

## OBITUARY

**Lieut-Colonel d'aviation FRANÇOIS BASTIN**, the Belgian Air Force and Antarctic meteorologist, died on 6 October 1969, following a motor accident in which his wife and a son were also killed.

Bastin was born in Angleur, Belgium, on 26 November 1920. At the beginning of the Second World War, he volunteered for military service and, in June 1942, escaped to Spain from occupied Belgium. After internment in Spain, he reached England, where he joined the Belgian section of the Royal Air Force (Meteorological Branch). Early in 1945, he joined the inspectorate general of the Belgian Air Force and, continuing meteorological training, became chief of the Belgian meteorological service at Evere, a post he held from 1948 to 1958.

In 1957, he organized the meteorological section of the first Belgian IGY Antarctic expedition and became a member of the Belgian IGY Committee. He was leader and meteorologist on the second Belgian Antarctic expedition, 1959-60, at "Base Roi Baudouin" and also led a summer traverse to Sør Rondane mountains. On his return, he became chief of operations of Centre National de Recherches Polaires de Belgique and, since 1966, had also been secretary of the SCAR Working Group on Logistics (SCARLOG). His enthusiasm and special knowledge enabled him to produce the *SCAR Telecommunications Manual*, a compilation of the greatest practical value.

Paul-Emile Victor writes of him: "Most *in memoriam* tributes tend to be alike. They mourn the passing of a good friend, a cheerful companion, an outstanding personality, an efficient organizer, and a persuasive promoter. There are hosts of Frank Bastin's friends and co-workers who will vouch that he was all of these things and who sadly realize that he cannot be replaced in any category. I, who have worked with him on SCARLOG, remember his enthusiasm, the logic and lucidity of his mind, the faultlessness of his organization—and I know that, for me, he will be irreplaceable."

**THOMAS ERIK BERG**, an officer of the Research Council of Alberta, was killed on 19 November 1969 in a helicopter accident on Mount Newall, near Wright Valley in southern Victoria Land, Antarctica. He was on a leave of absence from the council to continue investigations for the University of Wisconsin that he had initiated during the United States Antarctic Research Program in 1960.

Berg was born at La Crosse, Wisconsin, on 13 September 1933. After graduation from high school in 1951, he attended La Crosse State College for two years. From 1953 to 1955 he served as a radar petty officer in the United States Navy, and then enrolled in the University of Wisconsin at Madison. He received the BSc degree with honours in June 1957 and planned to complete his thesis for a PhD in geology in 1970.

While an undergraduate, Berg worked closely with Professor Robert F. Black and began a long-term study of permafrost and patterned-ground features in Antarctica. Since 1960-61, either Black or Berg usually led the annual Wisconsin summer field party to make direct measurements of the growth of some 500 ice-and-sand wedges in the soil of Ross Island and the dry valleys of Victoria Land. These observations were supplemented by micrometeorological data from three automatic recording stations which were established in the summer of 1960-61; he continued field work through the 1961 winter at McMurdo station and returned to the McMurdo area in 1962-3 and 1963-64. In 1963 he was the geologist of the Antarctic Peninsula Reconnaissance Party mounted by the National Science Foundation to select a possible site for Palmer Station, then in its initial planning phase. After joining the staff of the Research Council of Alberta in 1965, Berg continued his study of permafrost and work on the glacial history of southern Alberta and the geology of the Edmonton area. In 1967-68, he participated in the Steele Glacier Expedition to the Yukon. The expedition on which Berg met his death was to have been the last of the ten-year programme of the University of Wisconsin.

Berg had collaborated on a number of papers on Antarctic geology and his unpublished report on the 32 sites he examined on the Antarctic Peninsula, January-March 1963, reveals the possession of a keen and thorough intellect, well grounded in the academic and traditional knowledge of his calling, but alert to the practicalities of setting up and maintaining polar installations. In a short but distinguished career, Berg left his mark on the United States Antarctic Research Program.

P. M. Smith

**Captain FRED J. BERNSTEIN**, Assistant Chief of Staff for Operations and Plans and Special Projects Officer, United States Naval Support Force, Antarctica, died after a protracted illness on 5 August 1969, at the Naval Hospital, Bethesda, Maryland. He had joined the staff of the Naval Support Force in January 1968.

