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Biographical notices of mineralogists recently deceased.
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[Read March 23, 1933.]

IN the following list of 41 lives, with a range in ages from 45 to 94 years, the average age is 70·7 years. Including previous lists, the average of 424 lives is 65·4 years. As shown in the following table there has been a gradual increase in this average during past years.

Series.	Period.	Min. Mag. vol.	No. of lives.	Total years lived.	Average age.
—	1876-1919	1-18	210	13,271	63·2
I.	1919-21	19	43	2,738	63·6
II.	1921-24	20	49	3,317	67·7
III.	1924-27	21	42	2,858	68·0
IV.	1927-30	22	39	2,660	68·2
V.	1930-33	23	41	2,899	70·7
			424	27,743	av. 65·4

ACHESON (Edward Goodrich) [1856-1931], discoverer and manufacturer of carborundum (SiC), which he first made accidentally in 1891 when experimenting with the electric furnace in the hope of producing diamond artificially. He also produced siloxicon (Si₂C₂O)

¹ Series I-IV in Min. Mag., 1921-30, vols. 19-22. An index to earlier notices in vols. 1-18 is given in vol. 19, pp. 259-262. A mortality curve is given in vol. 20, p. 253.

and artificial graphite on a large scale at the Niagara Falls. He was born at Washington, Pennsylvania, on March 9, 1856, and died on July 6, 1931.

ANDREWS (William Symes) [1847–1929], electrical engineer, was born on September 10, 1847, at Saltford near Bath in Somersetshire, and died on July 1, 1929, at Schenectady in New York State. He went to America in 1875 and in 1879 entered the service of Thomas Alva Edison [1847–1931]. From 1894 he was in the employ of the General Electric Company at Schenectady. There as a result of his work on the improvement of X-ray tubes he lost his hearing and sight. He was also interested in fluorescence and phosphorescence, and in the problem of 'cold lighting'; and in this connexion he prepared various fluorescent artificial minerals [M.A. 2–22]. He was instrumental in introducing at the zinc mines at Franklin Furnace, New Jersey, the use of the iron-spark, rich in ultra-violet rays, for detecting the presence of willemite in the waste tailings from the concentration plant. (C. Palache, *Amer. Min.*, 1932, vol. 17, pp. 78–79.)

AZÉMA (Léon) [1852–1931], a Lieutenant-Colonel in the French Army, joined the French Mineralogical Society in 1909 and was its President in 1921. As a volunteer he had worked for many years in the mineralogical collections in the Natural History Museum in Paris, and under the name of 'Colonel Azéma' he wrote since 1906 a few papers on minerals and rocks. He compiled the useful and detailed geographical index which forms the bulk of vol. 5 of A. Lacroix's 'Minéralogie de la France et de ses colonies'. He died on June 9, 1931. (A. Lacroix, *Bull. Soc. Franç. Min.*, 1932, vol. 54 (for 1931), pp. 198–199.)

BÄCKSTRÖM (Helge Mattias) [1865–1932] was born at Örebro in Sweden on October 6, 1865, and died at Djursholm near Stockholm on July 15, 1932. He studied at Stockholm, Upsala, and Paris, and took the degree of Doctor at Heidelberg in 1891 with a thesis on the liparites of Iceland. Earlier papers in 1887 and 1888 dealt with the electrical and thermal conductivity of crystals and their thermoelectric properties. With W. C. Brøgger in 1888 dahllite was described as a new mineral, and in 1890 they published their classical paper on the chemical composition of minerals of the sodalite group which they regarded as alkali-garnets. After Brøgger's retirement

from Stockholm University (Högskola) in 1890, H. Bäckström became assistant there in 1891, and later (1908) *Professor of Mineralogy and Petrology*, from which post he retired in 1914. He prepared aegirine artificially in 1893, and in 1898 described large and remarkable crystals of phenakite from Kragerø in Norway. Other papers were petrographical; he described orbicular granites from Sweden and Spitzbergen, and a very fine slab of this rock from Kortfors in Örebro was presented by him to the British Museum in 1900. Bäckströmite was named after him by G. Aminoff in 1919. He was given the honorary degree of LL.D. of Montreal in 1913.

Bäckström afterwards took a prominent part in public affairs. He was a Member of the Swedish Parliament (1912–21), serving on various committees; a member of the board of the Swedish State Bank and of the National Debt Office. Since 1924 he was a prominent member of the Municipal Council and Chairman of the Finance Committee in Djursholm. He was also Chairman of the publishing firm of Tiden, member of the board of the Swedish Wine and Spirit Monopoly, Freys Express Company, Auditor of the Waterfalls Board, &c.

BALDAUF (Richard Julius) [1848–1931], mining engineer and private collector of minerals, was born at Chemnitz on March 7, 1848, and died at Dresden on April 28, 1931. After taking the course at the Mining Academy at Freiberg in Saxony, his first work was at the Laurion mines in Greece. He was afterwards manager of coal mines in Saxony and owner of lignite mines in Bohemia. His extensive private collection of minerals, which included many rare species and large show specimens, was open free to the public and was described in detail in a guide-book (1922) [Min. Abstr., vol. 2, p. 485]. Late in life he went on collecting trips to Iceland, Greenland, Brazil, &c. A 'Richard Baldauf Festschrift', published as a special volume of the Society 'Isis' in Dresden on the occasion of his eightieth birthday, contains a biographical notice with portrait and an account of his museum. A rare phosphate mineral from Bavaria has been named baldaufite. (E. Rimann, *Sitzungsber. u. Abhandl. Naturwiss. Gesell. Isis, Dresden*, 1932, for 1931, pp. 9–15, with bibliography.)

BARKEE (Thomas Vipond) [1881–1931], distinguished as a crystallographer, was born at Darwen in Lancashire on March 7, 1881. From Kirkham Grammar School he went to Oxford in 1900, and

while still an undergraduate he obtained leave of absence for a year to study under P. Groth at München. Later, also at the suggestion of Sir Henry A. Miers, he spent more than a year (1908-9) in E. S. Fedorov's laboratory in Petrograd, where he assisted in the preparation of the Crystallo-chemical tables [M.A. 2-100]. In 1909 he was appointed Demonstrator in the Mineral Department at Oxford, and in 1914 University Lecturer (later Reader) in Chemical Crystallography.



T. V. BARKER (in 1927).

He was also Secretary to the Delegates of the University Museum. Unfortunately for the science, he resigned from these appointments in 1928 to take the post of Secretary to the Curators of the University Chest. Dr. Barker's work was marked by a high degree of originality: he always preferred to try methods of his own. His first paper, published in this Magazine in 1903, was on quartz crystals. This was followed by three papers on the regular growth of crystals of one substance on those of another, in which he showed that such regular growths are governed by similarity in molecular volume. Numerous crystallographic de-

terminations made by him on new organic compounds appeared in the papers of other authors. He published, largely at his own expense, three very original books: 'Graphical and tabular methods in crystallography' (1922), 'The study of crystals' (1930), and 'Systematic crystallography' (1930). In the last of these he explained in detail a new method of crystallo-chemical analysis [M.A. 4-337], which is clearly an improvement on the Fedorov method. It is unfortunate that he was not able himself to bring this to a conclusion, but the work is being slowly continued at Oxford and in Holland [M.A. 5-197]. He died on April 15, 1931, following an operation, at the early age of fifty. At a memorial meeting held in the Fedorov Institute in Leningrad resolutions were passed expressing 'our deep regret for the loss of this fine and good man, one of the most outstanding crystallographers of our time'. In the 'Internationaler Geologen und Mineralogen Kalender' for 1933-34, Th. Barker is still included in the long list of the staff of the Fedorov

Institute. (Sir H. A. Miers, Journ. Chem. Soc., 1931, pp. 3344–3348. H. L. Bowman, Nature, London, 1931, vol. 127, p. 788. The Brazen Nose, Oxford, 1931, vol. 5, pp. 121, 148–149, 155–159.)

