museum to the Swineyan Lectureship on Geology, an appointment tenable for five years only. About the same time he succeeded Dr. Forbes in the editorship of the 'British and Foreign Medical Review,' to which he had been a constant contributor on physiological and psychological subjects from the date of his first connection with it; the Physiology of the Nervous System, in particular, having been very fully discussed in its pages; and an article on the Physiology of the Encephalon (October, 1846), having given a blow to the Gall and Spurzheim system of Phrenology, from which it has never since recovered. Advantage was taken of Dr. Forbes's retirement to unite with his Journal the 'Medico-Chirurgical Review,' originally established by Dr. Johnson; and to the 'British and Foreign Medico-Chirurgical Review' thus constituted, Dr. Carpenter devoted a large amount of time and energy during the next five years; not only bestowing on it a careful editorial supervision, but continuing to contribute largely on a greater range of subjects than he had discussed under Dr. Forbes's editorship. Thus, in the first number of the new Review (January, 1848), he drew attention to the treatise of Steenstrup on the "Alternation of Generations," and to the researches of Sir J. G. Dalyell on the Development of Zoophytes; and showed that the so-called "alternation" of form occurs only between the products of the *gem-*

miparous and of the *sexual* methods of multiplication, the latter only being truly entitled to the title "generation," and its products being always the same. The essential distinction between the two methods, notwithstanding the close apparent similarity which they present in many instances, he sustained in a subsequent critique of Professor Owen's 'Parthenogenesis;' and he had the satisfaction of finding the same view independently promulgated by Mr. Huxley, as the result of his researches on the *Acalephæ*. Another of his contributions to the Review, "On the Predisposing Causes of Epidemics" (January, 1853), in which he attempted to show that all the recognized agencies which prepare the body for the reception and development of zymotic poisons, have one common *modus operandi*, attracted considerable attention amongst those who have specially studied the conditions of the spread of those diseases.

In 1849, Dr. Carpenter was appointed Professor of Medical Jurisprudence at University College, as the successor to Dr. A. T. Thomson; and this chair he continued to hold until 1859. In 1850 he published, in the 'Quarterly Journal of the Geological Society,' a paper on the Microscopic Structure of *Nummulites* and certain allied genera, which was the first of his contributions to a department of zoological research—the Natural History of the *Foraminifera*—to which he has since devoted a large amount of successful labour. In the same year he communicated to the Royal Society a memoir "On the Mutual Relations of the Vital and Physical Forces;" in which he showed the application of the views not long before promulgated by Mr. Grove on the "Correlation of the Physical Forces" to Physiological science; maintaining that what is called "vital force" really has its origin in solar light and heat, not (as generally taught up to that date) in a power inherent in the germ; that which the germ supplies, according to his views, being the directive agency by which forces derived *ab externo* are used in the building-up and maintenance of the organism. This memoir, which was published in the Philosophical Transactions for 1851, made little impression at the time; but its conclusions have since been accepted as a part of the general doctrine of "Conservation of Energy," previously promulgated by Mayer and Helmholtz, but not at that time known beyond Germany.

In the spring of 1851, Dr. Carpenter published a third edition

of his 'General and Comparative Physiology,' to the preparation of which he had devoted all the time he could spare for two years, endeavouring to make it as complete in every respect as the existing state of scientific knowledge admitted. And he then applied himself to the preparation of a fourth editon of his 'Human Physiology,' similarly recast in an improved form, with the addition of an outline of the operations of the Mind, in which he developed those views of the relation of its *automatic* to its *volitional* activity, which had been suggested to him by the study of the parallel phenomena presented by the Nervous System. Of these physiological treatises it has been said, by a high scientific authority,* that they "have served, more perhaps than any others of their time, to spread the knowledge of those sciences, and promote their study among a large class of readers;" and that, "whilst they admirably fulfil their purpose as systematic expositions of the current state of knowledge on the subjects which they comprehend, they afford evidence throughout of much depth and extent of original thought on most of the great questions of physiology." About this time also he prepared for the 'Cyclopædia of Anatomy and Physiology' an article on the "Varieties of the Human Race;" in which he strongly upheld the doctrine of their specific unity, as that which is alone consistent with an enlarged view of their physiological and psychological relations.

In 1852, Dr. Carpenter was induced to undertake the office of Principal of University Hall; an institution on the plan of the Halls at Oxford and Cambridge, for the reception of students at University College. On accepting this appointment he relinquished the editorship of the 'Medical Review,' which had greatly interfered with his scientific pursuits; and devoted such time as he could command to the study of the Australian and Philippine Foraminifera, which had been placed in his hands by Mr. Jukes and Mr. Cuming, and which furnished the materials of four memoirs successively presented to the Royal Society, between 1856 and 1860. In these memoirs, which were devoted to the elucidation of the minute structure of the most highly-developed forms of the class, Dr. Carpenter "described some remarkable types which were previously quite unknown; he

* Sir B. Brodie's Presidential Address at the Annual Meeting of the Royal Society in 1861.

gave a detailed account of the very complex organization existing alike in the foregoing and in types previously well known by external configuration; he demonstrated the entire fallacy of the artificial system of classification (D'Orbigny's) hitherto in vogue, the primary divisions of which are based on the plan of growth; he laid the foundation of a natural system, based on those characters in the internal structure and conformation of the shell, which are most closely related to the physiological conditions of the animal; and finally, by the comparison of very large numbers of individuals, he proved the existence of an extremely wide range of variation among the leading types of Foraminifera; often reassembling under a single species varying forms, which, for want of a sufficiently careful study, had not merely been separated into distinct species, but had been arranged under different genera, families, and even orders. In this last conclusion, which has an important bearing on the question of the real value and meaning of natural history species generally, Dr. Carpenter's conclusions were fully borne out by the parallel inquiries of Messrs. Parker and Rupert Jones; which, relating to an extensive series of less developed types not especially studied by him, have formed, as it were, the complement of his own."*

During this period Dr. Carpenter was also giving much attention to that very curious psychological inquiry, the nature of those states to which the terms Mesmerism, Hypnotism, Electro-biology, Odylism, etc., have been applied; and he embodied the results of his inquiries in an article entitled "What to believe in Mesmerism," etc., contributed to the 'Quarterly Review,' for October, 1853. In this article he applied the doctrine of the automatic action of the mind under the influence of Suggestion, the Will being in abeyance, to the explanation of the phenomena of the conditions alluded to,—an explanation which has proved equally applicable to the *genuine* phenomena (those which are referable to trickery or to self-deception being excluded), since known under the general designation Spiritualism.

Whilst residing for a short time at Tenby, in the summer of 1854, with Messrs. G. Busk and Huxley, Dr. Carpenter applied himself to the study of the curious phenomena presented by the

* Address of the President of the Royal Society at the Annual Meeting, 1861.

embryonic development of *Purpura lapillus* (rock-whelk), which abounds in that locality. Each of the nidamental capsules of this species contains several hundred egg-like bodies, from which, however, only about thirty embryos are evolved, each of them many times larger than the ovum from which it originated; and it had been affirmed by MM. Koren and Danielssen that the entire assemblage of ova coalesces into a single mass, which subsequently breaks up into a smaller number of portions, each of which developes itself into an embryo. Dr. Carpenter, on the other hand, was led to the conclusion that of the total number of egg-like bodies only a few are real ova, the rest being yolk-segments; and that while the former develope themselves into embryos, after the usual plan of aquatic Gasteropods, it is the latter alone which coalesce. To the mass thus formed the embryos attach themselves by their mouths, and gradually ingest the particles of which it is composed, until it is all shared among them; they thus become distended to many times their original bulk, and on the additional store of nutriment thus obtained, their development is carried on to an advanced stage within the capsule. Dr. Carpenter's account of the process was warmly attacked by MM. Koren and Danielssen; but it has been fully confirmed by M. Claparède and other trustworthy inquirers; and there seems a strong probability that it is true of the Pectinibranchiate Gasteropods generally, since in many of them the like replacement of numerous small egg-like bodies by a few large embryos, has been observed.*

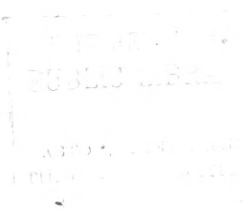
Another edition of both his large systematic treatises being called for, and the volumes having already attained an unsuitable bulk, Dr. Carpenter determined to divide the "General" from the "Comparative" Physiology, reducing the "Human" also by the omission of the topics treated in the "General;" intending that the "General" should thus serve as an introduction to either the "Comparative" or the "Human." He accordingly applied himself to the preparation of a *fourth* edition of the "Comparative," and a *fifth* edition of the "Human"; and would have forthwith proceeded to complete his design by bringing out the "General Physiology," had it not been for the urgency of his publisher, Mr.

* See the original memoir in the 'Transactions of the Microscopical Society,' for 1855; and Dr. Carpenter's defence of it in the 'Annals of Natural History,' for 1857, vol. xx., p. 16.

Churchill, that he should first fulfil a promise of long standing, to prepare a Manual entitled 'The Microscope and its Revelations.' This appeared in the spring of 1856; and shortly afterwards an event occurred, which made an important change in Dr. Carpenter's position.

It had always been Dr. Carpenter's earnest desire to be able to concentrate his labours on the subjects which he felt himself most fitted to pursue, instead of being forced, by the necessity of his position, to derive his income from a wide range of generally ill-remunerated exertion. A vacancy having occurred in the Registrarship of the University of London, he became a candidate for that office; feeling that its duties would be not uncongenial to his tastes, and hoping that they would leave him adequate leisure for the prosecution of the original inquiries to which he was most anxious to devote himself. To this post he was elected in May, 1856; and did not at first find its duties sufficiently exacting to require him to relinquish either his Professorship at University College, or his residentiary appointment; but he thenceforth ceased either to lecture or to examine on Physiology, and applied himself specially to the completion of those researches upon the *Foraminifera*, of which the nature and scope have been already explained. It was chiefly as a recognition of the value of his memoirs on this subject, though not without reference to his systematic treatises on Physiology, as well as to his other special researches, that one of the Royal Medals was awarded to him in 1861 by the Council of the Royal Society. The changes which were made in the constitution of the University under its New Charter of 1858, having brought with them the prospect of a considerable increase in the duties of the registrarship, Dr. Carpenter relinquished in 1859 both his other appointments; and thenceforth devoted himself undividedly to the administration of the University, which has provided for him ample business occupation, whilst leaving him intervals of leisure for the pursuits most congenial to his tastes. By availing himself of these, he has been enabled to prepare for the Ray Society, in conjunction with his friends Messrs. Parker and Rupert Jones, a systematic "Introduction to the study of the Foraminifera;" embodying the most important results of his previous researches, and basing upon these an entirely new system of Natural Classification, which has been ac-

cepted by the highest authorities, both in this country and on the Continent, as completely superseding the essentially artificial system of D'Orbigny. And since the completion of this work in 1862, he has been devoting himself to the preparation of a complete monograph on the Structure, Physiology, and Development of *Comatula*, for which he has been for several years collecting materials; considering no amount of labour misplaced in elucidating the history of an Echinoderm, which affords the only living example accessible to minute study of the Crinoidal type, that has formed so conspicuous a portion of the Marine Fauna through almost the whole range of Palæontological history. Relinquishing to others the duty he so long endeavoured to discharge, of systematizing from time to time the ever-increasing body of new materials accumulated by the activity of physiological investigators, he has determined to employ what may remain to him of time and ability, in the continued prosecution of original researches into such departments of Zoology as he may find most convenient opportunities of studying; in the hope that, whilst himself enjoying the purest and highest pleasure the pursuit of Truth can afford, he may be hereafter remembered as one who has done some service to Science.



JOHN PYE.

The subject of our present memoir, now in his eighty-second year, has obtained an eminent position in the world of art, firstly, from having been one of the originators of our present English school of Landscape Engraving; secondly, from having taken a prominent part in the foundation of the Artists' Incorporated Annuity Fund, established in 1810; and thirdly, in having been the stanch champion of his profession in its efforts, now crowned with success, to participate, as engravers do in other countries, in Academic honours, but for which he has never himself been a candidate.

John Pye was born at Birmingham, on the 7th of November, 1782. Having acquired some elementary art-knowledge, he came to London at the age of nineteen, and passed four years in the School of the well-known historical engraver, Mr. James Heath. But the French Revolution, and the wars which succeeded it, having destroyed the once flourishing foreign trade in English prints, the most elevating and profitable source of patronage that remained to British painters and engravers (with the exception of portraiture) was the embellishing of books.

