

YVES OSCAR FORTIER (1914–2014)

Yves Fortier, a geologist of unusual versatility, former director of the Geological Survey of Canada (GSC), and a pioneer of the modern study of Canadian High Arctic geology, died in Ottawa on 19 August 2014, at age 100.

Yves Oscar Fortier was born in Quebec City on 17 August 1914, two weeks after Germany declared war on France at the outbreak of World War I. His early education was a classical one, at the Jesuit Séminaire de Québec; from there, he went on to Laval University, obtaining a BA in 1936. One of his teachers, Fr. J.W. Laverdière, introduced Yves to geology. Entering Queen's University in 1936, he chose the Geology option in Mining Engineering. He was awarded a BSc in 1940. That same year, Yves began a study of the mineral chromite—important in steelmaking, particularly for the war effort—while employed as a field assistant to Dr. C.H. Stockwell of the GSC, who was investigating the Appalachian rocks of the Eastern Townships of Quebec. This work led to the award of an MSc by McGill University in 1941. Yves continued his investigations of potential chromite deposits in the southern Quebec Appalachians, eventually focusing on geological mapping of the Mount Orford area for the GSC. This project formed the subject of a PhD dissertation at Stanford University, where Yves spent two academic years from 1941 to 1943. In 1943 Yves joined the GSC full-time as a Junior Wartime Technologist and began work in the Archean-age Precambrian shield of the Ross Lake area, northwest of Yellowknife, Northwest Territories. After a second summer at Ross Lake, Yves completed mapping of the Mount Orford area in the fall of 1944. His PhD degree was conferred by Stanford in 1946. Yves spent the 1946 field season studying uranium mineralization in the Port Radium area of Great Bear Lake, Northwest Territories.

Yves began the Arctic phase of his career in 1947, when he was directed to evaluate the potential for local use of coal deposits in the area of Pond Inlet, northern Baffin Island. Yves planned to reach Pond Inlet on an RCAF Canso aircraft being used by a group of geophysicists from the Dominion Observatory, who were investigating Earth's magnetic field in the Arctic Islands (Operation Polco). At the end of the field season, he was to return south on the Hudson Bay Company's supply ship *Nascopie*. In July, however, the *Nascopie* was wrecked near Cape Dorset, and Yves decided to remain with the Operation Polco team and carry out geological work during ground stops, as well as making observations from the air. Thus did Yves become the first GSC geologist to penetrate the Arctic Islands by air. He was profoundly impressed by the superb exposure of rocks and structures in treeless terrain that was unexplored geologically.

In 1949 Yves investigated the Precambrian granitic terrane of Meta Incognita Peninsula, southern Baffin Island, using two Acadia-type fishing boats—one on the Frobisher Bay coast, the other on the Hudson Strait side—and pack dogs on land, respectively crewed and handled by Inuit.



Yves Oscar Fortier, November 1966. (Photo credit: F.J. Cooke, Geological Survey of Canada.)

By now Yves was the designated Arctic Islands expert at GSC. From a study of air photographs, recently made available, Yves recognized that the folded sedimentary rocks of Ellesmere and Axel Heiberg Islands extended through Cornwallis Island, to the south and east of which lay the platform sediments of Somerset and Devon Islands. Clearly, Cornwallis Island was a key element in the geological architecture of the Arctic Islands. The junction of fold belts and plains was widely known for its petroleum potential. Furthermore, early explorers had reported petroliferous rocks in several places in the Arctic Islands. Lastly, Cornwallis Island, strategically located in the central part of the Islands, featured an airfield at Resolute Bay.

As a result, Yves proposed a circumnavigation of Cornwallis Island (7000 km²) by canoe to take place in 1950 and invited Raymond Thorsteinsson, a graduate student in geology and paleontology, and Trevor Harwood of the Defence Research Board, a geologist and former Hudson Bay Company clerk with five years' Arctic experience, to accompany him. A 7 m freighter canoe was duly transported to Resolute in the weapons bay of an RCAF Lancaster bomber. After waiting for the sea ice to clear, Yves and his party set off on 21 July, their canoe laden with some 1800 kg of supplies and powered by a 5 hp outboard motor. The counterclockwise circumnavigation was completed when they arrived back in Resolute on 22 August. An account of this remarkable voyage, accomplished without proper maps, has been given by Harwood (1951).



A foretaste of the future? Yves immersed in paperwork on Operation Franklin in 1955.

The geology of Cornwallis Island proved to be considerably more complicated than anticipated and required much further work. Yves turned the project over to Ray Thorsteinsson, thus launching him on his own illustrious career with the GSC (Nassichuk and Frisch, 2012).

In the winter of 1953–54, the GSC received a request from the Department of Indian Affairs and Northern Development for a significant effort to substantiate the petroleum potential of the Arctic Islands. Yves responded by proposing a full-scale, air-supported geological reconnaissance concentrated on the Queen Elizabeth Islands in the spring and summer of 1955. Thus was born Operation Franklin, planned, organized, and led by Yves Fortier.

Equipment and supplies were brought to Resolute on the 1954 sea lift. In May to early June 1955, materiel was cached by a ski-wheeled DC-3 aircraft at three sites on Ellesmere, Ellef Ringnes, and Melville Islands, where base camps were to be established. Yves and 10 other geologists and paleontologists, supported by 10 student assistants, participated in the fieldwork, which was conducted mainly by two-man teams on foot. Two Sikorsky S-55 helicopters were used chiefly for moving light camps and setting out small caches. This was the first time helicopters were employed in support of scientific work in the Arctic Archipelago.

Operation Franklin, which ran from early May to late September, surveyed some 250 000 km² of geologically unknown terrain. It was also important as an assertion of sovereignty in the High Arctic. Subsequent fieldwork, building on the results of Operation Franklin, spurred a decade-long petroleum exploration boom that began in the early 1960s.

After heading successively the GSC's Regional Geology and Economic Geology Divisions in the period 1958–64, Yves in 1964 was appointed 13th director of the Geological Survey of Canada. He was the first francophone to hold that position. His tenure was a time of considerable change,

upheaval even, in earth science, as the plate tectonic “revolution” gathered steam and the technology for analyzing and observing Earth rapidly advanced.

Yves remained director for nine years, during which the GSC grew and prospered. In 1973 he was appointed Special Advisor for Earth Sciences in the Department of Energy, Mines and Resources (EMR), and in 1975 he became the department's Assistant Deputy Minister for Science and Technology. Yves retired in 1976.

Yves Fortier's achievements were recognized by election to fellowship in the Royal Society of Canada (1953); award of the Massey Medal of the Royal Canadian Geographical Society (1964) and the Logan Medal of the Geological Association of Canada (1974); appointment to the Order of Canada as Officer (1980); and the naming of a mineral—yfortierite, discovered at Mont St-Hilaire, Quebec—after him. Yves was a founding member of the Geological Association of Canada and honorary member of the Geological Society (London) and the Société géologique de France.

Yves Fortier is survived by his wife Trudy, sons Georges and Marc, daughters Mimi and Claire, three grandchildren, and four great-grandchildren.

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