OBITUARY NOTICES.

JAMES SMITH BRAZIER was born at Rye, Sussex, on 7th March, 1825, and losing both his parents in early childhood, he was adopted by his maternal uncle, Mr. Jeremiah Smith, of Springfield Lodge, Rye, whose name appears as one of the early promoters of the Royal College of Chemistry. To the newly-founded institution in Oxford Street, Mr. Brazier repaired in 1847, shortly after completing his school education at King William's College, Isle of Man, taking up his residence with Mr. William Johnson, who was then the Secretary; from him he gained that practical knowledge of electrotyping which often served him as a recreation, and with whom incidentally he succeeded in effecting the electro-deposition of nickel, using for this purpose the comparatively insoluble and easily purified potassium nickel sulphate.

Whilst a student at the Royal College of Chemistry, he published two papers conjointly with Dr. J. E. Mayer, the first entitled "Analyses of the Mineral Constituents of the Flax Plant, and of the Soils upon which the Plants had been Grown," read before this Society, February 5th, 1849; the second, "An Analysis of Plate Glass," was read May 21st, 1849; and in the following year, conjointly with Mr. G. Gossleth, a student from Trieste, "Contributions towards the History of Caproic and Oenanthylic Acids" was read, June 17th, 1850. Mr. Brazier was now appointed Assistant at the College, and in this capacity worked with Dr. A. W. Hofmann through part of his "Researches on the Organic Bases. IX.—Their Molecular Constitution," read before the Royal Society, April 3rd, 1851, in which paper, Dr. Hofmann, acknowledging services rendered, speaks of Mr. Brazier's experimental skill and knowledge in the highest terms of praise.*

Leaving London, he worked for a short time with Professor T. Andrews, of Queen's College, Belfast; and from Ireland he went to Aberdeen, becoming Assistant to Dr. Thomas Clark and Dr. Andrew Fyfe successively, until, by the union of the Colleges and death of the last-named Professor (in 1861), Brazier was chosen by the University Court to succeed to the vacant Chair of Chemistry, with which he afterwards combined the duties of Secretary of the Medical Faculty, and eventually became Dean.

For more than a quarter of a century, Professor Brazier did his work at Aberdeen in a manner which cannot fail to leave a lasting

* See R.C.C. Reports, vol. ii, p. 228.

record, training numerous students and gaining as many friends, until by illness—failure of the heart's action—he was forced to retire last autumn, and died on the 14th January in the present year, aged 64. He left a widow and five children, the three sons being in the service of the Chinese Government.

Professor Brazier was a Fellow of the Institute of Chemistry, and Vice-President of the British Association during the meeting at Aberdeen. He was frequently consulted by the Town Council, acting with Mr. John Pattinson in investigating the causes of failure of the Graving Dock, and tendering a report in 1887. He held no University degree, but arrangements had been made to confer upon him the honorary LL.D. of Aberdeen, when death intervened to prevent its fulfilment.

JOSEPH JAMES COLEMAN was the son of a pharmaceutical chemist in Lincolnshire, and was born there in 1838. His father having died when he was only ten years of age, he had no guide in his early life and studies, but, being of an industrious and studious nature, he made excellent progress in the classes of the Mechanics' Institution of Halifax, where he became connected with a business similar to his father's. He devoted all his spare time to chemistry and physics, with such success that at the early age of twenty-one he read two papers at the Chemical Section of the British Association on certain relations between the atomic weights and volumes of the elements, one of which was duly published in the Proceedings of the Association. His liking for these studies impelled him to devote himself entirely to them, and he soon abandoned his ordinary calling to become a teacher of science, an office which he filled in three different Institutions, one of which was the celebrated training college at Chester, of which the Rev. Dr. Begg was then Principal. At this time the distillation of the Boghead coal for oils and paraffin had been established on a firm footing, in Scotland, by the late Mr. James Young, F.R.S., of Kelly; and a material having been found near Chester which yielded similar products in quantity, Mr. Coleman left Chester to erect and manage works for its treatment. He was not long allowed to remain there, however, as Young's Company coveted his services, and soon secured him for the post of chemical engineer at their Bathgate works, in Scotland, where he was understood to devote himself to the investigation of the waste products with a view to economy. This he did with marked success, and, among other similar things, devised means of liquefying the so-called "incondensable gases," obtaining from them liquid products of high solvent power for many substances. The working out of this investigation led to a much more extended one, the result of which was the production of refrigerating machinery of a

