

Obituary

Keith Richard Greenaway, who died on 21 May 2010, aged 94, established himself early in his career as the pre-eminent authority in north America on Arctic air navigation. He was only a flight lieutenant, RCAF, with 11 years service when he published his *Arctic air navigation* (1951), which immediately became the standard textbook in its field. The book deals with all aspects of air navigation, bringing information scattered in various publications together with the author's already very wide practical experience. The heart of the book details the limitations of the magnetic compass in high latitudes and sets out procedures in the reliable Asco-Gyro system of navigation, which Greenaway did so much to develop and which involves the determination of aircraft heading by astro compass and the maintenance of direction by gyro compass, continuously corrected for gyro-drift.

Greenaway, who was born on 8 April 1916, joined the Royal Canadian Air Force in May 1940, qualified as a wireless operator, and served as an instructor in this field for two years. He then qualified as a navigator, received his commission, and served the last two years of the war as a staff instructor at the Central Navigation School, Rivers, Manitoba.

During the winter of 1945–1946, Greenaway was attached to the US Navy for experimental flights over the north Atlantic to test the value of variations in altimeter pressure as a navigational aid, and later received a commendation from the US Navy for his work. For the next two years he was associated with the US Air Force on experimental flights from bases at Edmonton and Fairbanks for the purpose of testing a low frequency navigational system. In the spring of 1946, he was one of the navigators in the first US military aircraft to fly over the North Pole.

From 1948 to 1954, Greenaway was seconded to the Defence Research Board, Ottawa, with which he had already been associated in the development of a Twilight computer, a navigational aid used by the RCAF and other air forces. He continued to work on navigational problems, making numerous Arctic flights extending to the North Pole. He left this post to become the first Canadian officer to be seconded to the US Strategic Air Command under its formidable commander General Curtis LeMay, serving for two years on Arctic flights in both the B47 and the eight-engined B52 bombers.

In 1956, Greenaway returned to Ottawa as a wing commander to work in the Directorate of Plans and Programmes. In August 1958, he was once again attached to the US Navy, this time for the novel purpose of navigating a USN airship on its polar test to the floating ice island T-3, which he himself had first identified in April 1947. Later in the same year, he was attached to the Canadian Department of External Affairs as air adviser on the Canadian delegation to the ten-power conference in Geneva on measures for preventing surprise air attack. On promotion to group captain in 1959, he was posted to command the RCAF Central Navigation School, where amid other duties he instituted an aerospace systems course for the Canadian forces and perfected a new technique for measuring direction in the polar regions. Four years later he was

transferred to command the RCAF station at Clinton, Ontario. It was in mid-1960s that the Canadian forces became integrated under reforms instituted by Paul Hellyer, Minister of National Defence in the Liberal Government. Greenaway was one of those officers who welcomed the change, surprisingly to some of his friends, and he was happy to call himself colonel and to exchange his air force blue for a green uniform.

In 1967, Greenaway was again attached to the Department of External Affairs and appointed air adviser to the Chief of the Air Staff, Royal Malaysian Air Force, in the rank of brigadier general. Based at Kuala Lumpur but travelling widely, Greenaway advised on all aspects of organisation, management and training for the RMAF. His services were recognised by the Malaysian Government by the award of the Johan Mangku Negara. Within a year returning from Malaysia, he retired from the Air Force in March 1971.

In civilian life Greenaway's knowledge and experience of the Canadian Arctic were eagerly sought by the Department of Indian and Northern Development in order to draft guidelines and priorities for federally supported scientific research in northern Canada. He later served for three years as senior science adviser to the department. From 1980–1984, he served as chairman of the Board of Land-Sea Resources of Canada Ltd, a consortium of Canadian companies specialising in remote sensing and related surveys.

In addition to his book and numerous papers on Arctic air navigation, Greenaway was co-author of *An aerial reconnaissance of Arctic North America* (1948) and of *Arctic Canada from the air*, with the late Moira Dunbar (1956), which made full use of air photographs of vast, mainly unmapped regions as these had become available. He also edited *Science and the north* (1973) and contributed papers to symposia with northern themes.

His services to Arctic aviation and other activities were recognised by a number of awards including: the President's Prize of the Royal Meteorological Society (Canadian Branch), the Thurlow Award of the US Institute of Navigation, the McKee Trans-Canada Trophy, and the Massey Canada's Aviation Hall of Fame in 1973, and was appointed a Member of the Order of Canada (CM) in 1976. He was also a Fellow of the Arctic Institute of North America, and held an Honorary DSc from the Royal Roads Military College. With co-author M.D. Gates in 2009, he updated all gus work in Polar Air Navigation.

Keith Greenaway was modest and quietly spoken, yet none could doubt his authority gained from hard won experience and largely self-acquired knowledge. He was greatly respected by all ranks of the RCAF, and he remained a warm and loyal friend to all his Arctic colleagues. He is well remembered by a succession of British High Commissioners to Canada and other diplomats, treated annually to special air tours of the Arctic, which for many years he helped to plan, often serving as navigator. In his younger days he had been a notable ice-hockey player. Greenaway is survived by his wife Hazel. There were no children of the marriage.
Geoffrey Hattersley-Smith