BARROW (George) [1853–1932], geological surveyor, was a member of this Society since 1893. For thirty-nine years (1876–1915) he was on the staff of the Geological Survey of Great Britain. Amongst much other geological work he made a special study of the metamorphic rocks of the Southern Highlands of Scotland and of Cornwall and Devon. Two of his papers on the metamorphic minerals around the Bodmin Moor granite were published in this Magazine in 1908–9. He died in London on July 23, 1932. (Sir J. S. Flett, Nature, London, 1932, vol. 130, p. 267.)

BECKE (Friedrich Johann Karl) [1855–1931], Professor of Mineralogy in the University of Wien (Vienna), was an Honorary Member of our Society since 1909. He was born on December 31, 1855, at Praha in Bohemia and studied at Wien under G. Tschermak, A. Schrauf, and E. Ludwig, graduating in 1880. In 1882 he was appointed Professor of Mineralogy in the University of Czernowitz (now Cernauti in Romania) and in 1890 in the German University at Praha (Prag). In 1898 he succeeded A. Schrauf, and later G. Tschermak, at Wien, retiring in 1927. His first papers, in 1877, were on the crystallography of glaucodot, cassiterite, and vivianite, and in 1878 he turned to rocks from Greece. Later he issued a series of important monographs on the crystalline schists and metamorphism in the eastern Alps. In connexion with this petrographical work he devised special optical methods for the microscopical determination of rock-forming minerals. The immersion method for the determination of refractive indices was first used by him in 1893, and the bright line seen at the junction of the two media has since 1896 been universally known as the Becke line. This very simple method has done much to advance optical mineralogy. His method for the determination of plagioclase feldspars from the optic axial angles led to a detailed study of skiadromes and isogyres. He also led the way in the study of etch-figures and of ‘molecular axial ratios’ (topic axes). Since 1899 he had acted as editor of ‘Tscherma’s Mineralogische und Petrographische Mitteilungen’, and he was responsible for the last three editions of Tschermak’s well-known ‘Lehrbuch der Mineralogie’. A third volume of Zepharovich’s ‘Mineralogisches Lexicon für das Kaiserthum Österreich’ with a detailed geographical index to the

three volumes was published by him in 1893. F. Becke was an Honorary Member of many academies and scientific societies, and he was awarded the Wollaston Medal by the Geological Society of London in 1929. On the occasion of his seventieth birthday, in 1925, a 'Festband' (Tsch. Min. Petr. Mitt., vol. 38) gave his portrait



F. BECKE (in 1926).

and a bibliography of his 256 published works. He died after a long illness on June 18, 1931. The accompanying portrait is a reproduction of the last photograph that was taken of him. (A. Himmelbauer, Tsch. Min. Petr. Mitt., 1932, vol. 42, pp. i-viii; Verh. Geol. Bundesanst. Wien, 1931, pp. 239-241; Almanach Akad. Wiss. Wien, 1932, pp. 290-295, with portrait. A. Lacroix, Compt. Rend. Acad. Sci. Paris, 1931, vol. 193, pp. 553-555. V. M. Goldschmidt, Nachrichten Gesell. Wiss. Göttingen, Geschäft. Mitt., 1932, for 1931-2, pp. 70-73. E. H. Kraus, Amer. Min., 1932, vol. 17, pp. 226-227, with portrait. C. E. Tilley, Quart. Journ. Geol. Soc.

London, 1932, vol. 88, pp. lxiv-lxv. H. G. Backlund, Geol. För. Förh. Stockholm, 1931, vol. 53, pp. 329-337.)

BECKENKAMP (Jakob) [1855-1931], Professor of Mineralogy and Crystallography in the University of Würzburg, was born at Horchheim near Coblenz on February 20, 1855. In 1872 he helped as a surveyor in re-mapping the Wiesbaden district. Later he entered the University of Bonn, where he studied mathematics, physics, and chemistry (1876-9); afterwards moving to Strassburg to study crystallography under P. Groth, where he graduated in 1881 with a thesis on the thermal dilatation of crystals. After training as a teacher, he taught in schools in Mülhausen, and also worked on the Geological Survey of Elsass-Lothringen. In 1897 he succeeded F. von Sandberger as Professor of Mineralogy and Geology at Würzburg, from which position he retired in 1929. His work in physical crystallography dealt with the thermal, elastic, magnetic, and electrical properties of crystals, and he published a long series of papers on the symmetry of crystals and their atomic structure. Some of his later

papers show a certain amount of tedious repetition and were privately printed. He also published as books, 'Statische und kinetische Kristalltheorien' (1913-15), and 'Leitfaden der Kristallographie' (1919). He died on January 12, 1931. (E. Schiebold, *Centr. Min., Abt. A*, 1931, pp. 257-269, with bibliography of 130 entries.)

BEDER (Robert) [1885-1930] was born on February 16, 1885, at Zürich, where he graduated in 1909 with a petrographical dissertation, afterwards studying at Paris and Heidelberg. In 1911 he migrated to Argentina, and for a short time was assistant in the Museum of Natural History of La Plata, becoming in 1912 a geologist on the Argentine Survey with especial charge of the museum. There he worked for twelve years investigating ore-deposits, especially those of wolfram. In 1914 he succeeded W. Bodenbender as Professor of Mineralogy and Petrology in the University of Córdoba. He died on November 19, 1930. (E. Kittl, *Revista Minera, Argentina*, 1930, vol. 2, p. 382; 1931, vol. 3, pp. 90-95, with portrait and bibliography. *Schweiz. Min. Petr. Mitt.*, 1932, vol. 12, pp. 1-4, with portrait and bibliography.)

BUCCA (Lorenzo) [1857-1930], Professor of Mineralogy in the University of Catania, was born at Palermo on November 23, 1857, and died on April 25, 1930. He had studied at Heidelberg under H. Rosenbusch and was later assistant to G. Strüver in Roma. In 1891 he was appointed Professor of Mineralogy and Geology in the University of Catania, and since 1903 of Mineralogy alone. His few papers are petrographical and on the crystallography of organic compounds. (S. Di Franco, *Boll. Soc. Geol. Italiana*, 1931, vol. 49, pp. lxxvi-lxxx, with portrait and bibliography.)

BÜCKING (Ferdinand Carl Bertram Hugo) [1851-1932], Emeritus Professor of Mineralogy and Petrology in the University of Strassburg (Strasbourg), was born at Bieber in Hesse on September 12, 1851, and died at Heidelberg on November 10, 1932. After studying at Göttingen and Leipzig he graduated at Marburg in 1874 with a mathematical thesis. In 1874-77 he was a geologist on the Prussian Geological Survey, in 1877-79 assistant to P. Groth at Strassburg, in 1881 Professor at Kiel, and in 1883 he succeeded Groth at Strassburg, when the latter was transferred to München. The last post he held until 1917, working at the same time on the

Geological Survey of Elsass (Alsace), of which he was afterwards Director. He also kept up his connexion with the Prussian Geological Survey till a later date when he resided in Heidelberg. H. Bücking's early papers dealt with various minerals, the first, in 1877, being on the optics of astrophyllite, and he determined several minerals occurring in the German salt deposits, including a new species, sulfoborite. He described euclase and herderite from the granite of Epprechstein in Bavaria, and bournonite and xanthoconite from St. Kreuz in Alsace. Many of his papers were petrographical, dealing with the igneous rocks of western Germany. He also wrote on the geology of the Dutch East Indies. His large collection of rock specimens from the Rhön Mts. and the Thuringian Forest was acquired by the British Museum in 1929-30. (R. Brauns, *Centr. Min., Abt. A*, 1933, p. 80.)