About this time a great landscape-painter had arisen, whose works created unusual wonder and admiration. Such skies, such distance, such aerial tints of light and shade emanated from the pencil of J. M. W. Turner, as had never before been seen. The sparkling drawings and vignettes that he produced for book illustrations proved a severe test to the genius of the engraver. Their multitudinous gradations of tints and objects of detail were so varied, that it baffled the attempts of many of the engravers to translate them into the language of the *clair-obscur*, and it was

no small triumph to John Pye when the moment arrived for him to make a successful effort. In 1810, nine years from the time of Mr. Pye's arrival in London, it happened that John Britton selected Turner's picture of 'Pope's Villa at Twickenham,' painted ten years before, for publication in a work he was then bringing out, entitled, 'Fine Arts of the English School.' John Pye was commissioned to engrave it, and when he went with trembling steps to the house of Mr. Turner to show him his first proof, great was his relief when he found the painter from home and was able to leave it for his inspection. Animated with a consciousness of the importance to his professional life of Mr. Turner's judgment, this created some suspense, but it was not of long endurance. A few days afterwards a gentleman of somewhat rough exterior, on horseback, was seen at Mr. Pye's house. It was the great painter. "Oh, this is all right," said Turner, pointing to the proof, "you can see the lights! If I had known any person in the country capable of executing it as you have done, I would have had it engraved before."

From this moment an intimacy sprung up between J. M. W. Turner and John Pye which subsisted more or less through life. Mr. Pye has engraved some of Turner's finest works, and his success in the art has procured for him the honour of being elected a Corresponding Member of the Institute of France. Mr. Pye's largest engravings after Turner are the 'Temple of Jupiter in the Island of Egina,' and the 'Ehrenbreitstein,' both of great merit. The latter picture was painted by Turner at Mr. Pye's request, and when completed, it was sold to Mr. Bicknell. Among other pictures and drawings of Turner engraved by Mr. Pye we may mention especially some beautiful views in Whittaker's 'West Riding of Yorkshire;' his engraving of 'Hardraw Falls' was one which much pleased the painter, and his 'Birthplace of Wickliffe' and 'Junction of the Greator and the Tees.' Two of Mr. Pye's engravings on steel, a small plate of the 'Ehrenbreitstein' after Turner, executed for the 'Literary Souvenir,' and the 'Sunset' of Barrett, are, says a well-known critic recently deceased, "among the most perfect gems of the kind that have ever been produced in this or any other country."

It is now time to speak of Mr. Pye's literary and philanthropic labours in the cause of art. In 1845 he published a volume of

400 closely printed pages, containing a vast amount of historical and gossiping matter, entitled, "Patronage of British Art, an historical sketch, comprising an account of the rise and progress of art and artists in London, from the beginning of the reign of George II., together with a history of the Society for the Management and Distribution of the Artists' Fund, from its establishment in 1810 to its incorporation in 1827, illustrated with notes historical, biographical, and explanatory." Although introduced with the characteristic motto from Barry, "It is presumed that reasonable men look for nothing further than mere information from the writings of artists," the work is an able *résumé* of the subject of which it treats, and is interspersed with some cleverly etched portraits of Mulready, Clint, Warren, Scriven, and others who took part in the management of the Artists' Fund.

The foundation of this admirable institution of provident care, which has always commanded a large share of Mr. Pye's sympathy and support, is thus related by himself.

"In the autumn of 1809, Mr. Scriven, the engraver, attracted by the sufferings of an aged brother engraver, Mr. Tagg, reduced by epilepsy, paralysis, and poverty to a state of destitution, used to wend his way, from his residence at Somers Town, across the busy city, alone and unheeded, to Kennington, to solace affliction. One of Mr. Scriven's visits having been made at a moment when Mr. Tagg's landlord threatened to seize for rent the bed on which he lay, and when Mr. Pollard, the engraver, happened also to be visiting the abode of wretchedness, these two gentlemen embarked together in an effort to mitigate the calamity they had witnessed. They forthwith stayed the landlord's proceedings, and met again, accompanied by a few of their friends, at the Gray's Inn Coffee-house, in furtherance of their purpose. At that meeting a subscription of one guinea each was commenced, and a resolution was taken to endeavour, by making known throughout the profession the facts which had led to the meeting, to awaken generally that sympathy by which a few had become animated. Mr. Scriven acted as secretary, wrote letters of appeal, called another more general meeting,—in a word, Mr. Scriven was the great mover of the honourable purpose, and the result proved the willingness of those, to whom the tragic tale was told, to do good, unaided by the reward of public display, for at the next meeting the subscrip-

tion amounted to £53. 2*s*. It was then resolved to offer to the creditors of Mr. Tagg, from that sum, a composition in liquidation of his debts, which, in full, amounted to about eighty pounds; and a committee was appointed to give practical effect to the resolution; but at the moment thus much of the good work was accomplished poor Tagg died."

Out of this arose "The Artists' Incorporated Annuity Fund," in which Mr. Pye took so much interest, and by the members of which he was in 1830 presented with a Testimonial in the form of a handsome silver antique urn.

In addition to being elected a Corresponding Member of the Institute of France, Mr. Pye was awarded a Gold Medal by the Government of Louis Philippe, and he is an Honorary Member of the Imperial Academy of Arts of St. Petersburg.

DR. HOOKER, V.P.R.S., F.L.S., ETC.

ASSISTANT-DIRECTOR OF THE ROYAL GARDENS, KEW.

Joseph Dalton Hooker, son of Sir W. J. Hooker, Director of the Royal Gardens, Kew, was born at Halesworth, Suffolk, on the 30th of June, 1817. His father having in 1820 accepted the Chair of Regius Professor of Botany in the University of Glasgow, his early life was entirely spent in that city. He was educated at the High School and University, following up the usual curriculum with the study of medicine, but having imbibed from childhood a strong predilection for natural-history pursuits, collecting and examining, as opportunity offered, plants, minerals, and insects, his interest in such subjects was largely increased by the society which he met at his father's house. The rooms of Prof. Hooker at Glasgow were frequently the resort of scientific travellers, especially those engaged in arctic exploration. Among the associates of Dr. Hooker's youth were Franklin, Parry, Ross, Richardson, and indeed travellers from all parts of the world. Hence the reading of books of travel became a passion with him, and at the age of twenty-two he accompanied, officially as Assistant-Surgeon, but in reality as Naturalist, the famous expedition of Sir James Clark Ross, fitted out by the Government for the purpose of investigating the phenomena of terrestrial magnetism in the south circumpolar seas. It was on the 29th of September, 1839, that the 'Erebus' and 'Terror,' the same vessels which, on their return home, conveyed poor Franklin to his last resting-place in the opposite hemisphere, sailed from Chatham. The officers of the expedition were enjoined to use every exertion to collect objects of natural history, and so actively did Joseph Hooker avail himself of the opportunities afforded by his visits to the various antarctic islands, in addition to those in the vicinity of the Australian continent, that a grant of £1000 was awarded

by the Government to assist in the description and publication of his collected specimens. During three cruises in the south polar regions, the expedition visited Lord Auckland and Campbell's Islands, Kerguelen's Land, Fuegia and the Falkland Islands, often battling with the pack-ice in a terrific surf, or amid blinding snow-storms; while important visits were made to New Zealand and Tasmania. The botanical results of this adventurous voyage, worked out by Dr. Hooker in a manner quite unprecedented for its picturesque and philosophical detail, were published in six quarto volumes of closely-printed pages, illustrated with 500 coloured plates.

On the return of Dr. Hooker to England, after an absence of rather more than three years, he found his father installed at Kew as Director of the Royal Gardens. The describing of his plants, coupled with the arduous duty of collating his specimens with those collected by previous voyagers, preserved in the herbarium of the British Museum, occupied the principal share of his attention until 1846, when he accepted the appointment of Botanist to the Geological Survey. His researches in connection with the duties of this office were directed more especially to the coal plants, and he contributed some valuable papers on the subject to the publications of that institution.

It is proverbial that when a man of scientific research has once tasted the pleasures of foreign discovery, his thirst for novelty is not easily satisfied. Dr. Hooker having acquired a knowledge of the botany of the temperate zones, now felt a desire to explore that of the tropics. In 1847 the adventures of Sir James Brooke excited a great deal of interest in Borneo, and the Government were sanguine enough to think that the island might be made an emporium of British commerce. Coal was reported to exist at Labuan, and Dr. Hooker was invited by the Government to examine and report upon the capabilities of Borneo for cultivation. Being unacquainted with East Indian tropical productions, he obtained permission to qualify himself for the work by first visiting India. Partly at the expense of the Office of Woods and Forests, but chiefly from his own and his father's resources, he undertook an important botanical mission to the Sikkim and Nepal Himalayas; his chief object being to collect facts for a geographical distribution of plants. He sent home rich collections both of dried and living plants, amongst the latter of which must especially be

mentioned a magnificent series of new Rhododendrons, which now form conspicuous ornaments of our gardens and greenhouses. From drawings and specimens of these, transmitted by him to England, Sir William Hooker edited a superb folio volume, entitled 'Rhododendrons of the Sikkim-Himalaya.'

His Sikkim explorations were not unattended by adventure; for after lingering for some months amongst the mountains, he was joined by Dr. Campbell, the political resident at Darjeeling. Together they crossed the jealously-guarded frontier of Tibet, remaining two days on the forbidden grounds north of the snowy range. On their return into Sikkim, the natives of that country, with the short-sighted policy of semi-civilized people, seized and threw them into prison, thinking thus to extort a more favourable treaty from Dr. Campbell. For six weeks they were detained; after which their return to Darjeeling was connived at, the natives being dismayed at the intelligence that an English force was advancing to their rescue.

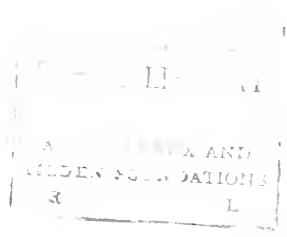
According to the original plan, Dr. Hooker should now have proceeded to Borneo; but by this time that country had become unpopular with the Government, and reports of the unhealthy state of its coast having excited some alarm, the Malayan survey was abandoned, and Dr. Hooker obtained leave to devote the additional time intended for that service to an expedition to the Khasia mountains, in company with Dr. Thomson, H.E.I.C.S.

Dr. Hooker returned to England in 1851, and two years afterwards published a narrative of his expedition, under the title of 'Himalayan Journals, or Notes of a Naturalist in Bengal, the Sikkim and Nepal Himalaya, the Khasia Mountains, etc.'

In 1856, the botanical establishment at Kew, with its museums, herbarium, and library, had so largely increased, that an appointment was created for him under his father as Assistant-Director, and that admirably-managed institution has since that period had the benefit of his services. Dr. Hooker is a Vice-President of the Royal and Linnean Societies, and it is in the Transactions of these Societies, especially the latter, that his principal botanical papers have been published. His most important work is a new 'Genera Plantarum,' written in conjunction with Mr. Bentham, on the plan of Endlicher's famous work, of which the first Part appeared in 1862. He is also one of the authors engaged in the preparation

of a valuable series of the Floras of the British Colonies, now publishing under the authority of the Government.

Dr. Hooker married, in 1851, the eldest daughter of the Rev. J. S. Henslow, the late Professor of Botany in the University of Cambridge.



JOHN OBADIAH WESTWOOD, M.A., F.L.S.

John Obadiah Westwood was born at Sheffield, on the 22nd December, 1805. His father was an ingenious manufacturer in that town, having been originally brought up as an engraver, which profession he subsequently extended in various directions, including the embossing of wood, ivory (for which latter he obtained a patent), paper, cardboard, etc., the manufacture of buhl-work, medal and coin engraving,* the making of pill-boxes from deal shavings,† etc. As an artist he used to boast that he was the first to discover the talents of Chantrey, the celebrated sculptor, then an apprentice to a carver and gilder in Sheffield, and that he first placed a modelling-stick and wax in his hands. The artistic talents of the father influenced the taste of his only son, the subject of this notice, whilst the scientific character of his schoolmaster, Mr. J. H. Abraham, F.R.S.,‡ of Sheffield, widely known as an excellent lecturer and practitioner of experimental science, gave a scientific

* The father engraved many of the dies for the local tokens, which were in such extensive circulation all over the kingdom at the beginning of the present century, and the collection of which by amateurs became a subsequent mania. The last token which he issued was a satirical one, the obverse representing a collector of these coins seated at a table with a figure standing behind him placing a fool's-cap on his head, whilst on the reverse were a couple of donkeys, ridden by sweeps, with the inscription, "Asses running for half-pence." Very few copies of this token were issued, but the collectors bought them up at very high prices.

† This idea was borrowed from the Dutch, but Mr. Westwood significantly embossed the word "Faith" on the lids of his boxes, which had a vast sale, but which were subsequently beaten out of the market by the cardboard boxes still in use.

‡ Mr. Abraham was the inventor of a small magnetic instrument to protect the mouths of the Sheffield working-cutlers from imbibing the steel filings produced in grinding processes, which had proved detrimental to their lives to a very great extent.

direction to his mind, to which the gift of a small microscope, ever since in daily use, materially contributed. The latter part of his education was acquired at the grammar school of Lichfield, to which city his family had removed in 1819, where the beautiful cathedral of St. Chad failed not to attract his attention to the charms of religious architecture and art, whilst a small collection of insects, formed by a relative at Demerara, on the river Essequibo, in British Guiana, and an acquaintance with Dr. Wright, of Lichfield, who possessed, amongst the remnants of the famous museum of Dr. Green, of that city, a fine case of insects (subsequently purchased in 1821 by Mr. Westwood), invited his attention to the examination of the peculiarities of the insect-world, for which he has subsequently become renowned.

