

OBITUARY NOTICES.

RICHARD ABEGG.

BORN JANUARY 9TH, 1869; DIED APRIL 3RD, 1910.

RICHARD ABEGG, who joined our Society in 1906, was one of those lovable characters whose pleasure it is to help others, without thought of self. All who knew him personally deplored the terrible accident which cut short his career in the full vigour of his strength, for it deprived them of a true and valued friend; and the loss to science of one who had so successfully devoted his life to its furtherance, both by example and as a teacher, was acknowledged by all those to whom his work was known.

Abegg was the son of Wilhelm Abegg, Legal Advisor to the Admiralty, and Margaret (*née* Friedenthal), both of whom survive him. His grandfather, I. F. Heinrich Abegg, was the well-known Professor of Criminal Law in Breslau; the family was of Swiss origin. He was born on January 9th, 1869 at Danzig, but received his school training in Berlin, where his parents settled when he was a child. Even as a schoolboy, he had a small private laboratory, to the annoyance of his mother, to whom chemical smells were not grateful. His student days, from 1886 to 1890, were spent with Lothar Meyer at Tübingen, with Ladenburg at Kiel, and with Hofmann at Berlin. There he graduated in 1891, his dissertation treating of "Chrysene and its Derivatives." In that year he became a pupil of Ostwald at Leipzig, and in 1892-3 of Arrhenius in Stockholm. During his student days he fulfilled his military duties; in 1891 he was an officer in the Reserve, and in 1900 Oberleutnant in the Reserve in the 9th Regiment of Hussars. It was in that year that he made his first balloon ascent, for military purposes, and he was so charmed with the experience that he and his wife shortly after made another, and from time to time they indulged themselves in that pastime, with what a fatal result we

all know and regret During his voyages in the air he made many scientific observations, which are still unpublished.

In 1894, Abegg became "Privatdozent" and assistant to Nernst, then Professor of Physical Chemistry in Göttingen; while there he was granted the title of professor, on the occasion of the opening of the new buildings. A year later, he was happily married to Line Simon, daughter of Commerzienvat Simon; and in 1899 he was elected "Abteilungsvorstand" of the Chemical Laboratories in Breslau. He received a call to Christiania in 1901, as successor to the celebrated Waage, but declined it; and in the same year he was granted the title of Extraordinary Professor at Breslau. A year before his death he had been appointed full professor in the Technical High School at Breslau, and had erected new chemical laboratories there, which, alas, he was not destined to conduct. While Abegg was teaching at Breslau, many of our countrymen were among his students; Steele, now Professor at Brisbane; Fox, now at Poona; Denison, now in Natal; Hadfield, now with Zeiss at Jena; Cumming, Knox, Gibson, Jackson, Johnson, and many others, when working in his laboratory, learned not only to respect him as a teacher, but to regard him as an intimate friend. For Abegg thought it his duty, as it certainly was his pleasure, to become intimate with his students; they were often in his house, and at Christmas time they joined in the family's festivities. At that time of year used to appear the "Zeitschrift für Metachemie," in which all sorts of absurdities were given forth in an apparently scientific paper, resembling in its get-up the "Zeitschrift für Elektrochemie," of which Abegg was editor from 1901 until his death. His was a rare character; unselfish and considerate of others; sanguine, in his hopefulness; untiring in his work; and full of new and useful ideas, with great conscientiousness, and devoted to his science and to his pupils.

No sketch of Abegg would be complete without allusion to his love of travel and sport. He was well set-up, active, and as untiring in his amusements as in his work; an excellent skater and "ski-er," fond of long tours on foot, and an ardent traveller. In 1896-7 he obtained six months' leave of absence, which he employed in a voyage to India, Ceylon, and Java; his experiences were published in a small volume entitled "Indische Reise."