valuable and unique character, with which his name will ever be associated. The "Bell-Coleman" mode of refrigeration has been one of the greatest successes of the present century, and by its means cargoes innumerable of dead meat have been brought home, in perfect condition, from all parts of the world. He contributed numerous papers to various societies and science journals, including the Royal Society of Edinburgh, the Institution of Civil Engineers, the Institution of Engineers and Shipbuilders in Scotland, the Philosophical Magazine, and the Philosophical Society of Glasgow, of which he was a member for about twenty years. For some years previous to his death, the very delicate state of his health debarred him from doing the amount of scientific work which he longed to do; indeed, his complaint, which was chronic bronchitis, compelled him to live a somewhat retired life, and he frequently expressed his regret at being unable to attend the meetings of the Glasgow and Scottish Section of the Society of Chemical Industry, of which he was Chairman. He was unmarried; and latterly he spent his time between his conservatory and his laboratory adjoining, which was fitted and equipped in a manner worthy of him and his work.

Clear-headed, warm-hearted, and with a devotedness to science which might be a rebuke to many of its followers who are more favoured in health, he fought on when many a brave man would have given himself up to the care of his complaint. He died at his residence, Bearsden, near Glasgow, on the 18th of December last, equally beloved and respected by all who knew him.

H. DEBRAY began his scientific career as Assistant to Deville at the École Normale, and aided that investigator in carrying out various researches, amongst which may be mentioned the classical work in which Deville laid the foundation of the aluminium industry. A year later, in 1859, there appeared the first of the long series of memoirs in which the names of Deville and Debray are associated. It was an investigation of the platinum metals, a subject to which the two chemists frequently returned, and the knowledge of which they did so much to extend. It may be said that the present metallurgy of platinum was created by them.

M. Debray will, perhaps, be best remembered by his work on dissociation. Deville had investigated the phenomena of dissociation, and had pointed out on what conditions they depended. But the work still lacked the requisite exact and quantitative confirmation, and it was to the task of supplying this want that M. Debray, who was, in the best sense of the word, a disciple of Deville, and had imbibed to the full his master's ideas, set himself. He selected for study classes of compounds in which the conditions of dissociation

were simple, and the amount of dissociation admitted of accurate measurement. The results, as embodied in his work "On the Dissociation of Calcium Carbonate and of Hydrated Salts," and his "Measurements of the Tensions of Dissociation," are too well known to require description here.

Among his other work may be mentioned his researches on glucinum, molybdenum, and tungsten, with the determination of the vapour-densities of the chlorides of tungsten, and his various syntheses of crystallised minerals.

On Deville's death, in 1881, M. Debray succeeded to his Chair in the École Normale, a post which he filled until his death, which took place at Paris on July 19th, 1888.

He was elected a Member of the French Academy of Sciences in 1877, and a Foreign Member of the Chemical Society in 1883.

W. F. DONKIN was the eldest son of the late Savilian Professor of Astronomy at Oxford. Born in 1845, he went at an early age to Eton, where he was educated, and where he obtained distinction in natural science. On leaving, he read for a Demyship in that subject at Magdalen College, Oxford, and was elected in 1865. Taking his degree with honours in 1868, he prosecuted his favourite study of chemistry, and became Assistant Demonstrator in the University Laboratory, besides undertaking other duties, such as those of Public Analyst to the County. He also became Science Tutor of Keble College. He married in 1876, but lost his wife the following year. This grief led him before long to think of leaving Oxford, and when, in the course of a year or two, the Professorship of Chemistry in St. George's Hospital became vacant, and was offered to him, he accepted the post, and came to live near London. To the study of chemistry he now began to add that of electricity, in which he speedily became proficient—especially in the direction of electric lighting; here, his beautiful dexterity of manipulation stood him in good stead, and he acted for some time as scientific experimenter to a well-known electrical firm, by whom his opinion was much valued. Indeed, in the opinion of one well qualified to judge, he was rapidly making his mark as a leader in experimental investigations requiring high chemical and electrical knowledge.

His marked liking for scientific pursuits was early shown; thus, when about 10 years old, and when on account of his father's health a winter had to be passed in Madeira, he made a collection of the beetles of that island, and, again, a year or two later, he collected, ground, and polished a number of geological specimens of the rocks at Clifton. About this time, also, he began photography, his apparatus consisting of a little wooden box made by the village carpenter which

served as camera, and a common magnifying glass in a pill-box for lens. With this humble outfit he produced some very respectable photographs, and it was not long before his perseverance attracted the attention of a friend who made him a present of a camera and lens, with which he made further and rapid progress. What his ultimate attainments in photography were, especially in Alpine photography, it is scarcely necessary to say. The Exhibition of his Alpine and Caucasian Photographs, which was lately open at the Gainsborough Gallery, was probably unique, for few men, if any, joined, as he did, great powers as a mountaineer to great skill in photography.