Busz (Karl Heinrich Emil Georg) [1863-1930], Emeritus Professor of Mineralogy and Geology in the Westphalian University of



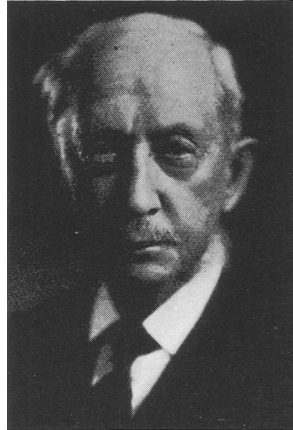
K. Busz (in 1926).

Münster, was born at Cleve in Rheinland on February 2, 1863. He was brought up at Bonn, which he always regarded as his home, and he was buried there; he died on December 8, 1930. He married an English lady, Edith Burbridge, and their only son, Dr. Karl Ernst Busz, is now with the well-known firm of Dr. F. Krantz in Bonn. After graduating in 1887 at Bonn, he was assistant under A. von Lasaulx, G. vom Rath, and H. Laspeyres in the Mineralogical Museum of that University until 1894. He then spent two years as assistant to Max Bauer at Marburg, and in 1896 became Professor of Mineralogy and Geology in the Academy at Münster, afterwards

raised to the status of a University, of which Busz was Rector in 1910. His first work was done under H. von Dechen on the microscopical characters of the lavas of the Eifel (1885), and his doctor's dissertation dealt with the crystallography and optical characters of sphene. Kamarezite, manganosphaerite, phosphosiderite, and tsume-bite were described by him as new mineral species, and a rare mineral

from South-West Africa has been named buszite after him [M.A. 4-149]. He wrote a few papers on the rocks of Devonshire and Scotland, and was the first to record the presence of corundum in the contact-rocks of the Dartmoor granite. (R. Brauns, *Centr. Min., Abt. A*, 1931, pp. 57-61, with bibliography.)

CLARKE (Frank Wigglesworth) [1847-1931], a well-known American chemist, was elected an Honorary Member of our Society in 1913. He was born at Boston, Massachusetts, on March 19, 1847, and died at Washington on May 23, 1931, at the ripe age of 84. After graduating at Harvard University in 1867, he acted as Instructor in Chemistry at Cornell and Harvard Universities. Later he was Professor of Chemistry and Physics in Howard University (Washington, D.C.) and the University of Cincinnati (Ohio), holding the latter post during the period 1874-83. For forty-two years (1883-1925) he was Chief Chemist of the United States Geological Survey; and during the same period he was also Honorary Curator of Minerals in the United States National Museum at Washington. While still engaged in teaching,



F. W. CLARKE (in 1922).

he commenced the well-known series of numerical compilations under the title 'The Constants of Nature', including, I, Specific gravities, boiling- and melting-points (1873); II, Specific heats (1876); III, Expansion by heat (1876); IV, Atomic weights (1880); V, Recalculation of atomic weights (1882). Some of these tables passed through several editions, and they led to his life-long work on American and International Committees on atomic weights, small committees of which he was usually the chairman. During his long connexion with the United States Geological Survey he was responsible for numerous chemical analyses of minerals and rocks, and the data obtained were tabulated in a series of Bulletins of the Survey. In other Bulletins he discussed in detail the chemical constitution of mineral silicates, the arguments being based on a large amount of experimental work made with a view of obtaining substitution products. His best-known work, also published as a Bulletin of the Survey, is his 'Data

of Geochemistry', which passed through five editions (1908-24), and, with Dr. H. S. Washington, 'The Composition of the Earth's crust' (1924). He was also the author of elementary text-books on chemistry, and in later years he published several papers on the inorganic constituents of marine invertebrates. A new uranium mineral was named clarkeite in his honour only a week before his death. Professor Clarke by his genial personality and enthusiasm was well known in England, being an Honorary Member of the Geological and Chemical Societies and Honorary Doctor of Victoria and Aberdeen Universities. (W. T. Schaller, *Amer. Min.*, 1931, vol. 16, pp. 405-407, with portrait. L. M. Dennis, *Science*, New York, 1931, vol. 74, pp. 212-213. L. J. Spencer, *Journ. Chem. Soc. London*, 1931, pp. 3348-3349. *Nature*, London, 1931, vol. 128, pp. 214-215. *Quart. Journ. Geol. Soc. London*, 1932, vol. 88, pp. lxx-lxvi.)

CROOK (Alja Robinson) [1864-1930] was born at Circleville, Ohio, on June 17, 1864, and after graduating at the Ohio Wesleyan University in 1887, he spent three years studying in Europe, taking the doctorate of München in 1892 with a thesis on fossil fishes. In 1893 he was Professor of Mineralogy and Petrology in the Northwestern University at Evanston, Illinois, and in 1906 Curator of the Illinois State Museum at Springfield. He wrote but few papers; these deal mostly with museum work and administration, including a detailed guide to the mineral collection, and a mineralogy of the Chicago area. His last paper in 1930 was with O. C. Farrington on the Tilden meteorites. He died on May 30, 1930. (O. C. Farrington, *Bull. Geol. Soc. Amer.*, 1931, vol. 42, pp. 19-25, with portrait and bibliography. A. J. Walcott, *Amer. Min.*, 1931, vol. 16, pp. 102-103, with portrait.)

CURRIE (James) [1863-1930], shipowner, philanthropist, and a private collector of minerals, was born at Leith on April 13, 1863, and died at Edinburgh on November 3, 1930. He was a life-member of our Society since 1899, and contributed a paper on gyrolite and tobermorite to the Magazine in 1905. He took a mathematical degree at Cambridge in 1885 and was Honorary LL.D. of Edinburgh, Treasurer for many years of the Royal Society of Edinburgh, and President of the Edinburgh Geological Society in 1904-6. He wrote a valuable 'Mineralogy of Færöes', a few papers on Scottish zeolites,

and the section on Scottish pseudomorphs in M. F. Heddle's 'Mineralogy of Scotland'. His mineral collection, rich in zeolites, has been presented by his widow to the Geology Department of the University of Edinburgh. (T. J. Jehu, Proc. Roy. Soc. Edinburgh, 1932, vol. 51 (for 1931-32), pp. 202-204.)

