

Gill had received under Professor Groth at Munich in 1896 reflected time present in time past. And so, as in due course, crystal structure models dangled from the ceiling and the clank of hydrothermal plumbing resounded in the back rooms of the basement, Dan Burfoot was with it all the way. In retrospect, I should never have expected anything better than grudging aloofness in such a situation, but Dan Burfoot was as pleased to help me as he had always been with the students.

It is not possible to think of Dan without his wife, Marion, whom he married in 1924 while a graduate student at Virginia. For long before I was at Cornell, and years afterward, she was secretary of the Department of Geology, where she reigned with a warm smile and a firm hand. She is now living in Charlottesville, Virginia.

BIBLIOGRAPHY OF JAMES DABNEY BURFOOT, JR.

1930

The origin of the talc and soapstone deposits of Virginia. *Econ. Geol.* 25, 805-826. [Also Ph.D. Thesis, Cornell Univ., 1929.]

1938

Comparative study of origin of talc and soapstone deposits of Virginia [abstr.] *Geol. Soc. Amer. Bull.* 49, 1946.

1941

A. C. Gill's development of the concept of unique diameters in crystallography. *Amer. Mineral.* 26, 617-626.

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MEMORIAL OF CHARLES FINDLAY DAVIDSON

July 16, 1911–November 1, 1967

P. A. SABINE, *Institute of Geological Sciences, London.*

Charles Findlay Davidson, Professor of Geology in the University of St. Andrews, Scotland, since 1955, and formerly Chief Geologist of the Atomic Energy Division of the Geological Survey of Great Britain, died of a heart attack in his home in Cupar, Fife, on November 1, 1967. He was a prolific and lucid author, and he died while his output of work was still in full spate. A vigorous and forceful speaker, he had a zest for discussion and for stimulating lively yet friendly controversy which will be widely missed in Britain and abroad.

Davidson was born at Monifieth, Angus, on July 16, 1911, and was



Charles Findlay Davidson

educated at Morgan Academy, Dundee, and St. Andrews University. He graduated B.Sc. with first-class honors in 1933, and in the following year was appointed to the Geological Survey of Great Britain. While at University he developed an interest in Tertiary igneous rocks that was to lead to several papers in succeeding years, especially dealing with Raasay, Inner Hebrides, and the Faeroes (with F. Walker). For work on the Archaean Rocks of South Harris, Outer Hebrides, he received the D.Sc. degree of St. Andrews in 1942.

On appointment to the Geological Survey and Museum in 1934 he became a member of the Museum staff shortly before the opening of the new building in South Kensington, and was concerned with popular exposition and answering the many and widely varying enquiries from outside organizations and the public. These enquiries increased in importance with the outbreak of the war in 1939, and he was soon involved in preparing reports upon strategic mineral resources and other geological topics more directly related to the war. This work led to the establishment of a military geology unit which provided information including that concerned with every major military operation in Africa and Europe from the first invasion of North Africa. The most significant of these reports were on North Africa and other Mediterranean countries in 1942; on Yugoslavia, Crete, the Dodecanese, the Möhne Valley, Lampedusa, Pantelleria, the geology of certain Alpine Tunnels and various regions of the Far East in 1943; and on flying-bomb sites in 1944. He also contributed various chapters on geology and mineral resources to the handbooks of the Naval Intelligence Division dealing with West Africa, the Belgian Congo, Mozambique, Angola and other territories.

The preparation of a report in 1941 upon uranium resources of the world began an interest in this field he was never to lose. In 1944, as Chief Geologist of the Special Investigations Division (renamed The Atomic Energy Division in 1951), Davidson visited the United States of America for the first time to prepare, with Mr. A. D. Storke, a comprehensive account of world resources of uranium and thorium with recommendations for research programmes throughout accessible territories. He travelled extensively, about 50,000 miles per year, to see personally the various ore occurrences and prospects, and his *Prospector's Handbook to Radioactive Mineral Deposits* was widely read; it appeared in 1949 and was twice reprinted, selling 10,000 copies. With Professor G. W. Bain, he was responsible for recognising the potential of the Witwatersrand as a major source of uranium which became the basis of one of the greatest industries of that country. Together with colleagues, and the British Atomic Energy Establishment at Harwell, he played a part in developing

various types of radiometric prospecting equipment, and in collaboration with the Chemical Research Laboratory was concerned with new techniques of geochemical prospecting. In recognition of these services he was appointed an Officer of the Order of the British Empire in 1953. Part of the investigation that resulted in the spectacular exposure of the Piltdown hoax was the introduction of the use of radioactivity in dating the remains, work which he described in joint papers with S.H.U. Bowie.