But sterner duties of life now arose, and on removing to London he was articled to a legal firm in the City, in 1821, where he served the five years of his clerkship, on the completion of which he was admitted a partner in the firm, and continued to practise as an attorney for several years; entomology, however, proved too strong for special pleading and conveyancing, and he shortly relinquished the legal profession and devoted himself entirely to his favourite pursuit.

For some time the collecting of British insects of all orders formed the main subject of his pursuit, and, as he resided at Chelsea, Coomb Wood, Wimbledon Common, Battersea Fields (now covered with railroads), and the adjacent parts, formed the especial localities where he employed his entomological net. From the first, however, his attention was directed to the economy and structure of insects, and he eagerly studied and made copious abstracts from the works of Kirby, Spence, Leach, Rösel, De Geer, and especially of the 'Règne Animal,' of which the first edition appeared in 1817. He has often remarked that the characters of scientific persons seem especially to be influenced by the character of the works most in vogue at the time of their entrance on scientific pursuits; for example, as occurred about the year 1810, the works of Marsham and Haworth were recently published. These were almost exclusively confined to technical descriptions, whence arose a school of descriptive entomologists, including Curtis, Leach, and Stephens. The last-named author never rose beyond the rank of a describer of species, whereas Curtis, from having deeply studied the 'Genera Crustaceorum et Insectorum' of Latreille, as appears from

his recently-published biography (contributed by Mr. Westwood to the 'Annales' of the French Entomological Society), added to his *specific* details a love of *generic* forms which resulted in the publication of his magnificent work on British Entomology.

Whilst resident at Chelsea he formed the acquaintance of Mr. Haworth, whom he was in the habit of regarding as his entomological tutor, and who liberally opened his cabinets to the young entomologist, who was thus enabled to delineate a great number of remarkable exotic genera of various orders. To the celebrated work by Macleay, 'Horæ Entomologicæ,' and the third and fourth volumes of the 'Introduction to Entomology,' by Kirby and Spence, Mr. Westwood was also greatly indebted for the direction which his mind more especially took in entomological science.

Mr. Westwood's first entomological communication was published in the 'Literary Gazette,' of 24th March, 1827, announcing the capture of two very remarkable species of Hymenopterous insects, for the first time in this country. This was followed, in the same year, by a memoir on the family Staphylinidæ, published in the 'Zoological Journal,' to which work, as well as to 'Loudon's Magazine of Natural History,' the 'Entomological Magazine,' the Transactions of the Linnean Society, the 'Annales' of the French Entomological Society, and the Transactions of the Entomological Society of London, Mr. Westwood contributed a very extensive series of memoirs on almost every branch of entomological science.

Having long perceived the want of a work of a character intermediate between such general treatises as Kirby and Spence's 'Introduction to Entomology,' and works consisting mainly of descriptions of species, Mr. Westwood planned a work upon the families of insects, arranged systematically, and under each family he proposed to arrange the vast mass of facts relative to their structure, economy, transformations, etc., dispersed through the publications of scientific societies. This laborious task occupied many years' research, and resulted in the publication of 'An Introduction to the Modern Classification of Insects, founded on the Natural Habits and corresponding Organization of the different Families,' in two thick octavo volumes, in the years 1839–40. The many hundred figures of structural details illustrating this work were drawn by the author.

Mr. Westwood subsequently published an extensive series of

entomological articles in Partington's 'Encyclopædia,' and a small entomological Text-book; also a work, in two volumes octavo, containing descriptions and figures of new and remarkable exotic insects, under the title of 'Arcana Entomologica,' 1841–5, with ninety-six plates; a handsome quarto volume devoted to Indian insects, entitled the 'Cabinet of Oriental Entomology,' with forty-two plates, 1848; also a work, in three volumes quarto, on 'British Butterflies and Moths;' as well as the greater portion of the folio work on the 'Genera of Diurnal Lepidoptera,' commenced by the late Mr. Edward Doubleday. Of all these works, except the two last-mentioned, the numerous illustrations were entirely executed by the author, who also lent his assistance in drawing and dissecting insects for the illustration of memoirs published by several of his entomological friends. A tolerably complete list of Mr. Westwood's entomological writings was published by Dr. Hagen in the 'Bibliotheca Entomologica,' 1863, extending to 379 articles, and occupying sixteen pages.

On the 1st May, 1827, Mr. Westwood was elected a Fellow of the Linnean Society of London, and shortly after the establishment of the Entomological Society, he accepted the honorary office of Secretary to the Society, of which he performed the duties for fourteen years. In 1833 he became a Member of the Entomological Society of Paris, and on the death of Humboldt in 1860 he was elected one of the four foreign Honorary Members of the same Society. Many other societies of natural history, at home, on the Continent, and in America, have also elected him an Honorary or Corresponding Member.

On the 30th November, 1855, the Royal Gold Medal was awarded to him by the Royal Society, and on the 6th of May, 1858, the University of Oxford conferred on him the honorary degree of M.A.; at the latter period he had removed to Oxford, and had undertaken the keepership of the large collections of natural history (especially entomology), fine arts, and books, presented to the University by the late Rev. F. W. Hope; and on the foundation by that gentleman of a professorship of zoology at Oxford, he he was appointed Professor and took up the ordinary Master's degree.

The taste for Christian archæology inspired in the mind of Mr. Westwood during his residence at Lichfield, had not been allowed to lie dormant, and the fine English works of Strutt, Dibdin, Shaw, and Astle, and the foreign ones of D'Agincourt, Willemin,

Du Sommérard, and Langlois, gave it a direction towards the study of illuminated manuscripts, whilst the introduction of chromolithography offered facilities for the publication of works on that subject not previously existing. The works of Dibdin and Strutt had, it is true, been confined to the representation of the more artistic portion of these precious relics of bygone days, whilst Astle had confined his work to their palæographic character. The noble works of Count Bastard and Sylvestre* proved, however, how attractive the union of these two portions of the subject might be made, and this led to the publication, by Mr. Westwood, in the years 1843–1845, of the 'Palæographia Sacra Pictoria; being a series of illustrations of the Ancient Versions of the Bible, copied from illuminated manuscripts executed between the fourth and sixteenth centuries.' In this work, consisting of fifty quarto plates, printed in gold and colours, the author endeavoured to show that in all ages versions of the Scripture have been made in the mother-tongue of almost every nation; and also, in a more especial manner than had been previously done, to exhibit the distinctions of the very remarkable styles of Anglo-Saxon and Irish art; with this view not fewer than twenty plates were devoted to our early manuscripts, amongst which, for the first time, the magnificent 'Book of Kells,' of Trinity College, Dublin—the most elaborate manuscript ever executed in these islands—was brought before the notice of the public. The whole of the drawings and plates of this work were executed by the author.

This work was followed in 1846 by the 'Illuminated Illustrations of the Bible, copied from Select MSS. of the Middle Ages,' published in small quarto, and comprising forty plates, illustrating subjects of Biblical history.

Since the publication of these works Mr. Westwood has continued his investigations of the artistic peculiarities of Anglo-Saxon and Irish Manuscripts preserved in all the principal libraries of England and the Continent, the results of which will be shortly given to the public in a work now in the press, entitled 'The Miniatures and Ornaments of Anglo-Saxon and Irish Manuscripts,' illustrated in fifty plates, imperial folio size.

The remarkable and interesting analogy existing between

* Of the 'Paléographie universelle' of Sylvestre, edited by Champollion, Mr. Westwood's translation of the entire text was published in 1850, with additional notes by Sir F. Madden, by Mr. H. Bohn.

these early manuscripts and the numerous sculptured stone pillars found in many parts of our islands, to which the name of Runic Crosses has, in many instances, been misapplied, early attracted the notice of Mr. Westwood, and led to his undertaking many journeys and pedestrian excursions in search of such stone monuments, especially in various parts of Wales, where he has been rewarded by the discovery of a considerable number of Romano-British and early Christian memorials, previously unpublished, of which he has, from time to time, given notices, with figures in the pages of the 'Archæologia Cambrensis.' His extensive collection of rubbings and drawings of this class of monuments contain a considerable number of still unpublished remains.

The value of another interesting source of illustrations of early Christian art, which had been previously greatly neglected, was early appreciated by Mr. Westwood. The carved ivory diptychs, triptychs, and other similar works, which had been in use as objects of devotion from an early period, but which, except in the great work of Gorius, had received but little attention from archæologists, supplied an important link in art, scarcely any stone sculptures executed from the fifth to the fifteenth century being in existence abroad, whilst these small objects (from the almost indestructible material of which they are composed, and its comparatively slight value, the workmanship alone rendering it of importance) had been in use during the whole of the Middle Age period. These objects likewise afford great facilities to the copyist, since casts in plaster of Paris may easily be made from them, which, treated with stearine, so closely resemble the original ivory carvings as to deceive an ordinary observer. Of such casts Mr. Westwood now possesses more than a thousand examples, ranging from the period of the Assyrian monarchy to the end of the seventeenth century. Various memoirs on the subject of these ivories have, from time to time, been published by Mr. Westwood in the 'Literary Gazette,' 'Gentleman's Magazine,' and the 'Stereoscopic Magazine.'

Numerous other memoirs on archæological subjects have been contributed by Mr. Westwood to the 'Journal of the Archæological Institute,' the 'Archæologia Cambrensis,' etc.

ALEX. J. BERESFORD BERESFORD-HOPE,

LL.D. CAMB., D.C.L. OXON., ETC.

THERE are few persons who have more eminently distinguished themselves in promoting the revival of the glorious architecture of the middle ages in this country than the subject of our present memoir. The zeal of Mr. Hope in eliciting improved designs for the erection and decoration of churches has been exhibited in several splendid examples of ecclesiological taste, while he has occupied himself with spirit and public advantage for some years past, both in politics and literature.

Alexander James Beresford Beresford-Hope, born January 25th, 1820, is the youngest son of the late Thomas Hope, Esq., of Deepdene, near Dorking, Surrey, author of 'Anastasius,' by Louisa, youngest daughter of William De La Poer Beresford, Archbishop of Tuam and Baron Decies, son of the first Earl of Tyrone, who re-married Marshal Beresford. His father belonged to the renowned banking-house of the same name of Amsterdam, having returned to this country during the time of the French Revolution. Mr. Beresford-Hope was educated at Harrow, where he gained a scholarship and several prizes. From Harrow he went, in 1837, to Trinity College, Cambridge, where, in 1841 and 1844, he took his degrees of B.A. and M.A., having gained the English and Latin Declamation prizes in College and the Members' prize for the Latin essay in the University.

Mr. Hope's political career began at an early age. He was elected Member for Maidstone in 1841 and again in 1847, the latter time without a contest, and he sat continuously for that borough until 1852. Again he sat for Maidstone from 1857 to 1859. In 1859, Mr. Hope stood for the University of Cambridge, but, at the suggestion of several leading friends, he retired, on a private reference, rather than a poll in favour of Mr. Selwyn,

who came in apparently without opposition. In 1862 he contested Stoke-upon-Trent, but was not successful. Mr. Hope entered public life as a Conservative, and opposed the Repeal of the Corn Laws. He did this, however, not so much from a feeling of opposition to Free Trade, as from a belief that Sir Robert Peel ought previously to have appealed to the country. He was much dissatisfied with the conduct of all parties at that time, and has since professed himself a Liberal Conservative. One of the most important votes given by Mr. Hope during his parliamentary career was against the Ecclesiastical Titles Bill, and he was one of the ninety-nine who voted against the Conspiracy for Murder Bill, which, it may be remembered, arose out of the Orsini affair in Paris.

Mr. Hope has taken a warm interest in Church questions, always expressing himself a decided, though not extreme High Churchman. As such he has taken an active part in many Church societies. In cooperation with his friend the Rev. E. Coleridge, he was largely instrumental in that great and useful work of converting the remains of St. Augustine's Abbey, Canterbury, into a Missionary College for ministers of the Church of England. It was opened by Archbishop Sumner, under the title of St. Augustine's College, on the 29th of June, 1848. Mr. Hope has devoted much attention to art, especially architecture, and is well known as a leader of the Gothic School. He is President of the Ecclesiological Society, for the study and advancement of ecclesiastical art; and he is also President of the Architectural Museum, an institution specially intended for the improved artistic education of the art-workman, whose cause he pleaded before the Royal Academy Commission. Among architectural works of a high order in the erection and decoration of which Mr. Hope has taken a conspicuous interest, we may mention, in addition to St. Augustine's College, Canterbury, the beautiful church of All Saints, Margaret Street, Cavendish Square, London, of which Mr. Butterfield was the architect, and in which there are some fine fresco paintings by the late Mr. Dyce, R.A., and other artists. One of the choicest examples of Mr. Hope's taste in ecclesiological matters may be seen in the church of Kiuldown, near his seat of Bedgebury, Kent. In 1842 he filled the windows of this edifice with painted glass from the late King of Bavaria's manufactory at Munich. It was the first seen in this country, and the

re-fitting of the church was ably carried out by Mr. Carpenter, an architect of great promise, since deceased.