Captain Bernstein was born in Brooklyn, New York, on 4 July 1926 and, after completing his early education in Brooklyn schools, he entered Tufts University, Medford, Massachusetts. He was commissioned an ensign in the United States Navy after graduation from Tufts in 1946 and served on board minesweepers and a destroyer escort for several years. He became a naval aviator in March 1953, seeing duty with patrol squadrons and elements of the Atlantic Fleet, and was appointed Commanding Officer of United States Navy Training Squadron Six in January 1966.

One of the most significant contributions to Antarctic research made by Captain Bernstein during his brief career was his assistance in extending the aviation capability of the United States logistic forces. For the first time United States trans-continental flights in support of field operations were possible through refuelling of aircraft at the stations of other nations. He was a member of the United States delegation to the Antarctic Treaty Meeting of Experts on Logistics in Tokyo, Japan, in 1968.

P. M. Smith

**VITALIY IVANOVICH BODYLEVSKIY** was born on 26 April 1898, near Orel, and died on 9 August 1968. Between 1915 and 1921, he completed his studies in the Gorniy Institut [Mining Institute] at Leningrad, where he was later to hold a post as lecturer. In 1955, he became Professor of Historical Geology and made his name as a talented teacher. His scientific activity was concerned with the stratigraphy and fauna of Jurassic and Cretaceous deposits, particularly in the northern regions of the USSR. He studied and described ammonites and belemnites from Spitsbergen, Novaya Zemlya, the Pechora region, the eastern slopes of the northern Ural Mountains, the basin lowlands of the Yenisey, Anabar, Olenek and Lena rivers, and also of the Khatanga depression and the north-eastern regions of the country. He took an active part in the work of the stratigraphic committee of the USSR on the Jurassic and Cretaceous and of other Soviet and international bodies dealing with the Mesozoic stratigraphy. He was the author of some 100 scientific papers.

**FRANK PHILIP BOWDEN**, Professor of Surface Physics at the Cavendish Laboratory, University of Cambridge, died in Cambridge, after a long illness, on 3 September 1968.

Bowden was born in Tasmania on 2 May 1903 and educated at the University of Tasmania. He came to Cambridge in 1927 as a research student and, apart from the Second World War, spent the rest of his working life there. His early researches under Sir Eric Rideal were on electrolytic processes and catalysis but, partly under the influence of Sir William Bate-Hardy, he turned his attention to physical and mechanical aspects of surface interactions. He had always been a keen mountaineer and skier and he tells us, in one of his notes, how he was once snow-bound in the Alps and began to wonder why the friction of skis on snow and ice is usually so low. This led to a series of fundamental studies on the friction of snow and ice that still remain classics. The general view was that such low friction was due to the formation of a thin lubricating film of water between the sliding surfaces. Bowden's work (with T. P. Hughes), in which he dissolved a little electrolyte in the ice, showed that this was indeed so. During sliding there was a marked drop in the electrical resistance of the surface layers of the ice as the molten film formed. The older school held the opinion that pressure-melting was responsible. Simply by using sliders of different thermal conductivities Bowden showed that, in general, this could not be true. The main cause was the heating of the surface layers of the ice by the sliding process itself. This piece of research shows all the characteristics of Bowden's science at its best—the elegant, original and direct experimental approach, the unerring choice of the relevant experiment and the uncluttered nature of the conclusions.

Bowden always maintained that it was sensible and pleasurable to choose a research field that matched one's own outside interests. Certainly he continued to remain attached to the problems of ice and snow, both as a sport (he was an excellent skier) and as a subject of laboratory research. He studied the adhesion of ice and, in 1953, published a paper on the use of PTFE as a low-friction surface for application to skis. This attracted, and continues to attract, very wide interest amongst ski and toboggan enthusiasts. At the time

of his death he was actively involved with his colleagues in studying the creep of ice and the friction of ice at very low sliding speeds.

During the Second World War, Bowden opened a laboratory in Melbourne, which later became the Division of Tribophysics of CSIRO, to tackle lubrication and bearing problems relevant to the Australian war effort. On his return to Cambridge, he re-established his research group which is now known as "Surface Physics". It continues, to a large extent, to maintain the research traditions established by him.

David Tabor

**Professor HIROBUMI OURA**, Director of the Institute of Low Temperature Science, Hokkaido University, and a notable figure in Japanese ice studies, died suddenly on 11 March 1969.