DUPARC (Louis Claude) [1866-1932], of Genève, took part in the jubilee celebration of our Society in 1926 and in that year he was elected an Honorary Member. He was born at Carouge near Genève on February 13, 1866, and died on October 20, 1932. He studied at Genève and Paris, and in 1888 was placed in charge of the Mineralogy course in the University of Genève, becoming soon afterwards Professor of Mineralogy, Petrography, Geology, and Palaeontology, and since 1900 also of Analytical Chemistry. His earliest papers in 1887 dealt with organic chemistry and the crystallography of organic compounds, but later he turned his attention to petrography, in which subject he was an energetic worker and a prolific author. A printed list 'Titres et publications scientifiques de Louis Duparc' (Genève, 1932, with portrait) comprises 355 titles. He did



L. DUPARC (in 1929).

much work on the optical determination of the plagioclase feldspars, and elaborated the Fedorov method with the universal microscope stage. He will be best remembered by his classical work (in collaboration with Miss M. N. Tikonowitch) 'Le platine et les gîtes platinifères de l'Oural et du monde', a large quarto volume published in 1920. He was also joint author of books on analytical chemistry and on optical mineralogy. For twenty years he had visited the Ural Mountains working out the geology and petrography more especially of the platinum-bearing districts. He also made voyages of exploration in connexion with mining enterprises to Romania, Morocco, Abyssinia, Madagascar, and many other countries, from which he always brought back some material of petrographical interest. Just before his death a supposed new mineral was described by one of his pupils under the name duparcite, which is really the

same mineral from Morocco that Duparc had himself in 1927 named genevite. It shows only trivial and unessential differences from idocrase. (A long notice of Prof. Duparc has been written by M. Gysin for *Schweiz. Min. Petr. Mitt.*, 1933, vol. 13, pp. 1-16, with portrait.)

EAKLE (Arthur Starr) [1862-1931], Emeritus Professor of Mineralogy in the University of California at Berkeley, was born at Washington, D.C., on July 27, 1862. His father died while he was a boy and he had to earn his living as a clerk, but after attending night schools he entered Cornell University at the age of 25, where for four years he was Instructor in Mineralogy. During 1894-6 he studied under P. Groth in München, obtaining the degree of doctor for work on the crystallography of iodates and periodates. Returning to the United States he worked in the National Museum in Washington and at Harvard University, and in 1901 he went to the University of California as assistant to A. C. Lawson, becoming professor in 1919. After his retirement in 1930 he went on a visit to Honolulu, and becoming interested in the minerals of Oahu he stayed for a



A. S. EAKLE (in 1927).

year. He died there on July 5, 1931, after an attack of influenza and pneumonia. Dr. Eakle wrote 'Mineral tables for the determination of minerals by their physical properties' (1904) and 'Minerals of California' (1914; 2nd edit., 1923). Of his several mineralogical papers mention may be made of those descriptive of the contact-metamorphic minerals at Crestmore in California, where he reaped a harvest of new species—crestmoreite, foshagite, jurupaite, riversideite, and wilkeite. Other new minerals described by him are erionite, esmeraldaite, palacheite, neocolemanite, probertite, and vonsenite. Some of these have not been confirmed: neocolemanite is the same as colemanite with another setting on the two-circle goniometer (*Min. Mag.* **16**-239). Eakleite, named after him by E. S. Larsen in 1917, was afterwards admitted to be identical with xonotlite. (C. Palache, *Bull. Geol. Soc. Amer.*, 1932, vol. 43, pp. 46-52, with portrait and bibliography. W. T. Schaller, *Amer. Min.*, 1932, vol. 17,

pp. 94–95, with portrait. H. T. Stearns, *Journ. Pan-Pacific Research Inst.*, 1931, vol. 6, no. 4, pp. 2–3.)

ELSDEN (James Vincent) [1856–1930], economic geologist, was a member of this Society since 1919. He was born at Hertford on August 1, 1856, and died at St. Leonards-on-Sea on October 31, 1930. For twenty years (1880–1900) he was partner in an Army coaching establishment. His ‘Principles of chemical geology’, written as a thesis for the London degree of D.Sc., was afterwards published as a book (1910). Other books are ‘Applied geology’, ‘Practical stone quarrying’, and (with J. A. Howe) ‘The stones of London’. He was joint editor of several trade journals, and since 1913 Lecturer on Petrology and Economic Geology at University College, London. (*Quart. Journ. Geol. Soc. London*, 1931, vol. 87, pp. lxx–lxxvi.)

EVANS (John William) [1857–1930], scholar, philosopher, and genius, was a member of this Society since 1891, and successively Treasurer (1918–24), Foreign Secretary, and Vice-President. He was born in the City of London, within the sound of Bow bells, on July 27, 1857, and he prided himself on being a true-born cockney. Many members of his family—his father, brother, sister, and wife—were medical practitioners, but he embarked on the legal profession, becoming a Barrister of Lincoln’s Inn in 1878, Bachelor of Laws of the University of London in 1882, and later a Justice of the Peace. Turning to geology he studied at the Royal College of Science, where he gained the Murchison Medal in 1889 and acted as demonstrator until 1891. He then started a roving life, undertaking two long and difficult journeys of exploration in Bolivia and Brazil. Afterwards he was State Geologist of Kathiawar and later of Mysore, where he was also Chief Inspector of Mines and Explosives. Returning to London, he held appointments as special assistant in the Imperial Institute (1904–13), Lecturer in Geology at Birkbeck College (1906–20), and Lecturer in Petrology at the Imperial College of Science (1912–27). Since 1927 he was Chairman of the Geophysical Company, taking an active part in the prospecting work in the field, and again at the age of 70 he resumed a roving life, camping alone in the Sinai desert. Dr. Evans had many other activities. He was a Colonel of the old Volunteers and was awarded the Volunteer Officer’s Decoration (V.D.). For his work at the Colonial Office in connexion with mineral surveys of the Colonies he was made C.B.E. in 1923. His published works cover a wide range of subjects

dealing with all branches of geology, igneous rocks and petrogenesis, the geometry of twinned crystals, the optical properties of crystals and improved pieces of optical apparatus, the symmetry relations and nomenclature of the thirty-two classes of crystals—and the



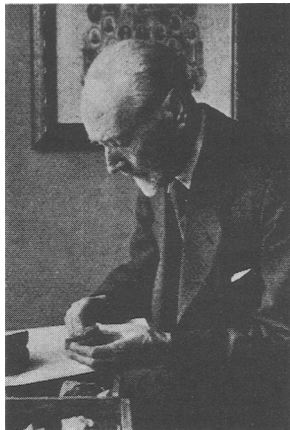
J. W. EVANS (in 1930).

possibility of life on Mars. Some of his papers appeared in this Magazine since 1900. He delighted in intricate and abstruse problems, bringing to bear a wide general knowledge, as well as a knowledge of languages, ancient and modern, and of mathematics. One such scholarly work, a paper of 47 pages on 'The meanings and synonyms of plumbago', was published in the Transactions of the Philological Society in 1908. He died on November 16, 1930. (W. W. Watts, Proc. Roy. Soc. London, Ser. B, 1931, vol. 107, pp. xxvii-xxx, with portrait. L. J. Spencer, Quart. Journ. Geol. Soc. London, 1931, vol. 87, pp. lxii-lxiv. A. Brammall, Geol. Mag. London, 1931, vol. 68, pp. 47-48. Nature, London, 1931, vol. 127, pp. 134-135.)