On appointment to the Chair at St. Andrews he laid emphasis in his teaching on the economic aspects of geology. He took a full part in the departmental activities including numerous field excursions, and he was planning the enlargement and re-equipping of the Department as part of the University development. A little known interest was his study of the history of geology, and only recently he discovered a preprint of Hutton's *Theory of the Earth*, dated 1796, two years older than the generally accepted first printing.

Davidson excelled in producing broadly synthesized accounts in which was able to draw on his extraordinary, and in many ways unrivalled, knowledge of the world's literature, and he delighted in exciting scientific controversy. These attributes are shown by his papers in recent years, especially those dealing with the epigenetic origin of gold and uranium in the Witwatersrand blanket, the age and origin of the diamantiferous kimberlites of Siberia, which he suggested were of Pre-Cambrian age, fluidized and emplaced during the Mesozoic; and the genetic relationships between ore deposits and evaporites.

Aside from his scientific papers, Davidson found time during the war to provide about 170 mineralogical abstracts. Since 1958, he played a prominent part in advising the Geochemical Society which Russian books should be translated, a task often entailing the examination of several works for every one recommended, and he provided over 200 reviews of Russian books for *Economic Geology*.

He gave much service to the numerous professional and scientific societies and committees of which he was a member, including the following—Raw Materials Panel, Cabinet Advisory Committee on Atomic Energy (1946–7; Secretary); Strategic Minerals Committee, Ministry of Supply (1947–48); Geochemical Society Book Translations Committee (1961); American Geological Institute Translations Committee (1961); Associate Editor, *Economic Geology* (1953); Society of Economic Geologists (Member 1946, Regional Vice-President for Europe 1955–56 and 1957–58); Mineralogical Society of Great Britain and Ireland (Member 1934, Council 1942–44, 1952–54); Geological Society of London (Fellow 1934, Council 1967); Royal Society of Edinburgh (1935, Council 1960–66,

Vice-President 1963–66); Institution of Mining and Metallurgy (Member 1955, Editorial Board of Applied Earth Science 1965); Mineralogical Society of America (Member 1944, Fellow 1949).

As Distinguished Visiting Lecturer to the American Geological Institute he visited the United States in 1963; and he was guest lecturer to the United States National Academy (1965), Bulgarian Academy (1965), and Hungarian Academy (1966). In 1965, he received from the Geological Society of London the Lyell Medal, which as an Angus man, he particularly appreciated; and in December 1967 was posthumously awarded the Neill Prize of the Royal Society of Edinburgh.

When arrangements for the 1967 Symposium of the International Association on the Genesis of Ore Deposits scheduled to be held in Belgrade fell through, he arranged at short notice for the meeting to be held in St. Andrews from the 8th to 17th of September. Despite warnings of cardiac trouble he threw himself into the organization with his customary enthusiasm to bring about a most successful meeting at which about 110 delegates from 28 countries were present. He was elected President of the Association only a fortnight before his death.

This memorial, with its catalog of papers published, committees attended, and work accomplished, must reveal to those who did not know him personally that Charles Davidson was possessed of great organizational gifts and extraordinary drive. What it cannot show are the characteristics that his many friends will remember him by—a great sense of humour, an ability to laugh at himself, and a staunch sense of loyalty. In 1938 he married Helen McLean Wallace, by whom he had four sons; our sympathy is with them in their great loss.

BIBLIOGRAPHY OF C. F. DAVIDSON¹

1932

- The Arctic clay of Errol, Perthshire. *Trans. Perth. Soc. Nat. Sci.*, **9**, 55–68.
The geology of Moncreiffe Hill, Perthshire. *Geol. Mag.*, **69**, 452–464.

1933

- An olivine-bearing conglomerate from the island of Raasay, Inverness-shire. *Geol. Mag.*, **70**, 272–274.