As an author, Mr. Hope is chiefly known by his 'English Cathedrals of the Nineteenth Century,' published by Murray, in 1860. The work embodies an ideal description of a cathedral, viewed both as a building and as an institution for the service of the Church of England, and it is put forth as representing the type of what the author thinks it ought to be. Mr. Hope has also published several pamphlets, lectures, papers, and addresses, some political, others delivered before literary and scientific societies, chiefly on art questions. Among his anonymous contributions to literature may be mentioned articles in the 'Saturday Review,' which journal he mainly helped to establish, the 'Quarterly Review,' the 'Christian Remembrancer,' and other similar periodicals, and he is the reputed author of a series of letters on the subject of the Papal aggression and of church questions in general, which appeared in the 'Morning Chronicle,' from 1850 to 1854, and were published subsequently in a collected form, under the title of 'Letters on Church Matters, by D. C. L.' Mr. Hope has taken a warm interest in the American disruption, and has published several lectures on the subject of this unhappy strife. He was one of the first public men in this country to declare openly for the South, and is Chairman of the Southern Independence Association of London. We may also mention here, while recurring to Mr. Hope's political career, that he was Chairman of the Association which carried the Repeal of the Hop Duties.

The direction of Mr. Hope's taste and pursuits in the cultivation of ecclesiological art and antiquities may be gathered, in addition to the foregoing remarks, from the circumstance of his being a Fellow of the Society of Antiquaries, and Honorary Fellow of the Institute of British Architects. He possesses a fine collection of old books and pictures, and some curious articles of mediæval and Renaissance date, among which may be mentioned a valuable sardonyx jewelled and enamelled ewer, attributed to Cellini, formerly in the possession of the French Crown, now exhibited in the Museum of South Kensington.

On the death of his relative and stepfather, Marshal Beresford, in 1854, the title having become extinct, Mr. Hope prefixed the name of Beresford to his own by royal licence, in memory of the deceased Viscount and of his mother, and inherited the pro-

perties of Bedgebury Park, Kent, and Beresford Hall, Staffordshire. This latter seat, belonging originally to the Beresford family, passed, in the seventeenth century, into the possession of the renowned poet and angler Charles Cotton. Here Cotton and his friend Izaak Walton fished, and here many of the scenes described in their 'Complete Angler' were derived. The property was repurchased by Lord Beresford in 1824. Mr. Hope married, in 1842 Lady Mildred Gascoyne-Cecil, eldest daughter of the Marquis of Salisbury, and has living eight daughters and two sons.

MATTHEW FONTAINE MAURY.

Matthew Fontaine Maury, fourth son of Richard Maury, a farmer in Virginia, was born on the 14th of January, 1806, in Spottsylvania County,—a county memorable henceforth in American history as the scene of "Stonewall" Jackson's dashing flank attack on Hooker at Chancellorsville, when the Southern hero fell in the moment of victory; and also as the battle-ground of some of the fiercest contests known to modern times between the Confederate and Federal Generals, Lee and Grant.

In 1810, Mr. Richard Maury emigrated to Tennessee, settling near Franklin, a village in Williamson County, about eighteen miles south of Nashville. It was here, amid the noble forests of this fine State, at a time when the Indian and the bear disputed the advance of civilization, that the subject of our memoir passed his early youth. The habits of frontier life, developing a perception naturally keen, soon laid the foundation of that accuracy of observation which has ever been one of his distinguishing characteristics. The starry firmament on a clear night, and the mossy side of the forest oak in darkness or snowdrift, serving as the only guide through the trackless woods, indicate the kind of training to which the physical geographer of the sea has been often heard to ascribe much of his success in the wide and intricate fields of his subsequent researches.

After acquiring such rudimentary knowledge as the schools of his adopted State were at that time capable of imparting, Maury was sent, in his sixteenth year, to the Harpeth Academy. Here his powers of application and thirst for knowledge became so conspicuous, that the Rev. James H. Otey—subsequently Bishop of Tennessee, but at that time Head Master of the Academy—con-

ceived an attachment for him, which gradually ripened into close and lasting friendship.

In the year 1825 he left the Academy and entered the United States' Navy; and, as at that time the schoolmaster was not afloat, a young midshipman left to his own resources was not long in discovering that study in the cockpit of a man-of-war was far more difficult than in the wilds of Tennessee. Indomitable perseverance, however, carried young Maury, as it has carried many other men, young and old, through the greatest difficulties. Anecdotes are related by his contemporaries of the strenuous and successful efforts he made to perfect himself in the theory as well as the practice of his profession, such as working out problems of spherical trigonometry with diagrams chalked on the round shot in the quarter-deck racks, and placed so that he might see them while pacing the deck in the quiet moments of his watch. But perhaps the greatest force of character was shown in the method he adopted to acquire the knowledge of navigation. Having procured an old Spanish book on the subject, he set to work, and, by the aid of a dictionary "killed," to use his own expression, "two birds with one stone,"—learning a science and a language at the same time. Yet, notwithstanding his studious habits, Midshipman Maury had the reputation of being a most attentive officer to the minutest detail of duty, and the general estimation in which he was held appears from the fact of his being constantly selected for any particular service out of the ordinary routine, and especially for the rating of the chronometer,—an instrument at that time just coming into use in the American navy, conducting harbour surveys, the collecting of commercial and other statistics, etc.

In the United States' frigate 'Brandywine,' during the autumn of 1825, the young sailor visited Cowes, in the Isle of Wight. Here he made a grand addition to his slender library in the purchase of a 'Norie's Epitome of Navigation.' But the outlay all but exhausted his funds, for the pay of an American midshipman at that period amounted only to £3. 8*s*. 1*d*. per month, out of which Maury allotted £1. 17*s*. a month to one of his sisters. The remaining £1. 11*s*. 1*d*., after discharging his mess-bill and washing-bill, replenishing his wardrobe, and meeting sundry other necessary expenses, left so fractional an overplus, that our young officer was unable to visit any places of interest during the stay

of the frigate in English water. In 1826 the 'Brandywine' returned to New York after a cruise round the Mediterranean, and, having been refitted for three years' service, sailed for the Pacific as the flag-ship of the squadron on that station. From the 'Brandywine' Mr. Maury was transferred to the 'Vincennes' sloop-of-war, then engaged on a voyage of circumnavigation.

The change from the close and crowded steerage of the frigate to the comparatively well-ventilated and roomy mess of the 'Vincennes,' proved a great gain to Mr. Maury, and enabled him to make rapid strides in knowledge. During his service in this ship he nearly completed a set of lunar tables, but, on his return home, found, to his mortification, that the idea had been anticipated; and the tables were consequently useless.

The 'Vincennes' was paid off in 1830, and Mr. Maury was at once offered the appointment of Master in another vessel. He however preferred remaining at home until that great ordeal to a young sea-officer, his examinations, had been passed,—it is needless to say, in his case, successfully and creditably.

Mr. Maury's next appointment, 1831, was as Master to another sloop of war, the 'Falmouth,' ordered to the Pacific station. It was while performing the first section of this voyage, viz. to Rio Janeiro, that he conceived the idea of his celebrated wind and current charts. He was naturally anxious, in this his first great responsibility as a navigator, to make a quick passage, and before leaving New York, had tried in every direction to obtain authentic information as to the best route to be taken,—the winds and currents to be encountered by the way, etc.; but it was soon painfully evident to him, that no such information was to be found in the nautical works of the day. He determined to supply the want, and proposed to the chart agents to construct a chart, showing the daily nature of the weather, clearly marked on the routes to the principal ports of the world.

In the 'Falmouth' he had a cabin to himself; and, in addition to his own scanty stock of literature, there happened to be a large store of books on board, the property of a wealthier messmate. Mr. Maury, forgetting the proverb, "When fortune fills your sail with more than a propitious gale take half your canvas in," indulged so freely in the perusal of Sir Walter Scott's novels (a style of reading quite new to him) as to find it difficult indeed to return to the hard dry studies of his profession.

On this voyage his attention was directed to the curious phenomenon of the low barometer off Cape Horn, and upon this subject he wrote his first contribution to science; the paper was published in the 'American Journal of Science.' Subsequently, from the countless observations sent to him, much additional light was thrown upon the subject, proving that the mean height of the barometer, instead of being nearly 30·00, is in these latitudes ess than 29·00,—or, in other words, showing that there is not so much atmosphere, by about one-tenth, within the Antarctic as within the Arctic Circle. With this clue, and from his own personal observations on the nature of atmospheric changes in the Antarctic regions, Mr. Maury was able to theorize on the physical geography of that part of the world, and his predictions have been amply verified by exploring expeditions, since sent to those regions.

During the cruise of the 'Falmouth,' Mr. Maury devoted his leisure time to preparing for the press a work on navigation, which, on his return, was published in Philadelphia, under the title of 'Maury's Navigation;' and, in spite of the jokes levelled by the old commodores and naval officials of that day, against a passed midshipman writing a book, it speedily came into favourable notice; and, upon the founding of the Naval School at Annapolis, it was made the text-book for the Navy.

From the 'Falmouth' he was transferred to the schooner 'Dolphin,' and did the duty of First Lieutenant for some time. He then joined the frigate 'Potomac,' returning in that ship to the United States, in 1834. When paid off at Boston, he found himself free to visit his native State. During his stay there he was married to Miss Anne Herndon, his present wife, to whom he had been engaged nine years,—his pay at that time, as passed midshipman, amounting to merely £8. 5*s.* 3½*d.* per month.

Soon after his marriage, the American exploring expedition was fitted out, and Mr. Maury was selected for the appointment of astronomer, and also offered that of hydrographer. After many delays—chiefly owing to the inability of the Government to find a captain fitted for such a service, Lieutenant Wilkes (since of 'Trent' notoriety) was appointed to command the expedition, on the ground of his having made a chart of George's Shoal; but, as soon as this became known, Mr. Maury requested to be placed on furlough, which was granted, and the expedition sailed without him.

In 1837 Mr. Maury, after twelve years' service, received his well-merited promotion to the rank of Lieutenant.

During this leisure from professional pursuits, Lieutenant Maury was not idle, but directed his attention to the improving and reforming the navy. Under the quaint title of 'Scraps from the Lucky Bag,' he wrote a series of articles on the subject, urging especially the establishment of a naval school, and the breaking up of the effete Board of Navy Commissioners, the pressure of which upon the maritime resources of the nation was then precisely the same as that now experienced from the Board of Admiralty in this country. He proposed to substitute for it the bureau system, with individual accountability on the part of the chief of each bureau, instead of a joint responsibility with no one to blame, as with the members of a board. He also proposed other improvements, such as the construction of certain railways and canals, coast-harbour defences, the adoption in America of the warehousing system of England, and the establishment of a dockyard on the Mississippi, etc., all of which were adopted by the Government or people, and approved by Congress. The lead he thus took in all measures calculated to develope the resources of his country, to increase its strength, or to benefit its commerce, attracted the favourable attention of his countrymen, and gave his opinions weight and influence with them.

In 1839 he had the misfortune to break his right leg at the knee-joint, which compelled him to use crutches for several years, and made him a cripple for life, destroying all his cherished naval aspirations. After his recovery he gave himself up to literary pursuits, and first became the editor of the 'Southern Literary Messenger,' the leading journal in the South, and the only one of its kind which has lived through a generation; it is still published at Richmond.

In 1842 Lieutenant Maury accepted the appointment of Superintendent of the Depôt for Charts and Instruments at Washington, which in due course, under his management, expanded into the National Observatory and Hydrographical Department of the United States; and here also the opportunity offered of carrying out the cherished ideas of 1831, concerning the construction of charts to show the winds and currents actually encountered by navigators. Lieutenant Maury's first work was to examine the official logbooks, which had been hidden in the cellars of the

department since the establishment of the American Navy. After much labour a quantity of valuable data was extracted, and in spite of many drawbacks, the first chart of the series was produced,—it related to the voyage between the United States and Rio de Janeiro,—but prejudice was strong against its use, and the fear that, by departing from the regular track, the insurance would be lost in case of disaster, caused some time to elapse before any captain could be induced to look at the "new-fangled" plans. At length Captain Jackson, commanding the 'W. H. D. C. Wright,' of Baltimore, consented to make the trial, and he made the voyage out and home in the time often taken by old traders on the outward passage alone.

"Nothing succeeds like success," and after this there was no lack of applicants for the new chart. Its author then drew up the form for a log containing columns for the points most useful in aiding his investigations, and he invited all American masters of foreign-going ships to co-operate with him in accumulating data; and to all who acceded to his wishes presents of charts as they were produced were made. Thus a legion of ships were soon converted into floating observatories, and their officers into zealous co-operators, by whose means an immense mass of information was speedily collected.