FLINK (Gustaf) [1849-1931], Swedish mineral collector, dealer, and investigator, was born at Ås in Skaraborg on January 18, 1849, and died at Älvsjö on January 11, 1931. From 1871 until 1904 he was a teacher in an elementary school (Folkskola) in Stockholm, and for a time (1902-5) he owned and worked a small farm at Finja in Skåne. In 1881 he studied chemistry under O. Pettersson, and in 1883 mineralogy under W. C. Brøgger in the University (Högskola) of Stockholm. During one period (1905-16) he was assistant, as successor to G. Lindström, in the Mineralogical Department of the Natural History Museum (Riksmuseet) at Stockholm. He made many expeditions for the purpose of collecting minerals, which he sold to museums and private collectors (to the British Museum since 1892): twice to Iceland in 1883 and 1893; Greenland in 1897; and twelve times to the Urals in 1889-1916. He produced many good mineralogical papers and was a keen collector of new minerals. His discovery of the important mineral locality of Narsarsuk in the Julianehaab district, south Greenland, yielded a rich harvest of

thirty-four species, nine of which he described as new. Later he did intensive work on the minerals of Långban in Sweden, and in his enthusiasm he listed 423 undetermined minerals from this locality, several of which he described as new species, but eventually he became involved and confused. The

following is a list of the thirty-seven new names introduced by him since 1886, many of which represent well-established species: akrochroite, ancylite, chalcoclamprite, cordylite, dixenite, eisenpyrochroite, ektropite, endeiolite, epididymite, harstigitite, heliophyllite, iron-schefferite, katoptrite, langbanite, leucosphenite, lorenzenite, manganomagnetite, molybdophyllite, narsarsukite, neptunite, ochrolite, pinakiolite, platynite, pseudoparisite, pyrobelonite, quenselite, rhodotilite, soda-catapleiite, sphenomanganite, spodiophyllite, synchysite, tainiolite, trigonite, trimerite, weibullite, weslienite, yttrium-apatite. His useful



G. FLINK.

Mineralogy of Sweden (Bidrag till Sveriges mineralogi), of which four parts were published in 1908–17, unfortunately remains incomplete and unindexed. He was awarded the honorary degree of Ph.D. by the University of Upsala in 1900. Flinkite was named after him in 1889. A portion of his collection of Långban minerals was purchased by Harvard University. (G. Aminoff, *Geol. Förh. Stockholm*, 1932, vol. 54, pp. 233–240, with portrait and bibliography; the date of death is there given incorrectly as 1932.)

GREGORY (John Walter) [1864–1932], a most energetic and versatile worker and writer, was a member of this Society since 1892. Born in London on January 27, 1864, he was for a number of years (1879–87) in business with his father as a wool merchant. In the meantime by private study he graduated in the University of London, and in 1887 he entered the Geological Department of the British Museum, where he produced monographs on fossils. In 1900 he was appointed Professor of Geology and Mineralogy in the University of Melbourne and Director of the Geological Survey of Victoria; and afterwards (1904–29) Professor of Geology in the University of

Glasgow. One of the many subjects on which he wrote was that of ore-deposits. He attempted to settle the question 'What is a mineral?' (1909), and he translated from the Russian F. Levinson-Lessing's 'Tables for the determination of rock-forming minerals' (1893). He was a great traveller and explorer and received medals from several Geographical Societies. His last expedition to the Andes of Peru ended disastrously on June 2, 1932. (P. G. H. Boswell, Obituary Notices of Fellows of the Royal Society, London, 1932, no. 1, pp. 53-59, with portrait. Sir J. S. Flett, *Nature*, London, 1932, vol. 129, pp. 930-931.)

HATCH (Frederick Henry) [1864-1932], a member of this Society since 1910, was born in London and educated at University College, London, and the University of Bonn (1883-86), where he graduated Ph.D. For six years (1886-92) he was on the staff of the Geological Survey of Great Britain, working mainly on the petrology of the igneous rocks of Scotland. He then adopted the profession of a mining engineer and geologist, in which he was eminently successful, going first to the Witwatersrand, Transvaal, and afterwards visiting Canada, the United States, Spain, India, Abyssinia, Natal, Urals, and Siberia. Lastly he was technical adviser on metalliferous mining to the Mines Department in London. During 1910-13 he lived in Cambridge, where he lectured on economic geology, and he arranged in the Sedgwick Museum and presented to the University a fine collection of metallic ores. He was the author or joint author of a number of books, notably his 'Introduction to the study of petrology' (1891; 8th edition, 1926), which has had a considerable influence on the study of petrology in England. Other books are his popular 'Mineralogy' (1892), which passed through several editions, 'The gold mines of the Rand' (1895), 'Geology of South Africa' (1905 and 1909), 'Mining tables' (1907), 'An introduction to the study of ore-deposits' (1929), and several reports on mining and mineral resources. He was a past President of the Institution of Mining and Metallurgy and of the Geological Society of South Africa. One of the rare minerals from the Binnenthal, Switzerland, was named hatchite after him. He died in London on September 22, 1932. (R. H. Rastall, *Nature*, London, 1932, vol. 130, p. 602.)

HEADDEN (William Parker) [1850-1932], agricultural and mineralogical chemist, was born near Red Bank, in New Jersey, on Sep-

tember 21, 1850, and died on February 5, 1932. He graduated at Dickinson College in Pennsylvania in 1872, and at the University of Giessen in 1874, and had worked in R. Fresenius's laboratory at Wiesbaden. After acting as an assistant to F. A. Genth in the University of Pennsylvania, he was Professor of Chemistry in the Maryland Agricultural College, the University of Denver, and the State School of Mines of South Dakota. Since 1893 he was Professor of Chemistry and Geology in the Colorado Agricultural College and Chemist to the Agricultural Experimental Station at Fort Collins, Colorado. He wrote several short papers on minerals, especially those of South Dakota and Colorado, and he described griphite, kehoelite, and doughtyite as new species. A large number of experiments were made on the luminescence of calcite (1906; 1923-4 [M.A. 2-495]), and detailed chemical analyses were made of the impurities extracted from large quantities of material, but he found that the differences in colour could not be attributed to the impurities present. He also investigated various crystallized furnace products, and amongst these he was the first to detect stannous sulphide.

HIKI (Tadasu) [1866-1927] was born at Fukui, in central Japan, on May 16, 1866, and died at Kyoto on June 23, 1927. After graduating in geology at the University of Tokyo in 1894, he worked as a research student on Japanese minerals, his well-known work on the topaz crystals of Mino being done during that period. In 1898 he was appointed Assistant Professor of Mineralogy and Geology in the Technological College of the University of Kyoto, and promoted to Professor in 1919, from which he retired in 1926. He wrote many articles on the minerals and ore-deposits, mainly of central Japan.

HINTERLECHNER (Karl) [1874-1932], Austrian geologist, was born at Laibach, in Carniola (now Ljubljana in Slovenia, Yugoslavia), on May 31, 1874, and died there on October 26, 1932. He studied at Wien (Vienna) under G. Tschermak and E. Suess, and for a time (1898-1900) was assistant in the German Technical High School at Brünn (Brno) in Moravia. Afterwards (1900-18) he was on the staff of the Austrian Geological Survey engaged in mapping in Bohemia and Moravia. In 1918 he was appointed Professor of Geology and Mineralogy in the new University at Ljubljana. His papers dealt mainly with the petrography of Bohemian rocks. (W. Hammer, *Verh. Geol. Bundesanst. Wien*, 1932, pp. 147-149.)