1934

- (WITH A. D. PEACOCK and others) The natural history of South Rona. *Scot. Natur.*, 32 p., *Microyoldia regularis* Verrill, from Errol, Perthshire. *Trans. Perth. Soc. Nat. Sci.*, **9**, 107–108.

¹ Numerous contributions to discussions, book reviews, and abstracts have been omitted from this list.

1935

(WITH F. WALKER) Marginal and contact phenomena of the Dorback granite. *Geol. Mag.*, **72**, 49–63.

The Tertiary geology of Raasay, Inner Hebrides. *Trans. Roy. Soc. Edinburgh*, **58**, 375–407

1936

A boring at St. Fort, Fifeshire. *Trans. Perth. Soc. Nat. Sci.*, **9**, 167–169.

(WITH F. WALKER) A contribution to the geology of the Faeroes. *Trans. Roy. Soc. Edinburgh*, **58**, 869–897.

A series of specimens of 'cramp', from Orkney, petrographically examined. *Proc. Soc. Antiq. Scot.*, **70**, 448–452.

1937

The geology of the island of Raasay. *Proc. Univ. Durham Phil. Soc.*, **9**, 246–259.

The geology of the Coronation Stone. *Trans. Perth Soc. Nat. Sci.*, **9**, 210–212. [Also *The Times (Coronation Supplement)*, May 11, 1937; and elsewhere.]

Note on recent temporary rock exposures within the City of Dundee. *Trans. Perth Soc. Nat. Sci.*, **9**, 190–192.

Note on the occurrence of garnet sands in the Tay estuary. *Trans. Perth Soc. Nat. Sci.*, **9**, 192–195.

Note on bentonite from Walsall, Staffordshire. In A. J. Butler, *Geol. Mag.*, **74**, 255–257.

1939

The progress of geology in 1938. *Encycl. Brit. Book of the Year 1939*, p. 283–284.

Brief guide to the exhibits, Geological Museum. London (H.M.S.O.), 40 p.

Notes on the geology of the Carse of Gowrie. In L. Melville *The Fair Land of Gowrie*, Coupar Angus, Culross, p. 199–205.

A visit to the Geological Museum. *Geol. Ass. Proc.*, **50**, 352–354.

1941

(WITH F. J. NORTH AND W. E. SWINTON) *Geology in the Museum*. Oxford University Press, for The Museums Association, 97 p.

1943

The Archaean rocks of the Rodil district, South Harris, Outer Hebrides. *Trans. Roy. Soc. Edinburgh*, **61**, 71–112.

1949

A prospector's handbook to radioactive mineral deposits. 28 p. London (H.M.S.O.)

1950

The mineralogy of some Nile sediments. *Quart. J. Geol. Soc. Lond.*, **105**, 533–534.

(AND J. A. E. BENNETT) The uranium deposits of the Tete district, Mozambique. *Mineral. Mag.*, **29**, 291–303.

1951

(AND S. H. U. BOWIE) On thucholite and related hydrocarbon-uraninite complexes, with a note on the origin of the Witwatersrand gold ores. *Bull. Geol. Surv. Gt. Brit.*, **3**, 1–19. [Also *Rhodesian Mining J.* (1951).]

The distribution of radioactivity. *Mining Mag. (London)*, **85**, 329-340. [Also *Queensland Gov. Mining J.*, p. 410-418 (1952).]

1952

On the hydrothermal origin of the rand gold ores. *Résumés Commun. 19 Int. Geol. Congr., Algiers*, 82-83.

Successes in search for uranium in the Commonwealth. *New Commonwealth*, **24**, no. 11, 515-518. [Also *Mining Ind. Mag. S. Afr.*, 3-7, and elsewhere.]

1953

The gold-uranium ores of the Witwatersrand. *Mining Mag. (London)*, **88**, 73-85. [Also *Mining Ind. Mag. S. Afr.* (1953), *Rhodesian Mining J.*, 285-289, 319-323, 349-353 (1953).]

Reports of the Atomic Energy Division. *Sum. Progr. Geol. Surv. Gt. Brit. for 1951-1954*.

1954

Ore genesis of Northern Rhodesian copper deposits. (discuss.) *Trans. Inst. Mining Metal.*, **63**, 244-250, 256-258.

(AND D. ATKIN) On the occurrence of uranium in phosphate rock. *C.R. 19 Int. Geol. Congr. Algiers*, **11**, 13-31.