Every day the benefit of the new order of things became more and more apparent; and, as soon as his system was firmly established, Lieutenant Maury obtained the consent of his Government to invite the co-operation of the maritime European Powers in the establishment of a general system of meteorological research, and to offer, without charge for their public vessels, sets of the charts and sailing-directions, and, at the same time, to place at their disposal (also without charge) as many copies of the publication as they chose to demand for distribution in the merchant marine, on the sole condition that the merchant-captains receiving them should keep a journal in the prescribed form, and forward it to Washington, or to Admiral Fitzroy's office in London, properly filled up, at the close of each voyage. The benefits of this great work were thus thrown open to the whole world.

To give some idea of the cost of this undertaking, it may be mentioned that the outlay on account of paper and printing for a single set of Maury's "Wind and Current Charts," and the Sailing Directions which accompany them, amounted to as much as $\$40 = £8$.

To further the thorough carrying out of his ideas, and to divest the plan of even the semblance of exclusiveness, Lieutenant Maury originated the idea of a conference on the part of all nations to settle the form of journal, propose improvements, make suggestions, and otherwise advance the great object in view. This led to the Maritime Conference held at Brussels in 1853. At this reunion of nautical science England, France, Russia, Portugal, Belgium, Holland, Denmark, Norway, and Sweden were represented. England, Holland, and Russia immediately agreed to establish offices to co-operate in Lieutenant Maury's system of research, and their example was soon followed more or less closely by France, Spain, Portugal, Denmark, Sweden, and Prussia. Hence the establishment in London of the Meteorological Department of the Board of Trade, over which Admiral Fitzroy now presides.

Although not yet extended "from the sea to the land, so as to make the system universal," according to the original idea of its founder, many important and interesting discoveries have resulted from the system of research thus instituted, partial as it is; indeed, the great philosopher Von Humboldt declared that Lieutenant Maury deserved the credit of having founded a new department of human knowledge, and which that Nestor of science himself named the "*Physical Geography of the Sea*;" and, in a work with that title, Lieutenant Maury laid before the world some of the most interesting results of his researches.

The new theory of the circulation of both sea and air is peculiarly valuable and conclusive. The author divides the currents into two classes, the occasional and the constant; the former are caused by the winds and other transient agencies; the latter (as the Gulf-stream) are due to perpetually recurring natural causes, such as the alternations of heat and cold, changes in the degree of saltness in sea-water, which continually varies in density, and thereby producing constant change of specific gravity. For example, the waters of the Gulf of Mexico are proved to be both warmer and salter than those further north into which the Gulf-stream flows, and from which there issues a return current bearing the cold water of the Arctic Ocean into tropical seas, there to be heated and drawn into the Gulf-stream in the constant round of oceanic circulation. It is to the difference of specific gravity, resulting from the action of evaporation and precipitation

upon the water of the Gulf of Mexico and of the Arctic Ocean, that the perpetual flow of the Gulf-stream is mainly due.

That "river in the ocean" is in a state of unstable equilibrium. In the force of its current we behold the ceaseless effort of the sea to restore the equilibrium of repose to its waters, while nature is as ceaselessly engaged in disturbing it. But it is quite impossible, in the narrow space of a biographical sketch, to give more than a very faint idea of the magnitude and value of Lieutenant Maury's scientific deductions. 'The Physical Geography of the Sea' must be read; it contains a summary of the greatest number of facts relating to the physics of the ocean ever brought together.

Perhaps the most remarkable result of these observations was the proving to demonstration that the mouths of the Amazon and Mississippi are at the same place, at least for all practical purposes of commerce, as far as sailing ships are concerned. They are not where those rivers enter the sea, but they are in and off the Straits of Florida; for the fact is now established, that in consequence of the winds and currents which beset vessels under canvas as they come out of the Amazon, the best route for all, whether bound for Europe or for any port beyond either of the stormy Capes, leads off to the northward and westward, and passes through those latitudes where the waters of the Mississippi, coming out of the Gulf of Mexico, mingle with the waters of the Atlantic,—thence the route for all vessels from either river is the same. This fact completely captivated the imagination of Lieutenant Maury, for it placed the two great rivers in close physical and commercial relations. He at once made his views public in a series of letters called the "Inca Papers," the object of which was to call attention to the vast resources which lie dormant in the Valley of the Amazon. He succeeded beyond his most sanguine hopes; his papers were translated and distributed far and wide; and his influence induced the Government of the United States to send exploring expeditions both to the La Plata country and to that of the Amazon, and thus to make known, in an authentic form, the vast wealth that awaits the presence of civilization in those countries. The survey of the La Plata was undertaken by Commander Page, and that of the Amazon and its tributaries by Lieutenants Herndon and Gibbon; and the results amply verified Lieutenant Maury's theories, and moreover so moved Brazil and other South American States, that more liberal

laws as regards emigration, etc. soon followed. Regular steamers are now running on the Amazon, and regular packets connect its mouth with the world at large. Thus the domains of commerce were increased, and one of his great objects in life accomplished.

Irrespective of the scientific and moral interest attached to his labours, the benefits arising to commerce and navigation, in a mere money point of view, have proved to be wonderful, and even now can hardly be estimated. When the researches were commenced, the average passage to the Atlantic Equator was 41 days; by using Maury's charts and directions the voyage is shortened 10 days. Again, from England to California it was then 180 days, it is now 128. From England to Australia it was 127 days, and the return voyage was even of greater length; but by the new route, going by Cape of Good Hope and returning by Cape Horn, the navigator may depend upon good breezes and fair winds, from the time of his crossing the Atlantic Equator to his return to the same place, thus saving at least 50 days in the round voyage between Australia and the mother-country, and this without the smallest outlay on the part of the ship or of her Majesty's Exchequer.

The saving in money to commerce and navigation has been great. A calculation has been made, showing, by the time saved in shortening the voyage between the principal ports of the two hemispheres, what commerce and navigation have, by Captain Maury's labours, gained in money alone. The sum is large, and the lion's share of it has fallen to this country.

It was remarked a few years ago before the British Association by the late Dr. Buist, that in India it was estimated that charts and sailing directions for the eastern seas, such as Captain Maury had at that time prepared only for the Atlantic Ocean, would produce a saving to British commerce of from a quarter to a half million sterling annually. The fulfilment of that prophecy would have been a remarkable result for scientific research in any field, but let us see what has been the actual result, for his researches have since been carried not only into the eastern seas, but into all others.

We have already quoted the saving of time between England and various parts of the world gained by these researches; let us estimate the commercial value of that time, for "time is money." Freights vary according to times and places, but as an average for all voyages by sailing ships it may be assumed to be about a shil-

ling per ton per day; to some ports it is more, to some less; but as a mean for all voyages a shilling per ton per day is not found out of the way. According to this average, freights from Liverpool would be to Rio de Janeiro £2. 10*s.*, to Australia £6. This includes delays in port, loading and unloading, profits, etc.; so that the actual cost of moving a ton of merchandise under canvas at sea may be taken as not less than 6*d.* per day. This would make the saving by a vessel of 1000 tons that takes the new instead of the old route to—

Rio de Janeiro	£250	the voyage.
India or China	250	,,
California	1260	,,
Australia and back	1250	,,

Now, if we could find out the number of sailing vessels of 1000 tons each which are annually required for this trade under canvas between England and other parts of the world, the multiplication of these figures would express startling sums. Suffice it to say, they would be multiplied in each case, except perhaps California, by hundreds. This vast saving has been effected by means so simple, and in ways so gentle and so quiet, that those who have reaped the benefits of it scarcely know whence it comes.

The value of the services thus rendered to science and commerce, and therefore to all countries, but more especially to England and the United States, has been recognized by the principal Powers in Europe, in the bestowal of medals and offers of various orders of knighthood. Gold medals were struck in Maury's honour by Holland, the senate of Bremen, Norway, Sardinia, and Sweden. Austria presented her great gold medal of science, Prussia did the same, and, besides, added the "Cosmos" medal at the special request of Humboldt. France presented two gold medals, and moreover offered the insignia of the Legion of Honour. The Pope established distinguishing flags to be worn at their mast-heads, by all the ship-masters from the States of the Church, who would co-operate at sea in this system of research. Those whose journals were approved by Lieutenant Maury received military rank and became entitled to salutes as they passed its ports; and his Holiness forwarded a complete set of all the medals which had been struck during the Pontificate as a mark of appreciation of Lieutenant Maury's scientific labours. Denmark tendered the order of the Dannebrog; Russia, that of St. Anne; Belgium, the order of

Leopold; Portugal, that of the Tower and Sword; but in the Republican judgment of the American Congress, these Orders came under the designation of titles or patents of nobility, and the veto of the Government was put upon them.

The subject of our memoir was now at the summit of his prosperity. He enjoyed the confidence of his fellow-countrymen in a marked degree; the merchants and ship-owners handsomely acknowledged the value of his services to the shipping interest of their port; the establishment, under his orders, was daily increasing in strength and usefulness, and from nothing had sprung into the first rank before the world. The great astronomical work he was engaged upon, namely, forming a complete catalogue of everything visible in the heavens, was progressing satisfactorily; while his name began to be held in reverence and esteem as the American Humboldt, and his darling project, another Antarctic Expedition, seemed on the point of realization, when, like a thunderbolt, in the midst of his useful labours, came the great Civil War in America.

Although absorbed in scientific pursuits, and surrounded by associations from which it was harder to part than life itself, Captain Maury was true to his character, and with the uncompromising honesty which has distinguished him through life, he called his staff together, handed over the Observatory and public property under his charge, sent in his resignation to the United States Government, and upon its acceptance retired to the capital of his State, Richmond. Upon his arrival he immediately tendered his services to the State. It is needless to say that his offer was at once accepted; indeed, although it was Sunday, the convention was assembled by extra call, and an ordinance passed, creating a Council of three citizens to assist the Governor in the emergency. Captain Maury, of the navy of Virginia, was made one of them, and noon of that day found him busily engaged on his new duties. It may be mentioned here, as an interesting historical fact, that the very first act of the three advisers was to recommend that Colonel Robert E. Lee, who also had resigned his commission in the army of the United States, be invited to come to Richmond and take supreme command of the armies of Virginia. Colonel Lee left Arlington at once, and promptly accepted the invitation.

Captain Maury continued to serve on this Council until the treaty of Richmond 1861, was concluded, by which Virginia formally

agreed to make common cause with the Confederate States. Under this treaty the army and navy of Virginia was incorporated with that of the other States, and Captain Maury thus became an officer in the Confederate Navy.

As soon as it became known in Europe that Captain Maury had joined the Southern cause, he received the most kind and friendly invitations both from France and Russia to become the national guest; the first proceeded direct from the Prince Napoleon, the latter from the Grand-Duke Constantine. The object of both was to rescue from the coming "political whirlpool" the philosopher who had already done such good service to the world at large; but he was proof against the double temptation (the uninterrupted pursuit of his own darling studies, and the ample provision for his family offered at the same time), and in all pureness of spirit gave himself up to the Confederate cause. Of all the patriots of the South, not one can lay claim to more self-sacrificing devotion than Captain M. F. Maury. He unhesitatingly gave up pursuits that had become almost part and parcel of his being,—resigned a position at the head of a department which it had taken years of toil to form and develope, and declined even a better appointment offered by foreign countries, to follow what he felt to be the course of duty in his own country. As if these sacrifices were not sufficient, his house and property have been utterly destroyed at Fredericksburg, and, what was worse, all his books and papers carried off. His wife and family were forced to take refuge in the infirmary of a college, where they now are, and a price was set upon his head; but, in spite of these accumulated misfortunes, Captain Maury has never been heard to express anything but a proud satisfaction that in his darkest hours, he has preferred his country's claim to any mere personal consideration.

Captain Maury's family consisted of three sons and five daughters; of the former, one is killed, one desperately wounded, shot through both thighs, and one is now with him; of the latter, two are married.

Since 1862 he has been separated from his family, having been employed on a special mission to England. The loss to science by the present inaction of Captain Maury is immense. Let us hope that it is only a temporary withdrawal from the field of usefulness he loved so well, and in which he conferred such lasting benefits upon mankind.

ROBERT HUNT, F.R.S.,

KEEPER OF MINING RECORDS.

Robert Hunt was born on the 6th of September, 1807, at Plymouth Dock (now Devonport), his young mother being already, for nearly six months, a widow. His father was in the Navy, and perished with all the crew of a sloop of war in the Grecian Archipelago, when carrying dispatches to Admiral Duckworth, who was at that time blockading the Dardanelles. So complete was the wreck that no vestige of the ship was ever found, and so much uncertainty surrounded the matter, that the Admiralty withheld the pensions from the widows for three years, under the expectation that some of the ship's crew would find their way to England. There was, at one time, a belief that this ship had been captured by the Algerine pirates, and the men sold into slavery. Indeed, after the bombardment of Algiers by Lord Exmouth, it was commonly reported that many of these sailors had been found and liberated; and we have heard the subject of the present notice describe his boyish excitement, upon being sent home from school to meet his father. The consequences of this state of uncertainty told sadly upon the widowed mother, and left enduring traces upon the child.