JOHANSSON (Karl Fredrik) [1866–1933], after taking the diploma of mining engineer in Stockholm, extended his studies in mineralogy and other subjects in the Universities of Stockholm, Paris, Wien, and Heidelberg. During that period he published in 1892 a paper on enstatite and its alteration products, and another on the crystallography of cerussite and calcite, and contributed a note on the crystallography of ammonium and platinum compounds. He then devoted himself to the profession of mining engineer, visiting many countries. Retiring about 1922, he established a private laboratory at Hedemora, his birthplace, in Sweden. Working there, and partly also in the Natural History Museum at Stockholm, he produced in 1924 two excellent mineralogical papers describing the new species gladite, hammarite, lindströmite, and wittite. In 1928 two further species, gudmundite and haematophanite, were described, and in 1930 a valuable paper giving detailed chemical, optical, and X-ray data for members of the amphibole group [M.A. 4–356]. He died suddenly on February 9, 1933.

KUNZ (George Frederick) [1856–1932], a foremost expert on precious stones, was a member of our Society since 1885. He was born



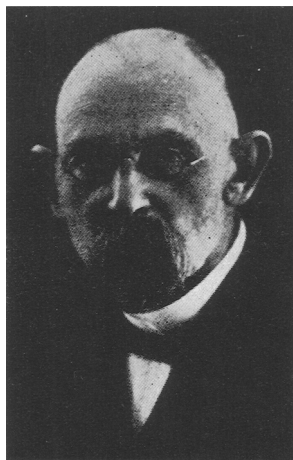
G. F. KUNZ.

in New York on September 29, 1856, and educated at the Cooper Union of Arts and Sciences, where in 1875–76 he was assistant in the chemical laboratory. While still a boy he made and sold extensive collections of minerals. Since 1879 he was a Vice-President of the world-famous jewellers, Tiffany & Co., of New York, and since 1904 Honorary Curator of Gems in the American Museum of Natural History. He was a most energetic, indeed restless and impulsive, man with a striking personality, and was prominent in public movements of various kinds, including several international exhibitions. Since 1883 he was the author of a large number of short papers

on minerals, precious stones, meteorites, and folklore, and he also produced several handsome volumes: 'Gems and precious stones of North America' (1890), 'The book of the pearl' (1908), 'The curious

lore of precious stones' (1913), and 'The magic of jewels and charms' (1915). The sumptuous volumes, 'Investigations and studies in jade' (1906), describing the H. P. Bishop Collection, were edited by him. Since 1882 he had given valuable annual reports on the production of precious stones, the earlier reports appearing in the publications of the United States Geological Survey, and later ones in the 'Mineral Industry'. Annual reports on the platinum metals were also issued over a long period. His great interest in gem-stones is commemorated in the name 'kunzite' for the lilac-coloured gem variety of spodumene. Dr. Kunz was an Officer of the Legion of Honour (France), Knight of the Order of St. Olaf (Norway), and Officer of the Rising Sun (Japan). He died on June 29, 1932. (H. P. Whitlock, *Science*, New York, 1932, vol. 76, p. 75; *Natural History, Journ. Amer. Mus. Nat. Hist.*, 1932, vol. 32, p. 554, with portrait; *Amer. Min.*, 1933, vol. 18, pp. 75-77. R. Brauns, *Deutsche Goldschmiede-Zeitung*, 1932, vol. 35, no. 32, p. 2. P. F. Kerr, *Amer. Min.*, 1933, vol. 18, pp. 91-94, with portrait.)

MÜGGE (Johannes Otto Conrad) [1858-1932], Emeritus Professor of Mineralogy in the University of Göttingen. He graduated as a pupil of C. Klein at Göttingen in 1879 with a thesis on the crystallography of some organic compounds, and he returned there as Professor in 1908, in which post he was succeeded by V. M. Goldschmidt in 1928. In the meantime he acted as assistant to H. Rosenbusch at Heidelberg (1879-82), as curator of the mineral collection in the Natural History Museum at Hamburg (1883-86), Professor of Mineralogy in the Academy at Münster (1886-96 when he was succeeded by K. Busz), and Professor of Mineralogy and Geology in the University of Königsberg (1896-1908). Otto Mügge's work dealt mainly with physical crystallography. For many years he had made a special study of glide-planes and the deformation of crystals. He was one of the first to study the pleochroic haloes in minerals due to radioactivity.



O. MÜGGE (in 1927).

A useful paper was one published in 1903 in which he brought together all the known examples of the regular intergrowth of different mineral species. Some of his papers were petrographical with particular reference to metamorphic rocks. The fifth edition of vol. 1, part 2 of H. Rosenbusch's classical work 'Mikroskopische Physiographie der Mineralien und Gesteine', treating in considerable detail with the rock-forming minerals, was entirely re-written by him, forming a volume of 814 pages. He was born at Hannover on March 4, 1858, and died at Göttingen on June 9, 1932, while still engaged in work, and two of his papers were published after his death. His portrait appeared in a 'Festschrift Otto Mügge' (Neues Jahrb. Min., 1928, Beil.-Bd. 57) forming two thick volumes, which subscribers to the Jahrbuch had to take at a very high price. (H. Rose, Centr. Min., Abt. A, 1932, pp. 401-425, with bibliography of 150 entries. A. Johnsen, Forschungen und Fortschritte, 1932, vol. 8, p. 263.)

OEBEBEKE (Konrad) [1853-1932], Emeritus Professor of Mineralogy and Geology in the Technical High School at München (Munich), was born at Hildesheim in Hannover on November 2, 1853, and died on February 1, 1932. After studying at Heidelberg and Erlangen, he graduated at Würzburg in 1877, and was then an assistant on the Geological Survey of Bavaria and docent in the University of München. In 1887 he became Professor of Mineralogy and Geology in the University of Erlangen, and in 1895 in the Technical High School at München, retiring in 1927. He wrote on Bavarian minerals, more especially those of economic value, and he drew attention to the well-crystallized minerals in cavities in the granite of Epprechtstein in the Fichtelgebirge, a good set of which he presented to the British Museum in 1910. He was responsible for the 12th-16th editions of F. von Kobell's Tables for the determination of minerals, and with E. Weinschenk for the 6th and 7th editions of F. von Kobell's Mineralogy.

PARRY (John) [1863-1931], Chief Chemist of De Beers Company at Kimberley, South Africa, was born at St. Pancras, London, on November 25, 1863, and died at Kimberley on October 6, 1931. He started his career in the chemical laboratory of Epps, the well-known homoeopathic chemists and cocoa manufacturers, and after serving his time with that firm he worked for a number of years in Leicester. On account of his health he went to South Africa in 1899, working in Cape Town and afterwards in Kimberley as a pharmaceutical

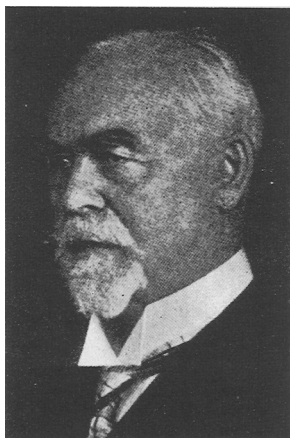
chemist. As a result of his brilliant research work he was invited by De Beers to start the Company's Analytical Department in 1917. There he analysed and described in joint papers published in this Magazine the new minerals awillite and bultfonteinite from the diamond mines. A large number of his analyses of minerals and rocks from the diamond mines are published in A. F. Williams's recent (1932) book 'The genesis of the diamond'. On p. 172, vol. 1, of that work the name parryite appears for a still undescribed mineral.