Besides making a name for himself as scientist and climber, Mr. Donkin was also an excellent musician, having inherited the talent from his father. Many may still recollect the family quartetts in which he played the viola. His steadiness and experience was such as to make him a useful addition to a performance even when professional artists of the highest rank were playing, and of late years he took on several occasions the viola part in quartetts and quintetts led by Joachim. He also did much towards furthering the cause of music in the people's concerts in the East End, and was always ready, at whatever inconvenience to himself, to help where his aid was asked.

In 1884, Mr. Donkin became Honorary Secretary of the Photographic Society, and in 1885 of the Alpine Club. In 1886, he went to the Caucasus with Mr. C. T. Dent, now the President of the Alpine Club, and last year he made a second expedition there, taking as companion Mr. H. Fox, and Mr. Dent again accompanying him. Mr. Dent was compelled to return through illness, and Mr. Donkin and Mr. Fox with their two Swiss guides continued their mountaineering. On the morning of the 29th or 30th of August, the party started to cross a glacier pass at the eastern base of the great peak marked on the Russian map as Dychtan, with the intention of bivouacking beyond the pass, and attempting the peak next day by its south-eastern face. They were never seen again, and it is probable that some disaster must have overtaken the travellers and their guides in the attempt on Dychtan. Few men have been more widely mourned than Mr. Donkin; his modesty, unselfishness, and fine character endeared him to all with whom he came in contact, and his death has caused a blank in many quarters which it will not be easy to fill.

HENRY W. FIELD, a son of John Field (an officer of the Royal Mint), was born 23rd March, 1803. His early training was in London, and also under a clergyman in Warwickshire.

In 1818, at the early age of 15, he received an appointment by Sir James Morrison as an extra clerk in the Royal Mint. In 1835, he began to study chemistry at Guy's Hospital under Aikin and Barry, and then assisted as an amateur in the Queen's Assay Office under Mr. Robert Bingley, also in the Master's Assay Office under Mr. Beckwith.

In 1850 and 1851, great changes were made in the Mint in all the departments, Mr. H. Bingley resigning, and the Master's Assay Office being abolished; the work of that department was then divided between Professor W. A. Miller and Professor Graham, under the title of "Non-resident Assayers."

The Queen's Assay Office continued to carry on its work, and Mr. Field was appointed by the Master, Sir John Herschel, to succeed Mr. Bingley, with the title of "Chief Assayer," and in this position he continued for 20 years, viz., until his resignation in 1871.

During Mr. Field's connection with the Royal Mint, he had fulfilled a career of increasing usefulness to the country for a period of more than 51 years, and during four reigns, namely, part of George III, that of George IV, William IV, and Victoria.

He died at Brighton in June, 1888, at the age of 85.

Dr. DAVID S. PRICE, superintendent of the Technological Museum at the Crystal Palace, died at Margate, after a protracted illness, on Monday, August 6th, 1888. He was the son of the late Dr. Price, of Margate, and was well known as a practical chemist. His researches on aniline dyes and in other branches of chemical manufacture, have led to important results; he was also the inventor of the very durable pavement now laid down on the roadway of London Bridge, besides having been concerned in many other prominent works. He was a Fellow of the Institute of Chemistry, and was the author of a number of papers on chemical subjects. Dr. Price's long connection with the Crystal Palace made him a well-known figure there; the Technological Museum at that place was due to his energy.

JOSEPH DENHAM SMITH was born in London in the year 1817, and died at his residence, Fair Lawn, Combe Wood, Kingston-on-Thames, December 11th, 1888.

Inheriting from his father great perseverance and shrewdness of character, and endowed with rare intellectual gifts, he was, as a young man, a careful student and a great reader, and afterwards, from his large acquaintance with English literature, a master of the English language.

Early in life, he decided on making chemistry and its allied

sciences his special work, and with the great patience he brought to bear on every subject, he was singularly fitted for work of this kind, which necessarily demands care and thoughtfulness.

In 1833, he entered the laboratory of Mr. Richard Phillips, F.R.S., one of the leading chemists of that day, and one of the first Presidents of our Society. Mr. Phillips was selected by the London College of Physicians in 1836 to revise the *Pharmacopœia Londiniensis*, and it was at that time that Mr. Denham Smith acquired the knowledge of Mr. Phillips's scientific views and methods of investigation which enabled him in 1851 so satisfactorily to edit and superintend in its passage through the press Mr. Phillips's translation of the *Pharmacopœia* of that year, which the author did not live to complete.