Robert Hunt received his early education in the town of his birth, and, as a child, was remarkable for his powers of memory. The pension granted to the widows of naval officers being exceedingly small, it was only an ordinary country school which could be afforded. When about nine years old, Mrs. Hunt removed her residence to Penzance, and her son Robert was placed at a second-class school in that remote town.

An opportunity occurred which was thought to offer many

advantages, and which would, in all probability, lead to securing a position for Robert Hunt, which could not otherwise be hoped for, and he was sent to London, when not yet thirteen years old. The boy was taken charge of by a surgeon residing at Paddington. He was to make himself useful in the surgery, until he arrived at the age of sixteen, when he was, according to the rules of the College of Surgeons, to have been articled. However, he remained here but eighteen months: he was treated with much severity, and one fine summer morning he ran away. Notwithstanding this, he was befriended by a physician, Dr. Charles Smith, then resident in Hatton Garden, and for five years Robert Hunt divided his time between the doctor's and the house of a brother, who carried on business as a chemist and druggist in Fleet Street. At the expiration of this term, it was found that the cost of attending the lectures and hospitals was more than his mother could afford, and Robert Hunt obtained a situation, and continued for several years in London as an assistant.

An illness, occasioned by his falling through the ice into the river Thames at Datchet, on the night of the funeral of the Duke of York, compelled him to resign his situation and fly to the country. For a period of ten months Robert Hunt remained in the neighbourhood of Dartmoor, and in Cornwall. This time was spent by him in collecting the folk-lore of the people, and we learn that, after this long seclusion, the collection then obtained is now in the press, and will shortly be published.

At this period, too, Mr. Robert Hunt wrote a poem, entitled 'The Mount's Bay,' which was published by subscription at Penzance. This appears to have been the first literary effort that saw light; but we learn that even at school poetic composition was the favourite employment of the boy's leisure.

Robert Hunt returned to the metropolis, and filled for several years a situation of responsibility. He was then induced, by his uncle, to return to Penzance, and commence business in connection with him. This was a most unhappy arrangement, and ended very unsatisfactorily for both parties.

During this time, however, Robert Hunt was active, with a few other young men, in establishing the Penzance Literary and Scientific Institution, and here he gave his first lectures on science. The years which immediately followed this period appear to have been most unhappy ones to the subject of our memoir. His time

was spent, partly in London and partly in Devonport, Mr. Hunt having married a lady of that town. Here he delivered some courses of Lectures on Chemistry, and here he commenced, in 1838, his investigations in Photography. Robert Hunt had, by his lectures, made himself well known in the West of England, and in 1840 he was appointed Secretary of the Royal Cornwall Polytechnic Society. This appointment allowed him much leisure, and this was devoted to inquiries into the "Chemical Action of the Sun's Rays;" "The Influence of Light on Plants;" "The Electricity of Mineral Lodes," and other subjects connected with our metalliferous deposits.

Mr. Hunt during this time produced his 'Manual of Photography,' published by Griffin, which went through five editions; his 'Researches on Light,' published by Longmans, of which two editions have appeared. The investigations carried out by Robert Hunt in the mines of Cornwall recommended him to the notice of Sir Henry de la Beche, and he was offered the situation of Keeper of Mining Records in the Museum of Practical Geology, upon the duties of which office he entered on the 19th of April, 1845. Mr. R. Hunt soon saw the importance of endeavouring to obtain correct returns of the mineral produce of the United Kingdom, and he set on foot an inquiry, which has resulted in the publication of annual 'Mineral Statistics,' giving a more complete return of this valuable British industry than any continental kingdom can show, notwithstanding that the powers of the State are brought to bear, making the returns compulsory; whereas in England those returns are given voluntarily. So valuable to the commercial world are these mineral statistics considered, that a few years since a handsome silver tea-service and a purse of two hundred sovereigns were presented to Mr. Hunt, who also received a handsome testimonial from his Cornish friends on his quitting the office which he held, as secretary to the local society already named.

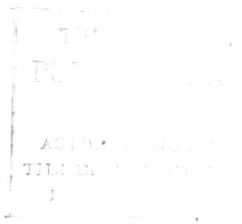
Settled in London, Robert Hunt was enabled to follow the bent of his mind, in which there is somewhat strangely combined a poetical tendency and a mechanical aptitude. About this time 'The Poetry of Science' was published by Mr. Lovell Reeve, and subsequently his 'Panthea, or the Spirit of Nature.' The former work passed through several editions; the latter production was imperfectly understood, and must be regarded as a failure.

The Government School of Mines was organized in 1851, and Robert Hunt was appointed its first Lecturer on Experimental, or, as it was afterwards termed, Mechanical Science. He continued to fill the two offices of Keeper of Mining Records and Professor of Mechanical Science, until a Government Commission, consisting of Sir Charles Trevelyan and Sir Stafford Northcote, recommended an extension of the Mining Record Office, the utility of which had been rendered evident through Mr. Hunt's exertions. Then Robert Hunt resigned his professorship, and he has since that time devoted himself to his duties as Keeper of Mining Records.

Amongst other publications by which Mr. Robert Hunt has made himself known, his 'Synopsis' and 'Handbook of the Great Exhibition of 1851' must be named. He also published works of the same character at the time of the International Exhibition of 1862. In addition to numerous papers communicated to various periodicals, Mr. Robert Hunt wrote his 'Elementary Physics.' He also edited a new edition of 'Metals and Metallurgy' for Messrs. Longman, and undertook the more important work of producing a greatly enlarged edition of 'Ure's Dictionary of Arts, Manufactures, and Mines.'

In addition to these labours, being impressed with the importance of giving to the metalliferous miner a certain amount of scientific education, to enable him to pursue his arduous employment with more ease and safety, Robert Hunt has for some years exerted himself in the establishment of the Miners' Association of Cornwall and Devonshire. This institution has established classes for the instruction of miners in chemistry and mechanics in each of the mining centres of the two western counties, and it is progressing satisfactorily, Robert Hunt, as honorary general Secretary, being entrusted with the management of an organization which originated in his efforts.

Robert Hunt commenced active life with but a very imperfect education, but, gifted with a capacity for knowledge, and possessing much industry, he has achieved a position of usefulness which we hope he may long pursue.



FORBES WINSLOW, M.D., D.C.L.

Dr. Forbes Winslow, the 9th son of Captain Thomas Winslow, of His Majesty's 47th Regiment of Foot, and of Mrs. Mary Winslow, whose memoirs are widely known in religious circles, was born at Pentonville, in 1810, and is descended from the Winslows of Massachusetts, who, in the colonial days of America, filled from time to time many important offices in that State. On the termination of the War of Independence, his grandfather, who belonged to the Royalist party, came to England, where his family have since remained. Dr. Winslow received his early education at a private grammar-school at Manchester, and on the first establishment of the University College as a medical school, he commenced his studies there; he afterwards entered at the Middlesex Hospital, and became a pupil of the late Sir Charles Bell, whose brilliant discoveries with reference to the nervous system revolutionized the teaching of our physiologists. In all probability Dr. Winslow's studies were directed towards mental and cerebral diseases by thus early being placed in connection with this great physiologist, whose discoveries laid the foundation for a truthful estimate and a rational treatment of the diseases of the brain and great nervous centres,—at all events, the tendency of his mind was early evinced towards this branch of medicine, and he has continued steadfast in its pursuit. When a student he joined the Westminster Medical Society, and his thonghts ever being directed to the line of practice he had chosen and has since so ably followed, he read a paper "On the Influence of the Mind and Body in the Production of Disease," and another, "On the Influence of the Imagination of the Mother on the Fœtus in Utero." Both papers attracted much attention

and excited keen discussion. Shortly after these papers were read, he contributed another, on "Suicide, Medically considered." This paper formed the foundation for his subsequent work, "The Anatomy of Suicide," which excited much attention at the time of its publication, and was the first English medical treatise on the subject. Whilst still pursuing his medical studies, he contributed largely to the magazines, papers cognate to his own profession, and employed himself in those literary exercises which have since given him such great distinction as a medical writer. The first work which directly associated his name with the practice of lunacy, was his 'Plea of Insanity in Criminal Cases,' a work opening up new views as regards the criminal responsibility of the insane.

Dr. Winslow has throughout his professional career inclined towards the side of mercy in his judgment in all cases where he has seen good reason to suspect mental unsoundness in the culprit, and this tendency, one most undoubtedly in perfect keeping with the humane ideas making such rapid progress in society, has subjected him to some adverse criticism on the part of a certain portion of the press, and his declaration of a belief in the existence of "moral insanity" in minds where the reasoning faculty, to all appearance, is perfectly sound, has drawn upon him much ill-will from those who believe that such a doctrine is calculated to confound vice with disease; but Dr. Winslow has at least the advantage of knowing that if he errs, he does so in common with some of the most profound thinkers of the day. The present Archbishop of York, for instance, when Dr. Thomson, in his article on "Crime and its Excuses," in the Oxford Essays, clearly shows by the following extract that he fully indorses the opinions of Dr. Winslow:—"The day has probably arrived already," he says, "when the existence of moral insanity, of a disease which wrecks the moral perceptions and leaves the intellect almost intact, shall be recognized as fully as any other kind of madness." The testimony of such a man is, we think, pretty conclusive that such opinions may be held by those who feel no inclination to make dangerous innovations in our criminal code, and who are not likely to remove recklessly the safeguards of society.

During Dr. Winslow's active professional career, he has been placed very prominently before the public eye, in consequence of the many civil and criminal cases in which he has given evidence,

and in connection with public trials, in which he has been called upon by the law-officers of the Crown as medical referee. Scarcely any trial that has made a great public impression within the last twenty-five years but has been associated with the name of Dr. Winslow. In the trial of Macnaughten for the murder of Mr. Drummond, his name appeared very prominently. In the civil case in which it was sought to prove that Mrs. Cumming was of unsound mind, Dr. Winslow gave an opposite opinion. In the trial of Atkinson for the murder of his sweetheart; in the case of Mrs. Brough, the wetnurse of the Prince of Wales, who murdered her six children; of Weston, who shot Mr. Waugh, the solicitor, of Bedford Row; of Mrs. Vyse, who murdered her children, etc.; and it is at least due to him to say, that in nearly every case his opinion has rescued the accused from the gallows. His services have also been continually demanded by the prison authorities, to investigate doubtful cases of insanity among prisoners.

This class of experience in medical jurisprudence has led to his being largely consulted in all cases of legal dispute, involving subtle questions of mental capacity, and consequently his practice has assumed the character in some respects, of that of a medical jurist,—a position daily becoming of greater importance, in consequence of the vital points arising in so many legal cases, civil and criminal, affecting large monetary interests, the hereditary mental conditions of families, and the fate of individuals accused of crime.

Dr. Winslow, many years since, established an asylum for the insane, at Hammersmith; and here, for a period of upwards of twenty years, he had an opportunity of practically carrying into operation his scientific, enlightened, and humane views of treating insanity on the most approved curative principles. The practical experience of Dr. Winslow, however, has not been confined wholly to cases of mental alienation; he is consulted very widely in all cases of disease involving the brain and nervous system, where no mental alienation is apparent. The experience his long residence among his patients gave him, has enabled him to take a very prominent place among the leading psychologists of the day, and has earned for him a high position as a consulting physician and medical jurist. His sagacity in discovering and treating incipient symptoms of brain disorder, involving epilepsy, convulsive diseases of all kinds, paralysis, epilepsy, etc., and especially of that terrible malady softening of the brain, have earned for him a foremost

place among the leading physicians of the day, and have won him the confidence of the profession and the public. There is a vast debatable ground between absolute and declared madness, and the myriad forms of nervous disorders to which he has long devoted his attention, and the fruits of which he has given to the public in his elaborate work 'On Obscure Diseases of the Brain and Disorders of the Mind,' which has already gone through three editions.

In the year 1847, Dr. Winslow established the quarterly 'Journal of Psychological Medicine.' This very important contribution to the history of thought, morbid and otherwise, was edited by Dr. Winslow for seventeen years with very great ability. From its very commencement it took liberal and enlightened views of psychological medicine, and the ability of its articles not only attracted the attention of thinking men, professional and otherwise, but enforced contributions from their pens, and it may fairly claim to have established a new branch of scientific thought, which "the world will not willingly let die." This journal was successfully carried on up to the end of last year, when the professional engagements of Dr. Winslow became so pressing as to force him to bring it to a conclusion. The new vein of thought it opened up, however, must continue to influence our literature, advance the science of psychological medicine, and throw much light upon the varying phases of mental alienation.

At the installation of the Earl of Derby as Chancellor of the University of Oxford, Dr. Winslow had the honorary degree of D.C.L. conferred upon him. He is a Fellow of the College of Physicians, Edinburgh, Doctor of Medicine of the University of Aberdeen, and member of the Royal College of Physicians, London, and has been President of the Medical Society of London. In 1851 he was appointed by the Council of that Society "Lettsomian Professor" for that year, in the course of which he delivered three lectures, having reference to his own particular branch of medicine. They were, 1, on the Psychological Vocation of the Physician; 2, on the Medical Treatment of the Insane; 3, on the Medico-Legal Evidence in Cases of Insanity. These lectures were published in 1854 as a separate volume, under the title of 'Lettsomian Lectures on Insanity.'