Although Abegg was granted his degree by Hofmann on an organic thesis, he soon abandoned that branch of our science for the physical side, and was an ardent supporter of the views put forth by Arrhenius, van't Hoff, and Ostwald. He strove to promulgate these views by publishing, along with Herz, his "Chemisches Praktikum" for qualitative analysis (1900), in which the ionic

nature of the fundamental reactions was insisted on. Another useful work from his pen was his "Anleitung zur Berechnung volumetrischen Analysen" (Breslau, 1900); and in 1903 he wrote on "Die Theorie der elektrolytischen Dissoziation," an English translation of which was published by Wiley, of New York, in 1907. With Dr. Sackur, too, he published, in 1907, "Physikalisch-chemischen Rechenaufgaben," a series of examples of calculations in physical chemistry, which met with much acceptance.

But Abegg's name will live in connexion with his great undertaking, the "Handbuch der anorganischen Chemie" (Hirzel, Leipzig, 1905-9). In his preface, Abegg drew attention to the fact that before the inception of this work, "the rich harvest of physico-chemical investigations, partly owing to their appearing in special journals, partly owing to the difficulty of presentment, had often not been accorded that place in chemical literature which their importance merited." He intimated that the scope of this monumental work would be "to present these additions to knowledge in an easily understood form, and to show their close relationship with the other results of investigations in inorganic chemistry," and went on to say that "where possible, special attention would be paid to the theoretical bearing of chemical facts, which up to the present have merely been recorded." His intention was to elevate chemistry from its old position as a descriptive science into a rational one. It is generally acknowledged that in the four parts of this work which have been published, he and his collaborators have done much to fulfil the aspirations of the editor.

One of Abegg's early and important contributions to chemical knowledge was his "Studies on the Freezing Points of Concentrated Solutions," in which he showed that the deviations exhibited by such solutions correspond with the deviations from Boyle's law due to the increase of the number of molecules per unit volume. This research, carried out in 1894, was succeeded by another, in which he studied very dilute solutions of non-electrolytes, and showed that they show the relations stated by Blagden and by van't Hoff, and also that the amount of ionisation of electrolytes, measured by cryoscopy, agrees within narrow limits with that deduced from electric conductivity. Later, in 1897, he worked at dielectric constants, and determined the variation of these magnitudes with temperature. Other subjects of research, partly by himself, partly with pupils, related to the solubility of ammonia in salt solutions, the direct determination of the mobility of ions, the solubility of sparingly soluble salts, and the vapour pressures of ammonium chloride.

From 1899 on, Abegg published on "Valency and the Periodic

System." According to his theory, the elements possess amphoteric properties, *i.e.*, the power to form compounds both with positive as well as with negative ions. The valency of an element is a variable quantity, so that both its positive and negative valency exhibits a maximum; the sum of both these maxima is 8. The smaller number of both maxima corresponds with the stronger valencies, which he named the "chief valency"; the others were termed "contravalencies." This theory, as pointed out by him, is somewhat similar to the abandoned view of Berzelius, and has a certain relationship to the doctrines expounded by Helmholtz in his Faraday Lecture. But the regularity of the behaviour of elements is not general, but is apparently connected with the irregularities of the periodic system. In his "Handbook," these views are developed, and it is certain that he would have contributed other important additions to our knowledge of valency.

Had Abegg lived, there can be no doubt that he would have become one of the leaders of German science, not merely by his ability, his power of influencing others, and his unusual energy, but also by his personal character, which was one that commanded respect and affection from all who knew him, and would have placed him in the front rank of scientific men, without respect to country.

W. R.

MICHAEL CARTEIGHE.

BORN 1841; DIED MAY 30TH, 1910.