(WITH S. H. U. BOWIE) The radioactivity of fossil bones, with special reference to the age of the Piltdown remains. *Proc. Geol. Soc. Lond.*, **1514**, 116-119.

(AND D. R. A. PONSFORD) On the occurrence of uranium in coals. *Mining Mag. (London)*, **91**, 265-273. [Also *S. Afr. Mining Eng. J.* 721-729; *Queensland Gov. Mining J.*, **56**, 402-414.]

1955

(AND M. E. COSGROVE) On the impersistence of uraninite as a detrital mineral. *Bull. Geol. Surv. G. B.*, **10**, 74-80.

(WITH J. E. T. HORNE) The age of the mineralization of the Witwatersrand. *Bull. Geol. Surv. Gt. Brit.*, **10**, 58-73.

The raw materials of atomic power. *Discovery*, **16**, 234-236.

(WITH S. H. U. BOWIE) The radioactivity of the Piltdown fossils. *Bull. Brit. Mus. (Nat. Hist.), Geol.*, **2**, 276-282.

The mineralization of the Witwatersrand. *Mining Mag. (London)*, **92**, 152-156.

(AND S. H. U. BOWIE) Methods of prospecting for uranium and thorium. *Mining Mag. (London)*, **93**, 137-141 [Also *S. Afr. Mining Eng. J.*, **66**, 3-7; *Proc. Int. Conf. Peaceful Uses At. Energ. U.N.*, **6**, 659-662, 1956].

The concentration of uranium by carbon compounds. *Econ. Geol.*, **50**, 879-880; **51**, 724-725.

1956

The radioactive mineral resources of Great Britain, the Central African Federation, and the British Colonies (3 papers). *Proc. Int. Conf. Peaceful Uses At. Energ. U.N.*, **6**, 204-210.

James Frew Scott: obituary notice. *Proc. Geol. Soc. London*, **1541**, 141-142.

The economic geology of thorium. *Mining Mag. (London)*, **94**, 197-208.

Radioactive minerals. *Mining J. Ann. Rev.*, 55-58.

The occurrence and origin of gold and radioactive minerals in the Witwatersrand System: Discussion. *Trans. Geol. Soc. S. Afr.*, **58**, 232-236. [Also *Uranium in South Africa, Johannesburg* (1957), **1**, 197-201.]

1957

The World's Uranium. *New Scientist*. Feb. 21, 1957, p. 9-11. [Also *Der Monat* (Berlin) and *Elseviers Weekblad* (Amsterdam)].

Emeritus Professor C. K. Leith: Obituary notice. *Proc. Geol. Soc. London*, **1554**, 133-134.

The geochemical approach to prospecting for minerals. *Mining Mag. (London)* **97**, 9-16. [Also in *The Analyst*, October, 1957, and in *Modern Analytical Chemistry in Industry*, Heffer, 1958, p. 228-237.

On the occurrence of uranium in ancient conglomerates. *Econ. Geol.*, **52**, 668-693.

Radiogeology in Russia: A review of some recent research. *Mining Mag. (London)*, **97**, 265-273.

The diamond fields of Yakutia: A review and appraisal. *Mining Mag. (London)*, **97**, 329-338.

The search for uranium. *The Times Brit. Colon. Rev.* Dec. 10, 1957, p. 8-11.

1958

Geology at Geneva: A report on the United Nations Conference. *Mining Mag. (London)*, **99**, 137-142, 203-209.

Uranium in ancient conglomerates: A reply. *Econ. Geol.*, **53**, 887-889.

1959

How old is the Cambrian system? *Nature*, **183**, 768-769.

Further observations on uraniferous conglomerates. *Econ. Geol.*, **54**, 1316-1320.

The geological time scale. *Nature*, **184**, 1310, 1473.

1960

Some aspects of radiogeology. *Liverpool Manchester Geol. J.*, **2**, 311-340.

The present state of the Witwatersrand controversy. *Mining Mag. (London)*, **102**, 84-95, 149-159, 222-229.

Rejuvenation of pitchblende in Hercynian ore deposits. *Econ. Geol.*, **55**, 383-386.

Dr. W. F. P. McLintock: Obituary Notices. *Nature*, **186**, 200. [Also *Year Book Roy. Soc. Edinburgh.*, **1961**, 23-26.]