THOMAS THORNYCROFT, Esq.

Thomas Thornycroft was the eldest of the three sons of Mr. John Thornycroft, who, at his son Thomas's birth, in 1816, was the occupier of Tidnock Farm, an estate belonging to the Earl of Harrington, in the parish of Gawsworth, near Macclesfield. When the eldest son was but six years old, the father died, and the three boys were left to the care of their mother. Mrs. Thornycroft was an exemplary parent, and to her devotedness in the early training of her son, much of his success may be attributed. Educated first at Congleton Grammar School, at that time presided over by the Rev. Edward Wilson, he was at a suitable age articled as pupil to a Mr. John Fleet, surgeon, of Macclesfield. The uncongenial nature of this pursuit, however, soon manifested itself, and young Thornycroft's surgical studies were neglected for the more attractive pursuits of modelling and carving. His employer at length became dissatisfied, and finally the youth's indentures were cancelled, and the question of the amount of premium to be returned to his mother was referred for arbitration to an eminent surgeon of Macclesfield. It then came out, and the story has often been repeated, that one of the master's most serious complaints against his pupil was indeed a grievous one. To his horror he one day found all his best scalpels hacked and splintered, and on inquiring the cause, found that young Thornycroft had been devoting these instruments, intended for the carving of living flesh and bone, to a more agreeable though inappropriate use, by endeavouring, with their aid, to convert marble into the semblance of skin and muscle. This was indeed too much for the mildest of doctors, and the lad was dismissed, though there is obviously much in a surgical education which might have assisted the destiny of the young sculptor, had his energies flowed in a more discreet channel.

Fortunately the gentleman to whom the arbitration had been referred, took an interest in the fortunes of the young delinquent, and he was speedily furnished with some good specimens to copy from the antique, whereby his eye became educated and his hand acquired dexterity. The bent of his mind being now apparent, and his devotion to modelling and sculpture increasing with practice, it was thought desirable to ascertain the opinion of some of the most leading men of the day upon his prospects, and through the aid of Mr. Edward Hawkins, the Keeper of Antiquities at the British Museum, and Mr. Davenport, of Capesthorne Hall, Cheshire, specimens of Thomas Thornycroft's work were submitted to Sir Francis Chantrey and to H.R.H. the Duke of Sussex. Chantrey's advice was characterized by the kindness, the straightforwardness, and the candour which so strongly marked his disposition. Acknowledging the freedom of hand which the young man's studies displayed, he added—"But, Sir, this is not the leading feature of a so-called sculptor, though it may be advantageously possessed by him. The skill of the artist consists in the life, expression, sentiment, and design which he imparts to the model in clay; the transferring what he has worked in clay to marble is effected by certain mechanical appliances which render the carver's work comparatively easy. Has your young friend any other profession? If he has, let him follow it, for ours is now not one that a man can fairly rely upon to realize a profitable return for his labour and thought. When I began my career, there were but four sculptors of any note in London, now there are forty at least; and with such competition, had I to start afresh, I could not accomplish the reputation I have attained. But send him up to me, perhaps I may encourage the young man; perhaps discourage him."

Could Sir Francis have lived to witness the state of the arts in England at this day, he would have been startled indeed by the increase in the numbers and the extent of competition which exists amongst sculptors, but he would have discovered that the demand for artistic productions has advanced with equal strides, and that there was little foundation for the apprehension that a genius so forcible and so thoroughly national as his, would not have reaped even a greater harvest of success in this age than in his own.

From the Duke of Sussex's inspection of Mr. Thornycroft's carvings a more important result followed. His Royal Highness having requested Mr. John Francis, then a sculptor of high repute

in London, to attend at the Palace and give his opinion on the works, Mr. Francis expressed great approbation, and the result was, that Thornycroft entered the studio of Mr. Francis as a pupil. Amongst his earlier productions was a bust of Melancholy, suggested by the lines in Milton's 'Il Penseroso,' which was exhibited at the Royal Academy, and purchased by Captain Wellbank, R.N.

In the year 1840, at the close of his pupilage with Mr. Francis, Mr. Thornycroft married the eldest daughter of the sculptor, who is herself an artist of no less celebrity than her husband, and henceforward the names of Mr. and Mrs. Thornycroft are associated together in the annals of British sculpture.

Two years afterwards Mr. Thornycroft experienced the truth of the old saying, generally so appropriate in the case of artists, that "All roads lead to Rome." The winter of 1842 was passed by Mr. and Mrs. Thornycroft in that capital, where they made the acquaintance of Thorwaldsen, Gibson, and other eminent sculptors.

In 1843 Mr. Thornycroft's group of "Medea about to slay her Children" was commenced, a work which was exhibited in the following year in Westminster Hall, by invitation of the Royal Commissioners of the Fine Arts. This composition was very favourably reviewed in the 'Kunstblatt' by Dr. Förster, the eminent German critic, who spoke of it as the only specimen in the exhibition of the "severe" school. It was followed by commissions for two statues in bronze, one of Roger Bigod, Duke of Norfolk, the other of Henry, Earl of Hereford, part of a series of ornamental figures supposed to represent the Barons who signed Magna Charta, and which now stand in niches on either side of the House of Lords.

In the year 1850 Mr. Thornycroft exhibited at the Academy, a group of "Alfred and Ethelburga," a scene representing the Queen in the act of exhibiting to the young Prince Alfred the book which was to be the reward of that one of her children who should first learn to read it. This interesting work has never, as yet, been commissioned.

When the project of the Great Exhibition of 1851 was set on foot, Mr. Thornycroft meditated the preparation of an equestrian statue of the Queen, and his design being favourably entertained by Her Majesty and Prince Albert, every facility was graciously afforded to him for its execution. Not only were elaborate studies of equine proportion permitted to be made in the Royal stables,

but the Queen's celebrated charger 'Haman' was repeatedly taken to the studio, and there with a young female seated on his back, was put through his paces in a circle, in order to give the designer a study of equestrian action. The result was the statue which was exhibited in Hyde Park in 1851. The horse is represented in the action of rearing, with two fore legs off the ground, and being thus rested on the two hind legs only, and requiring some third point of support, this well-known difficulty of sculptors was met by a novel expedient. Her Majesty's riding-dress was represented as reaching nearly to the ground and at its lowest extremity lightly sweeping over a growing plant or flower. By this means a continuity of surface was obtained. This arrangement met with some adverse criticism, but the figure was on the whole admired, and the horse was acknowledged to be an excellent portrait of 'Haman.'

Two or three years afterwards, a statuette in bronze of her Majesty on horseback as she was supposed to be reviewing the troops at Chobham, was executed for the Prince, who had a very sincere appreciation of Mr. Thornycroft's industry and talent. This figure was several times repeated in bronze for the Royal Family. The copyright was afterwards purchased by the Art Union, and the group has by this means become very familiar to the public.

Another interesting work appeared in 1856, being a model for a statue of George Benjamin Thornycroft, a wealthy iron-master of Wolverhampton, and first mayor of that town. This figure is considered to possess many excellences of composition.

Another important work is an altar tomb in Ledbury Church, near Malvern, to the memory of John Hamilton, infant son of John Martin, Esq., M.P., of the Upper Hall, Ledbury. The child is represented as in sleep, under a coverlet, with the hands crossed on its bosom. In this group, the artist is said to have reproduced, without imitation, much of the effect inspired by Chantrey's celebrated Sleeping Children at Lichfield, and Banks's monument to Miss Boothby at Ashbourne.

Somewhere about this period also was produced a figure called "The Knitting Girl," which has attracted the favourable notice of Dr. Waagen. It is marked by simplicity, ease, and gracefulness.

In the year 1857, there appeared in the Academy a bronze statuette of "Washington;" in 1858 a model for a marble statue

of "Lady Anna Chandos Pole," which has been much admired; and in 1860, a sketch for a statue of "Havelock."

Mr. Thornycroft also competed for the Wellington memorial. Into this work an unusual extent of detail was introduced, and the whole history of the Duke's career was, as far perhaps as is possible, narrated in the symbolical language of sculptural art.

For many years of his life Mr. Thornycroft has been engaged at intervals in an historical work of a more imaginative cast, representing Boadicea, accompanied by two of her daughters, launching the thunders of war at a supposed enemy, from a chariot drawn by two horses at full speed. This large heroic work is as yet incomplete; but in its progress it is known to have received the commendations and the encouragement of the late Prince Consort. A cast of the colossal head of the Boadicea was exhibited in this year's Academy.

Mr. Thornycroft is also engaged upon mnemonic statuary for the Palace of Westminster. Two figures, executed in white marble, one of Charles I., the other of James II., each in accurately studied costume, are now on the point of leaving his studio.

The latest of his completed works is a bronze equestrian statue of the late Prince Consort, which was inaugurated at Halifax on the 17th of September last,—the cost, amounting to 1300 guineas, having been met by public subscription. The statue and pedestal measure eighteen feet from the ground. The horse was modelled from an animal named 'Nimrod,' selected from the stud of her Majesty, who, as in the former instance, was graciously pleased to place it at Mr. Thornycroft's disposal. Two other equestrian statues of the Prince, intended for the towns of Liverpool and Wolverhampton, are also in the course of preparation.

Our memoir would be incomplete without a brief allusion to the works of Mrs. Thornycroft. Before her marriage, whilst practising in her father's studio, this lady had acquired great facility in modelling, and had even attracted public attention by a figure which she exhibited of life-size, called "The Flower Girl." After her marriage, and whilst on her visit to Rome with Mr. Thornycroft, the notice of the sculptor Gibson was attracted by two models executed by her whilst in that city, one of "Sappho," the other of a "Sleeping Child." Mr. Gibson was so favourably impressed with these works, that when he was consulted by the Queen as to the person best qualified to carry out her wishes in having models and

statues of the Royal children executed, he at once recommended Mrs. Thornycroft.

Accordingly, on her return to England, Mrs. Thornycroft received a commission from her Majesty, the result of which was the completion of a work representing four of the Royal children in the characters of the four seasons. Princess Alice was represented as "Spring," in the attitude of offering, as it may be supposed to her Royal mother, a flower from a number of blossoms gathered and held up in the folds of her dress. This was exhibited in 1845. Prince Alfred appeared as "Autumn," clutching a bunch of grapes. This was in the following year. Next followed the Prince of Wales, clothed as a shepherd to personify "Winter," and finally the Princess Royal as "Summer," with a reaper's sickle and the ears of corn of a gleaner. These figures have been extensively multiplied by engravings and statuettes, and are the ornaments of innumerable homes here and in the colonies.

In 1847 the Duchess of Kent, in 1850 her Majesty, and in 1852 the Duchess of Gloucester sat to Mrs. Thornycroft for busts; and from that time up to the present she has received frequent commissions from members of the Royal Family, from ladies of the families of Stanhope, Hardwicke, Sutherland, and many other persons of distinction. Amongst other well-known designs there is a very gracefully arranged figure of the Princess Beatrice represented as a child cradled in a nautilus shell. Very lately the Princess of Wales has honoured Mrs. Thornycroft with sittings, and the bust was exhibited last year.

Amongst the whole of Mrs. Thornycroft's productions hitherto completed and known to the public, none probably has attracted more admiration for its artistic merits than the well-known "Skipping Girl," which first appeared in 1856, and was seen to great advantage at the Paris Exhibition of 1861. Critics of every kind and degree are unanimous in commending the free unaffected grace of this youthful figure, which, whilst it is accurate enough to be a transcript of nature, has just enough of generality about it to raise it from a portrait to the rank of an ideal representation.

JAMES SCOTT BOWERBANK, LL.D.,

F.R.S., F.L.S., F.G.S.

James Scott Bowerbank was born in the parish of Bishopsgate, London, on the 14th of July, 1797, at the residence of his father, a rectifying distiller, and in this business, in conjunction with his brother, he succeeded his father, and continued in it until 1847. At an early age he exhibited a strong attachment to Natural History in general, and especially to the science of Botany. His father rented for many years a portion of the River Lea, in the Edmonton Marshes, for his private recreation; and there he usually spent his school holidays. His greatest pleasure was to wander along the banks of the river, and observe the habits of every living creature beneath its surface, and thus he quickly became familiar with all its inhabitants, and with the plants growing in it or on its margins. In 1818 he became a member of the Mathematical Society of Spitalfields, and remained so until its incorporation with the Royal Astronomical Society in 1845. In the Mathematical Society he became acquainted with many men of similar tastes to his own, and entered earnestly into a course of studies of the natural sciences in general. In 1822, 1823, and 1824, he delivered public courses of lectures on Anatomical, Physiological, and Systematical Botany; and in 1831 a course of lectures on Human Osteology. These studies were steadily continued, although actively employed in a manufacturing business demanding constant and anxious attention for at least twelve hours of the day. His pursuit of the Natural History sciences was a labour of love under difficulties, as at that period the reputation of an attachment to scientific pursuits was rather an opprobrium than a merit in a young commercial man, in the eyes of his friends.