PENROSE (Richard Alexander Fullerton, *Jr.*) [1863-1931], mining geologist, was born at Philadelphia on December 17, 1863, and died there on July 31, 1931. He took his doctorate at Harvard University in 1886 with a thesis 'Nature and origin of deposits of phosphates of lime', which with some additions was afterwards (1888) published as a Bulletin of the United States Geological Survey. He was for a time attached to that Survey and also to those of Texas and Arkansas. From 1895 to 1911 he was Professor of Economic Geology in the University of Chicago, and he was one of the founders and first editors of the 'Journal of Geology' (Chicago, 1893). He was a member of many scientific societies and a director of several mining companies. He was unmarried and left an estate of over ten million dollars; after handsome bequests to the 'Journal of Geology' and 'Economic Geology', the residue was bequeathed in equal parts to the American Philosophical Society at Philadelphia and the Geological Society of America. A mineral has been named penroseite after him. (J. Stanley-Brown, Bull. Geol. Soc. Amer., 1932, vol. 43, pp. 68-108, with portrait and bibliography. R. T. Chamberlain, Journ. Geol. Chicago, 1931, vol. 39, pp. 756-760, with portrait. A. Schuchert, Amer. Journ. Sci., 1931, ser. 5, vol. 22, pp. 479-480.)

REPOSSI (Emilio) [1876-1931], Professor of Mineralogy in the University of Torino (Turin) since 1923, was born at Milano on June 19, 1876, and graduated at the University of Pavia in 1900. Until 1920 he was assistant to E. Artini in the section of mineralogy in the Civic Museum of Natural History at Milano, and afterwards Professor of Mineralogy in the University of Cagliari. He wrote on Italian rocks and minerals, and he gave the name gavite to a variety of talc from the Gava valley. He died on October 25, 1931. (M. Fenoglio, Boll. Soc. Geol. Italiana, 1931, vol. 50, pp. cxxxi-cxxxvi, with

portrait and bibliography. M. De Angelis, *Atti Soc. Ital. Sci. Nat.* Milano, 1931, vol. 70, pp. 271–278, with portrait and bibliography.)

RINNE (Friedrich Wilhelm Berthold) [1863–1933], an Honorary Member of this Society since 1926, was born at Osterode in the Harz on March 16, 1863, and died of pneumonia at Günterstal near Freiburg in Baden on March 12, 1933, a few days before his seventieth



F. RINNE.

birthday. He graduated at Göttingen in 1883 with a dissertation on the crystallography of some organic compounds, then becoming assistant there to C. Klein. He accompanied Klein to Berlin in 1887, where he also acted as curator in the Mineralogical Museum of the University. In 1894 he was appointed Professor of Mineralogy and Geology in the Technical High School at Hannover, and succeeded O. Mügge at the University of Königsberg in 1903, R. Brauns at Kiel in 1908, and F. Zirkel as Professor of Mineralogy and Petrology at Leipzig in 1909. From the last post he retired in 1928 with the title of Emeritus Professor, and then became Honorary Professor in the

University of Freiburg in Baden, where he continued to work with energy and enthusiasm. In 1899 he visited the Dutch East Indies, and wrote on the geology and petrology of Celebes; in 1900 the Philippine Islands, and in 1904 Kiaochow in China. He was always an enthusiastic worker with many new ideas, covering a wide range of subjects in mineralogy, crystallography, and petrology—and a prolific author. In some of his early papers and in most bibliographies and books of reference his name appears as Fritz Rinne, but later titles give Friedrich Rinne as the author. For many years he made a detailed study of the changes which zeolites and other hydrated minerals undergo when water is lost, introducing a number of new terms of the type *metascolecite*. In connexion with this work and also with his conception of isotypes amongst crystals, he was quick to recognize the importance of the new X-ray methods, and with his pupils at Leipzig intensive work was done. For the study of the fine structure of crystals he suggested the term ‘leptonology’, and

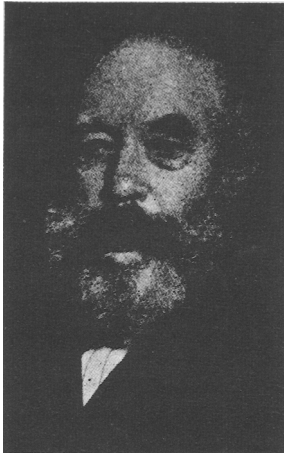
his small book on this subject passed through several editions and was translated into English. Another successful book was his 'Gesteinskunde für Techniker' (1901; 10th edition, 1928). The methods of petrography he applied to the study of the German salt deposits and he showed that some of these have the characters of metamorphic rocks. One salt mineral was named koenenite by him, and another has been named rinneite after him. In later years he was led from the study of liquid crystals and 'living crystals' to a connexion between crystals and life; and some of his latest papers are difficult to follow. In anticipation of the celebration of his seventieth birthday laudatory notices with portraits appeared just too soon in Centr. Min., Abt. A, 1933, pp. 81-82, and Tschermak's Min. Petr. Mitt., 1933, vol. 44, pp. i-ii.

SAUER (Gustav Adolf) [1852-1932] graduated at Halle in 1876 with a dissertation on the phonolitic rocks of the Canary Islands. He was a geologist on the Surveys of Saxony and Baden, and the first Director of that of Württemberg. For many years (1900-23) he was Professor of Mineralogy and Geology in the Technical High School at Stuttgart. The mineral riebeckite was discovered by him in the granite of Socotra in 1888, and in the same year it was determined independently by T. G. Bonney and A. Harker in the Mynydd Mawr rock in Carnarvonshire [Min. Mag. 8-167]. Other mineral names given by A. Sauer are graphitoid, kryptotile, and prismatine. He wrote a popular book 'Mineralkunde' with 26 coloured plates in quarto (1906-7). He died on May 2, 1932. (M. Bräuhäuser, Jahresber. Oberrhein. Geol. Ver. Stuttgart, 1933, vol. 21, pp. ix-xv, with portrait and bibliography. Jahresh. Ver. Naturk. Württemberg, 1933.)

TERMIER (Pierre) [1859-1930], Director of the Geological Survey of France and Inspector-General of Mines, was born at Lyon on July 3, 1859, and died on October 27, 1930. He was educated at the Polytechnic School and the School of Mines in Paris, and after acting as an Engineer of Mines at Nice he was appointed Professor of Geology, Mineralogy, and Physics in the School of Mines at Saint-Étienne. In 1894 he succeeded E. Mallard as Professor of Mineralogy and Petrology in the School of Mines in Paris. He had been attached to the Geological Survey of France since 1886, and in 1911 succeeded A. Michel-Lévy as Director. He was three times President of the French Mineralogical Society and also of the Geological Society of France. His principal work was on the structure of the Alps and

the petrography of their rocks, but he also published many mineralogical papers, discussing, for example, the relations between zoisite (of which he distinguished two optical varieties) and epidote. The clay mineral leverrierite was described by him, and another clay mineral has been named termierite. (E. Raguin, Bull. Soc. Géol. France, 1932, ser. 5, vol. 1 (for 1931), pp. 429-495, with portrait and bibliography. G. Aichino, Boll. R. Uff. Geol. Italia, 1930, vol. 55, no. 12, pp. 1-4, with portrait. Quart. Journ. Geol. Soc. London, 1931, vol. 87, pp. lx-lxii.)