MICHAEL CARTEIGHE, whose death occurred at Goring-on-Thames on May 30th, 1910, was born in Lancashire, of Irish extraction, in 1841. He was elected a Fellow of the Society in 1864, and was a Member of Council from 1878 to 1882, and also from 1884 to 1888. Such is the brief record of his official connexion with the Society, but those only who have been his fellow-workers, or who knew him personally, can well appreciate the loss sustained by the death of one who was a man of exceptional intuition and business capacity, of wide knowledge of the world, of enthusiasm for the advancement of physical and chemical science, and one who was ever ready to encourage the student by wise counsel or by material help. Although he contributed no papers to the Proceedings and Transactions, the interests of the Society always received from him the most enthusiastic and liberal support. He gave early indications of an interest in, and a capacity for, chemical and physical research

as a student at University College, where, later, as a demonstrator under Williamson, he took part, with Matthiessen and Holzmann, in some researches in the electrical conductivity of alloys; the results of this work were embodied in a communication to the Royal Society. Just at this critical moment of his career, however, circumstances shunted him to the side-track of pharmacy, and thenceforth his chief, though by no means his only, interests were to be centred in the educational, political, and general progress of the Pharmaceutical Society of Great Britain.

On leaving University College, he entered the School of Pharmacy in Bloomsbury Square, in which he was a distinguished student, carrying off in 1862 its highest award, the Pereira Medal. He was for many years an Examiner of the Pharmaceutical Society and a Member of Council, whilst for fourteen consecutive years (1882-1896) he was President of the Society. In these important positions he always kept before his fellow-workers a high ideal of educational progress, and he was never tired of insisting on the value of a sound scientific training as a foundation on which to build useful and remunerative work in after life. In support of these views, he was largely instrumental in the institution and development of a Research Department of the School of Pharmacy, from which has emanated much valuable work. Michael Carteighe was one of the founders of the Institute of Chemistry, and a member of the first and succeeding Councils for a total period of fifteen years; he was also Vice-President for six years, and Censor for three years. His name appears in the list of petitioners for a Royal Charter, and it is well known that he used his great influence and gave much time and energy in support of the petition, which was granted in 1885. He was Honorary Secretary of the British Pharmaceutical Congress from 1880 to 1882, Honorary Secretary of the International Congress of Pharmacy in 1881, six years Vice-President of the Royal Society of Arts, a member (1893) of the Royal Commission in connexion with the Chicago Industrial Exhibition, Fellow of University College, Member of the Royal Institution, and Honorary Member of many foreign Pharmaceutical Associations.

It is impossible in this slight sketch of his career to give the reader an adequate idea of the unique personality of Michael Carteighe, a man of unfailing *bonhomie*, of untiring energy, of undoubted capacity, and yet withal of tender sympathy, and finally of an inexpressible cheerfulness which could face, with patience and courage, first the partial, and then the total, blindness of the last two years of his active life.

WALTER HILLS.

OSCAR GUTTMANN.

BORN FEBRUARY 25TH, 1855; DIED AUGUST 2ND, 1910.

THE tragic death of Oscar Guttman, as the result of a motor-cab accident in Brussels, came as a terrible shock to those who had seen him full of life and activity a few hours previously, and was a grievous blow to his family and friends, as well as a great loss to the industry of explosives. He had just begun his duties as British Juror at the Brussels Exhibition when the fatal accident occurred which cut him off in his prime and at the height of a successful career.

Guttman was born at Nagy-Becskerek in Hungary. He began his technical career in a Cerasin factory, and at the age of twenty he entered the dynamite works at St. Lambrecht, in Austria, and thus commenced his connexion with the explosive industry which remained the main field of his work. He was successively employed in a guncotton factory near Ofen-Pest, in the Nobel dynamite factory at Iselten, in Switzerland, where the explosive for the St. Gothard tunnel was made, and as manager of the Nobel dynamite works at Avigliana, in Italy.

The literary ability which was a dominant feature of all his activity early showed itself, as he became the editor of *Der Bergmann*, an Austrian mining journal, at the age of twenty-three.

Guttman's connexion with this country began in 1883, when he visited it and had the opportunity of seeing many of the explosive factories. He communicated an account of this journey and his impressions to *Dingler's Polytechnisches Journal*.