His love of Natural History was not confined to the knowledge of species and their habits, but the anatomy and physiology of all the specimens that came under his observation were the especial objects of his study in the few hours of recreation that were at his disposal. In 1833 he published in the 'Entomological Magazine' a paper "On the Circulation of the Blood in Insects," and subsequently "Observations on the Circulation of the Blood, and on the Distribution of the Tracheæ in the Wings of *Chrysopa perla*," and "On the Structure of the Scales on the Wings of Lepidopterous Insects." He also published in the Phil. Trans. of the Royal Society a paper "On the Organic Tissues in the Structure of the Bony Corals;" and in the Transactions of the Microscopical Society, "A Series of Observations on the Structure of the Shells of Molluscous and Conchiferous Animals." These observations were contemporaneous with those of Dr. Carpenter on similar subjects, and the two papers were read during the same week.

An animated and interesting discussion having taken place at one of the meetings of the Geological Society on the origin and structure of flints and other siliceous deposits, Mr. Bowerbank became deeply interested in the subject, and commenced a series of microscopical researches on the structure of those bodies, which resulted in a conviction that, excepting those deposited in the cavities of volcanic and other terrestrial rocks, the origins of these bodies were nearly, if not all, due to the siliceous fossilization of the Spongiadæ. These ideas were strongly opposed at that time, but they have since then been very generally adopted by the modern schools of geologists.

The results of these researches were embodied in a paper "On the Spongeous Origin of the Flints and Cherts of the Chalk and Greensand Formations," published in the Transactions of the Geological Society; and in one "On Moss Agates and other Siliceous Bodies," published in the 'Annals and Magazine of Natural History.'

His researches into the origin and structures of the fossil Spongiadæ naturally led to frequent examinations of recent species, and to the discovery of many new and singular forms of organization; and thus a new and interesting field of Natural History was opened to his view, and he determined to enter on a series of observations on the structure and organization of this comparatively unknown class of animals. For this purpose he opened an

extensive correspondence with naturalists and other friends in various foreign localities, from whom he received a great number of highly interesting species of sponges, the results of the examination of which are published in three parts in the Philosophical Transactions. Beside the investigation of the anatomy and physiology of the Spongiadæ, he neglected no opportunity of observing the habits and peculiarities of the living animals, and the results of these observations are published in a paper "On the Ciliary Action of the Spongiadæ," in the Transactions of the Microscopical Society, "On the Vitality of the Spongiadæ," Reports of the British Association for 1856 and 1857, and in a paper "On the Organization of *Grantia ciliata*,"—confirming in these papers the valuable observations previously made by Professor Grant and other writers on these subjects, and adding other curious and interesting facts to our knowledge of this obscure branch of Zoology.

On Palæontological subjects he published microscopical observations on the osseous structure of *Pterodactylus giganteus* and other fossil animals, and was the first to establish proofs of the existence of those remarkable flying reptiles during the period of the deposit of the Chalk. He also described a new and very much larger species of those animals, *C. Cuvieri*, from the Kentish chalk; and subsequently, a paper "On the Pterodactyls of the Chalk," in the Proceedings of the Zoological Sociey, in which he proved that the distinctions between the bones of these reptiles and those of birds were readily to be made by the differences existing in the structure and proportions of their bone cells. His geological collection was very extensive.

During his annual excursions for the renovation of health, Mr. Bowerbank was in the habit of proceeding to some well-known geological locality, thus acquiring a knowledge of its stratigraphical peculiarities, and at the same time adding largely to his already extensive collection of fossils from almost every British formation. During these excursions, he became intimately acquainted with the best localities of the Yorkshire coast from the mouth of the Humber to that of the Tees, and collected largely from the Oolitic and Liassic formations. Weymouth and Portland, the Isles of Wight and Sheppey, the crag districts, the coasts of Devonshire and South Wales, Ludlow and Wenlock, and various other localities, were successively visited with similar results,

until the collection became so extensive that it was necessary to erect, near his residence at Highbury, a room forty feet by twenty-eight to receive it; and in this museum he accumulated more than four hundred drawers of choice and highly interesting fossils, nearly the whole of which were mounted on tablets by Mrs. Bowerbank. By this means his specimens became well known to geologists, who selected largely from his stores for the illustration of their works. The type specimens thus figured in the works of Messrs. Bell, Busk, Darwin, Davidson, Dixon, Milne-Edwards, F. Edwards, Fitton, Forbes, King, Lindley, Lyell, Murchison, Owen, Wood, Wright, and others, are very numerous; and many are unique, or exceedingly rare or fine. He also collected the fossil fruits and seeds of the London clay of Sheppey to a great extent, having at one period more than 100,000 specimens in his possession.

As a microscopist, Dr. Bowerbank was one of the earliest of the modern school. He was charmed by the beautiful achromatic combinations for the microscope when first produced by his talented friend the late Mr. William Tulley, and henceforth microscopical anatomy and the investigation of minute organisms occupied a considerable portion of his leisure. The possession of one of those beautiful instruments, the fifth that had been made, attracted a considerable number of scientific men to his house, and at last necessitated the appointment of an especial time for the reception of such visitors, and the evenings of Mondays were accordingly appropriated for that purpose; for a long series of years he has been in the habit of receiving the visits of students of the microscopical branches of Natural History and of Palæontology, and of exhibiting to them his extensive collections in those departments of science for their instruction and amusement.

Having received so much benefit in early life from his association with the Mathematical Society, he was a strong advocate for the establishment of similar ones. He took an active part in the foundation of the Microscopical Society, and was one of the original members of the Entomological Society. In 1844, in conjunction with Dr. Johnston, of Berwick-on-Tweed, he established the Ray Society, and acted as its treasurer for many years. In 1847 he proposed and founded the Palæontographical Society, and filled the office of its honorary secretary until very recently.

WILLIAM ALLEN MILLER, M.D., LL.D., F.R.S.,

PROFESSOR OF CHEMISTRY, KING'S COLLEGE, LONDON.

The subject of this memoir was born at Ipswich, on the 17th of December, 1817. After having left his mother's care, to which he was much indebted for his earliest lessons, the training of William Allen Miller was for some time somewhat desultory. His parents being members of the Society of Friends, he was sent for two years to the Quakers' school at Ashworth, in Yorkshire. Here he appears to have received his first lessons in science;—lectures on chemistry and some other branches of physics having been occasionally delivered in the establishment by one of the masters. Subsequently to this, two years were spent under the care of a private tutor, and at the age of fifteen, William Allen Miller was apprenticed to his uncle, Mr. Bowyer Vaux, one of the surgeons of the General Hospital at Birmingham. He remained with his uncle for five years, having all the advantages which are offered to a young medical man by a large public establishment of this class. Already, having a taste for chemical inquiry, it will be well understood that the opportunities presented by a well-furnished dispensary were not neglected by the thoughtful young man. We know not whether he derived any advantages from the lectures on science, which have always been from time to time delivered in Birmingham. Certain it is that the society into which he was thrown had not yet lost the spirit of inquiry which had been infused into it by Watt, Bolton, Priestley, Wedgwood, and others, and exerted a powerful influence on the young and impressible mind. Up to this time William Allen Miller had no idea of departing from the line of life which his friends had marked out for him, and he steadily and earnestly devoted himself to the

profession of physic. To complete his medical education, he entered King's College, London. At that time Professor Daniell occupied the chair of Chemistry in that establishment, and young Miller was soon drawn within the sphere of that influence, which many remember with pleasure. His natural and cultivated taste for experimental science, soon led him to devote much time and attention to chemistry. The pleasing and satisfactory manner in which Professor Daniell conducted his class served eventually to concentrate his mental powers almost entirely on this science. One of those apparently accidental circumstances, which so frequently settle a man's position in life, now occurred, and determined Mr. Miller's future career. Professor Daniell's assistant fell ill, and this gave Mr. Miller the opportunity of making himself useful to the Professor. The result of his being thus brought into closer contact with Daniell was the establishment of a warm friendship. The laboratory of King's College was free to Mr. Miller, and he had every possible aid from the Professor in the investigations which he was now enabled to pursue. In 1840, Mr. Miller, with a view of extending his knowledge of analytical methods, spent two months with Liebig at Giessen. In 1841 the appointment of Demonstrator of Chemistry in King's College was made, and Mr. Miller was selected for that office on the recommendation of Professor Daniell. This position established, at once and for ever, the profession to which his future life was to be devoted. As demonstrator, Mr. Miller worked with much assiduity and great success for four years, winning, by his attention to the students, his agreeable manners, and the clearness with which he illustrated his science, the favourable opinions of all with whom he came in contact. About this time he took his M.D. degree in the University of London. In 1845, he was elected a Fellow of the Royal Society; and in the same year, on the death of Professor Daniell, Dr. Miller was appointed to succeed that eminent chemist. Previously to the death of his friend and scientific instructor Professor Daniell, Dr. Miller, who had long assisted, was immediately associated with him in a paper "On the Electrolysis of Salts," which was published in the Philosophical Transactions for 1844. In 1845, we find in the 'Philosophical Magazine' a paper, by Dr. Miller, "On the Spectra of Coloured Flames, and Absorption Spectra of Coloured Gases." This paper may be referred to as originating those beautiful investigations, by spectrum analysis,

which have led to the discovery of the metals Rubidium, Cæsium, and Thallium, and as opening the way to that inquiry, which has advanced our knowledge of the physical condition of the sun's surface. Without in any way detracting from the value of the discoveries of Bunsen and Kirchhoff, we cannot but feel that Dr. Miller has a claim, which has been to a great extent passed over, to a considerable share in the development of those new and important truths. Many of those phenomena which have recently been described as new discoveries connected with the bright lines of the spectra of coloured flames, and the absorptive power of certain gases, were more than indicated in Dr. Miller's paper in 1845.

Professor Miller most assiduously devoted all his powers to the duties of his office, and consequently left himself but little time for original investigation. This is to be regretted, for every subject which he has taken up has been fully elucidated by his labours. His accuracy as a chemist has led to his being appointed member of several important commissions. One of these was the inquiry connected with the building stones used in the Houses of Parliament. In 1851 he was one of the Government Commissioners to report on the water-supply of the metropolis, in which inquiry he was associated with Professor Graham and Dr. Hofmann. Professor W. A. Miller confined his attention for a considerable period to the production of his well-known work, 'Elements of Chemistry, Theoretical and Practical,' which was published in the years 1855, 1856, and 1857. Two editions of this important book have been exhausted, and a third edition is, we understand, now passing through the press. Professor Miller was President of the Chemical Society in 1856 and 1857, and he has presided over the Chemical Section of the British Association for the Advancement of Science on two occasions,—at Liverpool in 1854, and at Manchester in 1861. In 1861, when Lord Brougham was installed as Chancellor of the University of Edinburgh, the honorary degree of LL.D. was conferred on the King's College Professor. As one of the Vice-Presidents of the Royal Society, he had so carefully attended to the interests of that important body, that he was, in 1861, on the nomination of General Sabine to the Presidency, appointed Treasurer. For the last thirteen years Dr. Miller has been one of the Assayers to the Mint, and he is at this time a member of a commission appointed by the

War Office, and under the Presidency of General Sabine, to inquire into the practical value of gun-cotton to the army.

It will be evident from what we have stated, that William Allen Miller has been one of those useful men of science, who, without dazzling by their brilliancy, secure the admiration of mankind by their zealous desire to advance our knowledge of the truth. His earnestness in search of truth has been tempered by a religious fear lest he should be led away from it, by the natural tendency of every reflecting mind to escape from the trammels of fact to the freedom of hypothesis. Many chemists have advanced the philosophy of the science more extensively than Dr. Miller has done, but few have secured by their care, and consequent accuracy, a larger share of that confidence which is above all things of value to the investigator.

Amongst the most recent investigations undertaken by Professor Miller, we have evidence of the power to which we have alluded. In the Philosophical Transactions for 1862 is a paper by him, "On the Photographic Transparency of Bodies, and on the Photographic Spectra of the Elementary Bodies," and in the 'Journal of the Pharmaceutical Society' for the same year is a lecture "On Spectrum Analysis," which most satisfactorily deals with the whole question, and should be consulted by all who are desirous of learning the importance of this beautiful method of interpreting Nature, and of understanding the value of its exquisitely delicate indications. The latest labour of the chemist whose life and labours we have endeavoured to sketch, appears in a paper, the joint production of himself and Mr. William Huggins, which was read before the Royal Society towards the close of the last session, and which is now passing through the press. This paper is entitled "On the Spectra of the Fixed Stars," and it proves to us that those orbs which are so remote in space, as almost to defy the power of the astronomer to determine their distance from the earth, are brought by Spectrum Analysis within the grasp of the chemist, who is thus enabled to inform us what metals are undergoing change upon their surfaces, and pouring forth that energy which reaches us in the form of light.