He was born on 23 February 1921 at Hiroshima and graduated in physics from Tokyo Imperial University in 1942. In 1943 he joined the Institute of Low Temperature Science at Hokkaido University, where he changed his studies from optical spectroscopy to snow and ice, becoming, in 1958, a full professor and head of the meteorology section of the Institute.

He was a member of the Japanese Antarctic Research Expedition, 1961-62, and wintered at "Syowa" station, carrying out ice-thickness measurements and gravity distribution observations during a traverse to lat 75°S, long 38°E. His later work was on blizzards and drifting snow. He was made director of the institute in 1968.

**ERNEST FREDERICK RELF**, FRS, Principal of the College of Aeronautics, Cranfield, from its inception in 1946 until 1951, died on 25 February 1970 at the age of 81.

He was born on 2 October 1888 and educated at the Portsmouth Royal Dockyard School and the Royal College of Science, joining the scientific staff of the National Physics Laboratory in 1912 and serving as Superintendent of its Aerodynamics Division from 1925 to 1945.

He twice visited the Arctic with parties from Oxford University. In 1923 he was physicist, surveyor and radio-operator of the Merton College (Oxford) Expedition to northern Spitsbergen and took part in an attempt to circumnavigate Nordaustlandet in *Terningen*. Heavy ice and a broken propellor frustrated the venture, but the ship reached Repøyane in the north and Ulvebukta in the south of the island before returning to Billefjorden to collect the party that had sledged across Ny Friesland. The following year, he returned with the Oxford University Arctic Expedition, 1924, again being concerned with physics, survey and radio. He accompanied the reconnaissance cruise of *Polar Bjørn* along the south and east coasts of Nordaustlandet and carried out a survey of the area around Oxfordhalvøya, at the head of Wahlenbergfjorden.

An account by him of the cruise of *Terningen* appeared in the *Geographical Journal*, Vol 64, No 3, 1924, p 204-10 and short notes on magnetic observations and the use of radio on expeditions in the *Geographical Journal*, Vol 66, No 2, 1925, p 129-30. He also contributed an appendix on the use of radio to George Binney's *With seaplane and sledge in the Arctic* (London, 1925).

**DUNCAN STEWART VII**, Professor of Geology and Chairman of the Department of Geology at Carleton College, Minnesota, died suddenly on 5 November 1969 at Northfield, Minnesota.

Stewart was born on 2 October 1905 and attended the University of Michigan (BA in 1929 and PhD in 1933) and Brown University (MSc in 1930). He joined the faculty at Carlton College in 1933 and remained with it for the rest of his life.

His life-long interest in Antarctic petrography, which grew with his reputation as an Antarctic petrologist, began with studies of rocks from Admiral Byrd's first three Antarctic expeditions and spread to include work on a number of earlier collections—Scottish, French, German and Swedish—as well as material from recent collections. In 1960-61, he spent a summer in the Ross Sea area. There his contribution to Antarctic petrology was marked by the naming of Stewart Hills, in lat 84°12'S, long 86°W, by the United States Board on Geographic Names.

In addition to university work and the publication of numerous papers in scientific journals, he spent many summers carrying out geological surveys for private concerns in many parts of the world—for the last six years in the jungles of Costa Rica.

In 1956, Stewart spent a study year at the Scott Polar Research Institute, where his high spirits and generous enthusiasms are remembered with affection.

**MARTIN J. COETSEE**, Head of the Antarctic Division of the Department of Transport, South Africa, died on 10 March 1969. He was born on 9 April 1922 and was employed in the Wheat Board, and in private firms before joining the Department of Transport, Division of Road Transportation, Work Study and Civil Aviation. He became head of the Antarctic Section in 1965.

**A. A. S. GROBLER**, mechanical technician, and **J. G. S. SEYFFERT**, radio technician, died from exposure on South Peak, Gough Island on, or about, 12 July 1969. The two men were returning to base from a visit to the old base site and were caught in storms; search parties, including one from Tristan da Cunha, found the bodies three weeks later.

**G. I. MACKIE**, motor mechanic attached to SANAE 10, was killed in a crevasse accident on 3 December 1969 while accompanying a party to repair a broken-down tractor in Borgmassivet.