In 1888 he started in Vienna as a consulting chemical engineer, and one of his first commissions was the erection of the works for the National Explosives Co. at Hayle, in Cornwall. This induced him, in the same year, to take up his residence in England, and he settled in London as a consulting engineer and chemical adviser, and soon took a leading position in matters relating to explosives in this country. He was a great linguist, and kept up his connexion with the Continent, where he had clients in many countries.

He also devoted attention to the improvement of the manufacture of nitric acid, and took patents for his well-known plant, which has been widely used, also for a process for the concentration of sulphuric acid, and for his "Reaction Tower." The last patent he took out was for the construction of safer buildings in explosive factories, on which he read a paper before the Society of Chemical Industry. The use of this patent he offered free to any who chose to adopt his proposals.

Guttman was a regular contributor to "Dingler" until 1891, and also wrote many papers for the *Zeitschrift für angewandte Chemie*, *Zeitschrift für das gesamte Schiess- und Sprengstoffwesen*, the *Journal of the Society of Chemical Industry*, and the *Proceedings of the Institution of Civil Engineers*. He was the author of "Blasting," 1892, and "The Manufacture of Explosives," 1895, which was his largest work and the best on the subject for many years. He delivered a set of Cantor Lectures at the Royal Society of Arts in 1908, which were afterwards published in book form under the title, "Manufacture of Explosives: Twenty Years' Progress." He also contributed the articles on explosives in *Chemische technische Untersuchungsmethoden* and *Muspratt's Encyclopädisches Handbuch der technischen Chemie*, besides suggesting and taking a most active part in the preparation of "The Rise and Progress of the British Explosives Industry," published by the Explosive Section of the Seventh International Congress of Applied Chemistry.

In addition to his writings on present-day explosives and allied matters, Guttman took a keen and loving interest in the historical and antiquarian side of his subject, and spent much time and money in collecting all the books and information he could. He gave out the result of his researches in the form of an édition de luxe entitled "Monumenta Pulveris Pyrii," which was issued to a limited number of subscribers.

He was a member of the Society of Chemical Industry, serving twice on its Council, and took an active interest in its meetings and work. He was also a vice-president of the Institute of Chemistry, and greatly assisted in the introduction of special technical examinations in connexion with that Institute, and he was a member of the Institution of Civil Engineers.

Guttman had probably one of the most complete collections of books and pamphlets on explosives. He had a remarkably accurate and comprehensive memory, and he had a wonderful faculty for collecting and indexing information about explosive subjects, which was of great advantage to his clients. He was a man of strong opinions and rather enjoyed controversy, but he was always ready and willing to acknowledge when he had been mistaken.

He had an amiable character, which was better appreciated as one became more intimate with him. He did many kind and helpful actions, and was particularly responsive to any kindness shown to himself. He leaves a widow, two sons, and a daughter, and his memory received a tribute any father might be proud to have inspired from a grown-up son, "He was the best man I ever knew."

W. M.

CHARLES HANSON GREVILLE WILLIAMS.

BORN SEPTEMBER 22ND, 1829; DIED JUNE 15TH, 1910.

CHARLES HANSON GREVILLE WILLIAMS, son of S. Hanson Williams, a solicitor, was born at Cheltenham, September 22nd, 1829. His death took place in his little cottage at Smallfields, Horley, on June 15th, 1910.

His early attempts to study practical chemistry did not receive the paternal approbation; indeed, on one occasion, when the boy's pocket-money, saved up for many weeks, had been expended in the purchase of a "chemical chest," the father, with a sweep of his cane, consigned the newly-acquired treasures to destruction.