At this time also, Mr. Smith began to contribute various papers and reviews to the Medical Journal, Philosophical Magazine, and Chemical Gazette, of which the following, published between 1835 and 1852, may be mentioned :—"On the Composition of Iodide of Iron," "On the Analysis of German Silver and the Separation of Zinc from Nickel," "On the Separation of Barytes and Strontia," "On the Composition of the Carbonate of Zinc," "On the Hydrates of Barytes and Strontia," "On the Detection and Estimation of Colophony when Dissolved in Fixed Oils," "On the alleged Conversion of Carbon into Silicon," "On the Constitution of Sub-sulphates of Copper," "On the Composition of an Acid Oxide of Iron," "On the Composition of South American Guanos, with mode of Estimating Ammonia and process for Separating Lime and Magnesia when in combination with Phosphoric Acid," "On Early Egyptian Chemistry," "Separation of Cobalt and Nickel;" and in later years Mr. Smith published various papers conjointly with his partner, Mr. Teschemacher, and his nephew, Mr. Russell Smith, on the analyses of many of the minerals and drugs met with in commerce.

From the laboratory of Mr. Phillips, the subject of our memoir went to superintend the working out of various special processes at some of the largest chemical works in the country, and for some years had the entire management of the Iron Smelting Works at Workington.

Having by this time acquired a wide knowledge of chemistry, both scientific and manufacturing, he was asked in 1852, and consented, to enter into partnership, at Highbury, with his friend, Mr. E. F. Teschemacher, the elder, who was the earliest professional analyst in London, indeed in the kingdom; and on the death of Mr. Teschemacher in 1862, Mr. Denham Smith became the senior member of the firm of "E. F. Teschemacher and J. Denham Smith," first with Mr. E. F. Teschemacher the younger, and then with his nephew, Mr. H. Russell Smith, until the day of his death.

His scientific attainments, his practical knowledge of manufacturing chemistry and metallurgy, rendered his professional opinion and assistance highly valued and widely sought after by many of the leading merchants and manufacturers in this country.

Mr. Denham Smith was one of the original members of the Chemical Society on its formation in 1841, and there now survive him six others of those constituting the Society in that year.

On December 11th, 1888, he died, after a long and trying illness, borne with patience and calmness.

Mr. JOSEPH STOREY was the youngest son of the late Mr. Isaac Storey, and was born at Bardsea, near Ulverstone, in the year 1833. His father afterwards removed to Lancaster, where he carried on a successful private school until his death at a comparatively early age.

Having received the ordinary school education, Mr. Joseph Storey entered the employment of the large firm of table baize manufacturers carried on by his elder brothers in Lancaster. After some time spent in this occupation, Mr. Storey went abroad, and on his return to England he entered as a student at Owens College, Manchester. There he passed two years, working principally at chemistry under Professor E. Frankland.

After the completion of his chemical studies, Mr. Storey settled in Lancaster, where he became engaged as consulting chemist to the firm of his brothers, and manager of certain branches of their manufacture, in which his chemical and technical knowledge was of great service.

While continuing this employment, his energy found an additional scope in the establishment of a chemical works on his own account; where he manufactured a number of miscellaneous articles, but more especially colours produced from picric acid and other derivatives of phenol. The early age in which he became engrossed in the practical application of chemistry had not enabled him to keep up with the more recondite developments of the science; but he had great experimental skill and aptitude, and was fertile in resources for encountering and overcoming manufacturing and technical difficulties.

For the latter part of his life, Mr. Storey had to contend with increasing ill health, and he died in the spring of 1888, to the grief not only of his own immediate family circle, but to that of the large number of friends to whom he was endeared for his frank and genial character.