VOGT (Johan Herman Lie) [1858-1932] was born at Tvedestrand in Norway on October 14, 1858, the son of a physician; his mother was a sister of M. S. Lie, the celebrated mathematician. He took the diploma of mining engineer in the University of Christiania in 1880, and afterwards studied at Stockholm, Freiberg, Clausthal, and Aachen. In 1886 he was appointed Professor of Metallurgy in the University of Christiania (now Oslo), and in 1912 Professor of Mineralogy and Geology in the Technical High School at Trondhjem, from which post he retired in 1928 and was succeeded by his son Thorolf Vogt. His first important work, in 1884, was on the crystallized constituents of furnace slags: one of these he named åkermanite, which has since been recognized as a constituent of minerals of the melilite



J. H. L. VOGT.

group. Another crystallized slag product has been named vogtite. A set of the crystallized slags which he had described was acquired by the British Museum in 1891. The study of slags led to a comparison with lavas, on which he published three papers in 1889-90, and later to an intensive study of igneous magmas from a physical chemical standpoint, resulting in a long series of papers: 'Die Silikatschmelzlösungen' (1903-5), 'Physikalisch-chemische Gesetze der Krystallisationsfolge in Eruptivgesteinen' (1905-8), 'Ueber anchi-monomineralische und anchi-eutektische Eruptivgesteine' (1909), 'Die Sulfid-Silikat Schmelzlösungen' (1919), 'The

physical chemistry of the magmatic differentiation of igneous rocks' (1923-31). Vogt was an equally prolific author on the subject of ore-deposits. He produced several reports for the Geological Survey of Norway and also that of Sweden, and long papers on magmas and igneous ore-deposits. He was joint author with F. Beyschlag and P. Krusch of a treatise 'Die Lagerstätten der nutzbaren Mineralien und Gesteine' (1910-13), which was translated into English by S. J. Truscott (1914-16). He died on January 3, 1932. (C. W. Carstens, *Tschermaks Min. Petr. Mitt.*, 1933, vol. 44.)

WEGENER (Alfred Lothar) [1880-1930], German meteorologist and propounder of the much-discussed hypothesis of continental drift, was born in Berlin on November 1, 1880, and perished on his fourth expedition to Greenland in 1930. He graduated at Berlin in 1905 with an astronomical thesis, and in 1924 was appointed Professor of Meteorology and Geophysics in the University of Graz in Styria. He wrote a few papers on meteors, and his calculation of the path of the meteor of April 3, 1916, led to the finding of the Treysa meteorite [M.A. 1-102]. The craters on the moon and also those in Estonia he attributed to the fall of meteorites [M.A. 5-17]. (H. Benndorf, *Gerlands Beitr. Geophysik*, 1931, vol. 31, pp. 337-377, with portrait and bibliography. W. Schmidt, *Almanach Akad. Wiss. Wien*, 1931, pp. 321-328.)

WOODWARD (Charles Josiah) (1838-1932) was one of the few select members of the Crystallogical Society, which was founded in 1876 and amalgamated with the Mineralogical Society in 1883, and since then he was a life-member of our Society. He was born in June 1838, the son of a japanner in Birmingham, and he had a long connexion of over seventy years with the Midland Institute in that city, where he was first attracted by the Penny Lectures in 1856. He became assistant there in 1859, lecturer in 1863, and in 1890 Principal of the Chemistry and Physics Department of the Technical School. He wrote on the minerals of Lilleshall in Shropshire (1883) and of the Birmingham district (1886); small books 'ABC five-figure logarithms' (1893 and 1908) and 'Crystallography for beginners' (1896); and on artificial crystals of gypsum (*Min. Mag.*, 1907). He died on March 12, 1932, at the advanced age of nearly 94. (Portraits and biographical notes in *The Institute Magazine*, Birmingham, 1892, part 82; 1931, part 361.)

WÜLFING (Ernst Anton) [1860–1930], Emeritus Professor of Mineralogy and Petrology in the University of Heidelberg, was born on November 27, 1860, at Elberfeld in Rheinland, and died on December 17, 1930, at Bad Wörishofen in Bavaria, where he had gone on account of his health. He studied chemistry at Genève and under Bunsen at Heidelberg, where he graduated in 1884, and in 1886 he was assistant to A. W. von Hofmann at Berlin. He afterwards



E. A. WÜLFING.

turned to mineralogy and geology, studying at Greifswald and Wien in 1887–88, and then became assistant to H. Rosenbusch at Heidelberg, whom he succeeded in 1908. In the meantime he was professor successively at the University of Tübingen (1891–99), the Agricultural Academy at Hohenheim in Württemberg (1899–1904), the Technical High School at Danzig (1904–7), and the University of Kiel (1907–8). Wülfing made careful chemical and optical determinations on various minerals—pyroxenes, tourmalines, plagioclases, &c., and he introduced several improvements in optical apparatus. He devised a simple hand apparatus for cutting orientated sections

and prisms from crystals, and also various models for demonstration purposes. A notable and laborious piece of work is his ‘Die Meteoriten in Sammlungen und ihre Literatur’ (Tübingen, 1897), which will always remain a useful book of reference. He was responsible for volume 1 of the fourth edition of H. Rosenbusch’s ‘Mikroskopische Physiographie der Mineralien und Gesteine’ (1904–5), and he edited the ‘Festschrift H. Rosenbusch’ (1906). (E. Ernst, *Centr. Min., Abt. A*, 1931, pp. 128–135, with bibliography.)

ZAMBONINI (Ferruccio) [1880–1932], a brilliant and energetic worker, has been lost to Italian science at the early age of 51. He was born at Roma on December 17, 1880, and died at Napoli (Naples) after an attack of influenza on January 12, 1932. After graduating in 1903 he was assistant in chemistry in the Engineering School at Torino (Turin), and afterwards (1906–9) assistant in mineralogy to E. Scacchi at Napoli. He was then Professor of Mineralogy successively in the

Universities of Sassari (1909–10), Palermo (1910–13), and Torino (1913–22). In 1922 he was appointed Professor of General Chemistry in the University of Napoli, where at the time of his death he was Rector (*Rettore Magnifico*). He commenced analysing and describing Italian minerals at the age of seventeen, and a year later he rather rashly ventured on the description of two new minerals which have not been substantiated. One of these, müllerite, having been given a preoccupied name, was renamed zamboninite by Max Bauer in 1901. More recently, in 1930, the name zamboninite has been applied to a fluoride of magnesium and calcium from Etna. His name, grothine (1913), was equally unfortunate, and others of his supposed new mineral species were based on analyses of unsatisfactory material. Altogether he introduced thirty mineral names, several of them as chemical varieties. In the analyses of the complex minerals strüverite (also a preoccupied name) and guarinite he sought the assistance of G. T. Prior, and joint papers were published in this Magazine in 1908 and 1909. His most lasting mineralogical work will be his valuable monograph 'Mineralogia Vesuviana' (1910, with appendix 1912). Later, usually in collaboration with his assistants G. Carobbi, V. Caglioti, R. G. Levi, and others, he did an enormous amount of work in chemical crystallography, especially on the isomorphism of complex compounds of the rare earths; but he still continued to publish valuable papers on mineralogy. A bibliography (by G. R. Levi, *Zeits. Krist.*, 1932, vol. 82, pp. 142–149) of his published papers includes 168 titles. (F. Millosevich, *Rend. R. Accad. Lincei, Cl. Sci. fis. mat. nat.* Roma, 1932, ser. 6, vol. 15, pp. 767–776, with portrait and bibliography. A. Pochettino, *Atti R. Accad. Sci. Torino*, 1932, vol. 67, pp. 207–216. G. B. Alfano, *Zeits. Vulkanologie*, 1932, vol. 14, pp. 179–183, with portrait and bibliography.)



F. ZAMBONINI.

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