It was at the house of Dr. J. H. Gladstone, in Tavistock Square, that the writer of this notice first met Greville Williams: this was in the early 'fifties—probably in 1852 or 1853—when the young man was at work as a consulting and analytical chemist in Oxford Court, Cannon Street. He soon migrated to Glasgow, on being appointed first assistant to Professor Thos. Anderson, of Glasgow University, for whom, during three years, he carried out much research work; afterwards he conducted a tutorial class under Dr. Lyon (since Lord) Playfair at Edinburgh. During 1857 and 1858 he was lecturer on chemistry in the Normal College, Swansea. In 1858 he returned to Glasgow as chemist to the works of George Miller and Co., manufacturing chemists. Greville Williams moved to Greenford Green in 1863, remaining with Messrs. Perkin until 1868, when he entered into partnership with M. Edouard Thomas and Mr. John Dower, at the Star Chemical Works, Brentford, the firm being makers of coal-tar colours and subsisting until 1877. Mr. (now Professor) R. Meldola, F.R.S., and, after his retirement in 1872, Dr. Otto N. Witt, were in the service of this firm as chemists. It was under the auspices of Dr. Witt that some of the first azo-compounds were manufactured in this country by the firm of Williams, Thomas, and Dower. On the closing of the works, Greville Williams gave up his connexion with manufacturing chemistry and became photometric supervisor to the Gas Light and Coke Company, with whom he remained until 1901. He then retired into the country, living the life almost of a recluse, and seldom seeing his old friends and acquaintances.

At this time he had become much interested in the language of ancient Egypt, and was acquiring considerable facility in the reading and interpretation of hieroglyphic inscriptions. In this connexion may be quoted a passage from a letter dated December

12th, 1904, where, writing about the Sarcophagus of Seti I. in the Soane Museum, he says: "It is a real misfortune that the sarcophagus is placed where it cannot be photographed, because the old engravings of Egyptian monuments frequently exhibit mistakes in the hieroglyphic texts, but even the scribes and sculptors of the ancient dynasties were by no means impeccable in that respect, as I found when transliterating and translating the stele of Menthusa." Until rheumatism disabled him, he was an expert draughtsman and calligraphist, a fair game-shot, and an enthusiastic angler.

Although in reality a delightful companion endowed with unusual conversational powers and a keen appreciation of literary and artistic culture, Greville Williams possessed a sensitive and modest temperament which tended, especially in his later years, to isolate him from his fellows. He was, perhaps, rather more nervous about his state of health than he need have been, and in consequence, withdrew almost entirely from scientific and social intercourse. It may likewise be considered that his straitened circumstances tended in the same direction, particularly as they debarred him from continuing his researches in pure chemistry. Whenever the conditions of his daily life allowed him leisure and opportunity for original inquiry, he was an enthusiastic worker, possessed of the true chemical instinct and a general scientific aptitude, as well as a large measure of manipulative dexterity and invention. It ought to be added that Greville Williams was a most interesting correspondent, and, having a happy knack of versifying, often passed from prose into poetry in letters addressed to his more intimate friends. Two epistles of this order are at the present moment before the writer. One of these, dated March 1st, 1861, deals in a playful way with the deceitfulness of unsupported spectrum observations, the later epistle, written a quarter of a century afterwards (August 20th, 1885), includes some humorous verses on a literary topic.

Most of Greville Williams's research work was concerned with certain groups of hydrocarbons and of volatile bases produced in the destructive distillation of organic substances, including combustible shales and coals. He made, however, a few incursions into mineral chemistry, especially in reference to peculiarities in the composition of the variety of beryl known as emerald.

Two discoveries of unusual interest were made by Greville Williams. One of these was the isolation of the most remarkable of the pentinenes, namely, isoprene (*Phil. Trans.*, 1860, **150**, 241). Of this hydrocarbon he determined the physical constants with accuracy; it has risen in importance since its polymerisation* into

* See the memoir just cited for an intimation as to such a change.

caoutchouc has been achieved, and since it has been obtained from terpene. In this connexion it is of interest to remember that Greville Williams ascertained that caoutchouc and terpene absorbed the same proportion of bromine. The other chief result of Williams's work was obtained in the study of quinoline bases, when he discovered cyanine or quinoline-blue (*Trans. Roy. Soc. Edin.*, 1856, **31**, 377). This substance, $C_{29}H_{35}N_2I$, was the first of the quinoline dyestuffs to be prepared. Some of these beautifully crystallised compounds have met with considerable application in photography as special sensitisers, but none of them is even tolerably fast to light.