Transportation of uraninite in the Indus River, Pakistan: Discussion. *Trans. Geol. Soc. S. Afr.*, **63**, 95-96.

The mineralized conglomerates of Blind River. *Econ. Geol.*, **55**, 1561-1565.

Age of the Cambrian System. *Nature*, **187**, 1020-1021.

1961

The kolm deposits of Sweden. *Mining Mag. (London)*, **105**, 201-207.

1962

Geology in the service of mankind. *Impact Sci. Soc.*, **12**, 83-101 [Also *Sci. Culture*, **28**, 448-456.]

The origin of some strata-bound sulphide ore deposits. *Econ. Geol.*, **57**, 265-274.

Further remarks on biogenic sulphides. *Econ. Geol.*, **57**, 1134-1137.

On the cobalt: nickel ratio in ore deposits. *Mining Mag. (London)*, **106**, 78-85.

On uraniferous fish-bone beds. *Mining Mag. (London)*, **106**, 201-203.

Some genetic problems of the Dzhzhkazgan copper ores. *Mining Mag. (London)*, **107**, 215-217.

Uraninite in Witwatersrand bankets: Discussion. *Trans. Geol. Soc. S. Afr.*, **64**, 47-49.

Uraninite-scheelite placers of the River Indus. *Econ. Geol.*, **57**, 456-457.

Relation of mineralization to sedimentation at Mufulira: Discussion. *Trans. Inst. Mining Metal.*, **72**, 196–201.

1963

The Precambrian atmosphere. *Nature*, **197**, 893–894.

Phosphate deposits of Precambrian age. *Mining Mag. (London)* **109**, 205–208.

Problems of post-magmatic ore deposits. *Mining Mag. (London)*, **109**, 283–288. [Also in *World Mining* and elsewhere.]

1964

Further remarks on biogenic sulphides. *Econ. Geol.*, **59**, 938–939.

Uniformitarianism and ore genesis. *Mining Mag. (London)*, **110**, 176–185, 244–253.

The chemical history of the Earth. In A. P. Subramaniam and S. Balakrishna. eds. *Advancing Frontiers in Geology and Geophysics*. **Krishnan vol.** Indian Geophys. Union, 191–203. Hyderabad, India.

On diamantiferous diatremes. *Econ. Geol.*, **59**, 1368–1380. **60**, 1735–9 (1965); **61**, 786–790 (1966).

Uranium in ancient conglomerates: A review. *Econ. Geol.*, **59**, 168–177.

1965

The mode of origin of banket ore-bodies. *Trans. Inst. Mining Metal.*, **74**, 319–338, 489–492, 844–857.

A possible mode of origin of strata-bound copper ores. *Econ. Geol.*, **60**, 942–954.

Geochemical aspects of atmospheric evolution. *Proc. Nat. Acad. Sci. U. S.*, **53**, 1194–1205.

Dr. W. T. Harry: obituary notice. *Proc. Geol. Soc. London*, no. 1618, 115–116.

Dr. K. A. Vlasov: obituary notice. *Proc. Geol. Soc. London* no. 1628, 209–210.

1966

Selenium in Witwatersrand bankets. *Trans. Inst. Mining Metal. (Sec. B. Appl. Earth Sci.)*, **75**, B108.

Some genetic relationships between ore deposits and evaporites. *Trans. Inst. Mining Metal. (Sec. B. Appl. Earth Sci.)*, **75**, B216–B225, B300–B304.

1967

The kimberlites of the U.S.S.R. In P. J. Wyllie, ed. *Ultramafic and Related Rocks*. John Wiley & Sons, New York, p. 251–261.

The so-called 'cognate xenoliths' of kimberlite. In P. J. Wyllie, ed. *Ultramafic and Related Rocks*. John Wiley and Sons, New York, p. 342–346.

International Association on the Genesis of Ore Deposits: Symposium at University of St. Andrews, Scotland, September, 1967. *Trans. Inst. Min. Metal. (Sec. B: Appl. Earth Sci.)* **76**, 16–18, B219, 221–222.

1968

International Association on the Genesis of Ore Deposits (IAGOD). 2nd Symposium of IAGOD, St. Andrews, Scotland, September 8–17, 1967. *Geol. Newsletter*, **1967** (No. 4) 33–38.