WILLIAM WALLACE was born in Edinburgh in the year 1832. He was the son of an artist of celebrity, who survived to see him well

advanced in the study of chemistry, a profession which he had chosen in preference to his father's. His early education was acquired in Glasgow, however, to which city his family had removed when he was but eight years of age. For a considerable portion of his early life, he was a pupil at the High School of Glasgow, where, under the training of Messrs. Connell, Woolski, and other masters of note, he distinguished himself by his receptiveness and industry. At the age of 15, he began to attend the evening popular courses of chemistry given by the late Dr. Frederick Penny at Anderson's College, Glasgow, and was so captivated by what he heard and saw that he resolved to devote himself to the subject, and with that object became a regular student in that laboratory, where for several years he laboured with great assiduity, his material ability and skill in improving apparatus and methods commanding the esteem of all who knew him, while his gentlemindedness won for him many friends. With the object of extending his knowledge of organic chemistry, he then went to Liebig's laboratory at Giessen, where he remained for two years, and took the usual degree; and there can be no doubt that the great master's style influenced all his teaching and practice throughout his after life. On returning to Scotland, he became Laboratory Assistant to Dr. Penny, a post which he held for many years, and when this eminent lecturer's health failed he carried on his lectures. About the year 1856, he began business in Glasgow as an analytical and consulting chemist, and from the first it was manifest that success would attend this effort, a result due to his rare combination of perseverance, firmness, and a keen perception of the practical bearings of all his work. Already he had devoted much time to the technology of "coal-gas" and of sugar refining, subjects on which, as well as in sewage matters and questions relating to water supply, he was justly regarded as a high authority. In the year 1870, he associated himself in business with Mr. R. R. Tatlock and Dr. John Clark, and the partnership, one of the most successful of the kind in the country, was carried on for about 18 years. About the same time he was appointed Gas Examiner to the City of Glasgow, and four years later one of the Public Analysts for that city, offices which, with numerous public appointments, he retained till his death, which took place on the 5th November, 1888, at the too early age of 56. For two or three years previous to his decease, he suffered from declining health, but his keen sense of duty debarred him from taking the rest his complaint required, and he was able to attend to his business with comparatively little interruption until within a month of his decease. He was for more than a quarter of a century a Fellow of the Royal Society of Edinburgh and of the Chemical Society, and his contributions to various branches of applied chemistry and kindred

subjects were both numerous and valuable. The following are the more important of these :—

“On the Chemistry of Sugar Refining, with special reference to Smear.” “On Animal Charcoal, particularly in relation to its use for Sugar Refining.” “On the Chemistry of Sugar Manufacture and Sugar Refining.” “On the Chemistry of Sugar Refining.” “On the Bone Charcoal of Sugar Refiners.” “On the Economical Combustion of Coal-gas.” “On the Bunsen Burner.” “On the Heating Power of Coal-gas of different qualities.” “On the Composition of a peculiar Water.” “On the Conditions in which Sulphur exists in Coal.” “On the Chemistry of Sewage Precipitation.” “On the Decay of Building Stones.” “On the Decline in the Use of Coffee.” “On some peculiar Specimens of Pig Iron.”

Dr. Wallace was a member of the Philosophical Society of Glasgow for 34 years, and filled the office of President for three years, beginning 1882. At a meeting of that Society held 9th January last, a memoir relating to his life and work was read by the Secretary, Mr. John Mayer, F.C.S., and authorised for publication in Vol. XX of that Society's Proceedings, and which through the kindness of the Secretary has been consulted in preparing this note.

JOHN WILLIAMS was born in London on the 9th of March, 1824. His father was for many years Secretary of the Royal Astronomical Society, and a prominent member of other learned bodies.

As a youth, the subject of our notice entered the service of the late Mr. Thomas Morson, of Southampton Row, and while there attended the courses of instruction given in the then newly established School of Pharmacy of the Pharmaceutical Society, Fownes being the Professor of Chemistry. Having passed the necessary examinations, he became a pharmaceutical chemist, and, in due course, a member of the Pharmaceutical Society.

In 1849, he associated himself with Mr. W. King Hopkin to establish the firm of Hopkin and Williams, and Mr. Williams being a sound chemist, the firm soon gained a reputation for fine chemicals and chemically pure preparations.

Mr. Williams took considerable interest in the educational and scientific work of the Pharmaceutical Society, was for many years a member of its Council, and filled the offices both of Treasurer and President. In 1883, he was President of the British Pharmaceutical Conference, and at the time of his death, a Vice-President of the Society of Chemical Industry. He was also for a time a member of Council of the Chemical Society, and one of the original Fellows of the Institute of Chemistry. Mr. Williams read many papers on chemical subjects before the Pharmaceutical Society, Pharmaceutical

Conference, and the Chemical Society, and was always generous in giving practical advice, and, when necessary, pure specimens of chemical substances to scientific chemists engaged in original investigations.

Mr. Williams had been in failing health for several years, and retired from business about a year ago. He died, at his residence in Warwick Gardens, on the 3rd of March, 1889, within a few days of his sixty-fifth year, and was buried in Highgate Cemetery.