Among the basic constituents present in certain kinds of tars from shales and coals, and in the products derived from the destructive distillation of cinchonine in the presence of potash, Greville Williams recognised and isolated several important bases. Pyridine was one of these; so also was a lutidine, perhaps a mixture of two or more of the nine possible lutidines, as well as a collidine, or a mixture of two or more of the twenty-two possible collidines; all these were found in coal tar, in Dorset shale tar, and in the distillate from cinchonine. Quinoline or leucoline, discovered by Runge, was first thoroughly investigated by Williams (*Journ. Chem. Soc.*, 1863, **16**, 375). Some of the members of this series of bases are of great practical importance in the synthesis of certain medicinal preparations; γ -methylquinoline was first obtained by Williams from cinchonine, and named lepidine (b. p. 257°); it is thought to be identical with his iridoline from coal tar. He also described, under the name of cryptidine (b. p. 274°), one of the dimethylquinolines—perhaps the 2:3- or the 3:4-dimethylquinoline of Behrend.

Much useful work was accomplished by Greville Williams in connexion with the platinum compounds of the volatile bases which he examined. Some of his results were given in memoirs already named or were discussed in notes appearing in the *Philosophical Magazine* for September, 1854, and in the *Chemical Gazette* for August 16th, and September 1st and 15th, 1858. His determinations of vapour density were distinguished for the care and precision with which they were performed: these and other constants of many organic compounds were first accurately determined by him.

To about a score of memoirs and notes on organic bases which are credited to Greville Williams in the Royal Society's Catalogue of Scientific Papers, there must be added about fifteen devoted to hydrocarbons. And during the period 1882–1885, half a dozen inquiries of a technical character, connected with coal-gas and its

manufacture, were carried out and reported upon, mainly in the *Journal of Gas Lighting*.

Greville Williams made, as before stated, a few incursions into the domain of mineral chemistry. Chief among these were his researches on beryls and emeralds which appeared in the *Proceedings of the Royal Society* during 1873 and 1877 (21, 409; 26, 165). The earlier of these papers was devoted mainly to problems connected with the colour of the emerald, but included an account of experiments on the fusion of beryl, quartz, and sapphire by means of the oxy-hydrogen blowpipe. The precautions necessary to secure clear beads of these substances were defined, while the lowering of density by their passage into the vitreous state was accurately recorded. In the second memoir the chief method in use for effecting a separation between glucina (beryllia) and alumina was critically examined and greatly improved.

Two class-books were written by Greville Williams. The more important of these was published in 1857 under the title *A Handbook of Chemical Manipulation*. It contains 407 illustrations, with an appendix of twenty useful tables: a supplement dealing with more recently devised apparatus and methods was brought out in 1879. The other class-book was a *Manual of Chemical Analysis for Schools*, which appeared in 1858. He also wrote numerous articles for Ure's *Dictionary of Arts, Manufactures, and Mines*, for Watts's *Dictionary of Chemistry*, and for King's *Treatise on Coal Gas*. His contributions were clear and exact, while in his accounts of materials and operations his personal experience was largely drawn upon.

In June, 1862, Greville Williams was elected to the Fellowship of the Royal Society; he outlived the rest of the distinguished "fifteen" of that year. It was in 1862 also that he joined the Chemical Society. On November 25th, 1852, he married Henrietta Bosher, who died on February 16th, 1904. One son and three daughters survive.

The writer of this memorial notice has lost a friend of nearly sixty years' standing—a friend of rare quality and of high Christian character.

A. H. C.