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Notable Canadian Women in the History of Geology

Barbara L. Sherriff and Shelley Reuter

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Issues in Canadian Geoscience:

Women in Geoscience

Notable Canadian Women in the History of Geology

Barbara L. Sherriff and Shelley Reuter
Department of Geological Sciences
University of Manitoba
Winnipeg, Manitoba R3T 2N2

INTRODUCTION

It is important to acknowledge the role of women in geoscience in the past, as these pioneers enabled women to be accepted in the field. In many cases, they overcame great personal difficulties and discrimination to succeed in their chosen careers, and in so doing, showed that women had the intellectual and physical capabilities to be geologists. Their stories need to be told so that geologists realize the significant contributions that women have made to geological sciences, and to dispel the myth that geology is a male domain.

Biographies are presented of five Canadian women geologists. Kate Rice was a prospector in northern Manitoba; Alice Wilson and Madeleine Fritz were the first female Canadian paleontologists; Helen Belyea was a stratigrapher and sedimentologist; and Gabrielle Donnay was a crystallographer and mineralogist.

KATHLEEN LINCOLN RICE (1883-1963)

Kate Rice was a prospector, dog trainer, hunter, trapper and scholar who was born in St. Mary's, Ontario. This amazing woman was not only the first female prospector in Manitoba and probably all of Canada, but also the only female dog musher in northern Canada. She worked in Manitoba's north for about 45 years, much of the time living, trapping, prospecting and travelling alone (L. Klassen, pers. comm., 1993). She was undaunted by the challenges of living in the bush of northern Manitoba, an impressive accomplishment even today. She was an outstanding student, who graduated with the gold medal in mathematics from the University of Toronto. She is credited with the discovery of a rich nickel deposit on Rice Island (B. Kobar, pers. comm., 1993), an ore deposit at Schist Lake, and feldspar on Walrus Island (Connolly, 1927).

ALICE WILSON (1881-1963)

Alice Wilson was born in Cobourg, Ontario and graduated from the University of Toronto with a B.A. Honours degree in modern languages and history in 1911. Despite severe gender discrimination, Wilson eventually completed her Ph.D. in invertebrate paleontology in 1929 at the University of Chicago. As a paleontologist with the Geological Survey of Canada, Alice Wilson studied the Ottawa-St. Lawrence Valley area for about 50 years and published many papers on the Ordovician fossils of this and other regions. In 1920 she explored the dangerous shoreline of Lake Winnipeg, Manitoba with Madeleine Fritz. Alice Wilson was appointed to the Royal Society of Canada in 1938, and was given an Honourary Doctorate (Law) from Carleton University in 1960.

MADELEINE ALBERTA FRITZ (1896-1990)

After finishing her B.A. in 1919, Madeleine Fritz became interested in geology, and a field trip to Manitoba with Alice Wilson inspired her to complete a Ph.D. at the University of Toronto and follow a career in geology. Fritz worked at the Royal Ontario Museum on fossils from the Toronto region, and also taught geology and paleontology at the University of Toronto (J. Burke, pers. comm., 1992). Having published more than 70 scientific papers, Fritz was elected as a Fellow in the Royal Society of Canada, the Geological Association of Canada, the Geological Society of America, and the Palaeontological Society. She was also awarded the Centennial Medal of Canada. After her retirement in 1967, Madeleine Fritz continued her studies

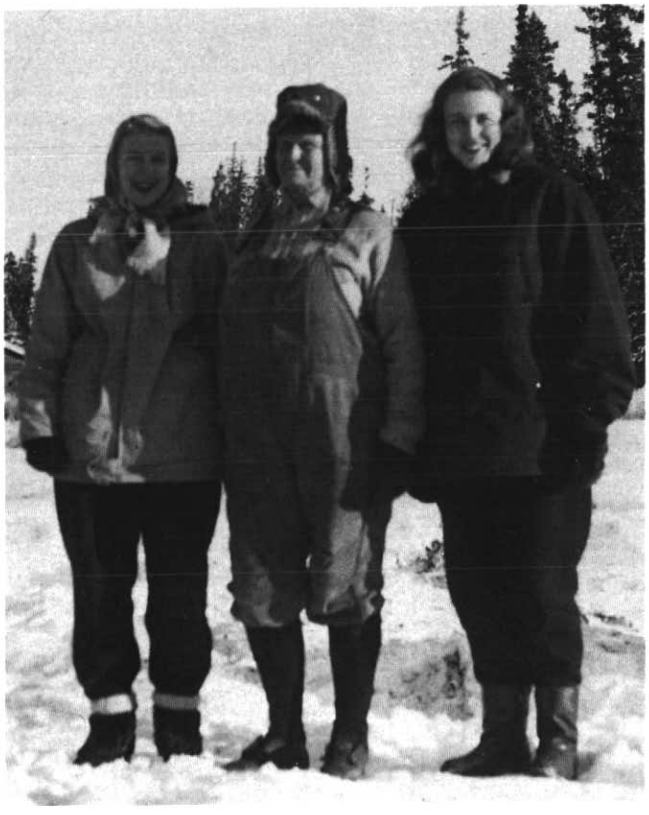

Figure 1 *Kate Rice (centre) (courtesy of Bart Kobar).*

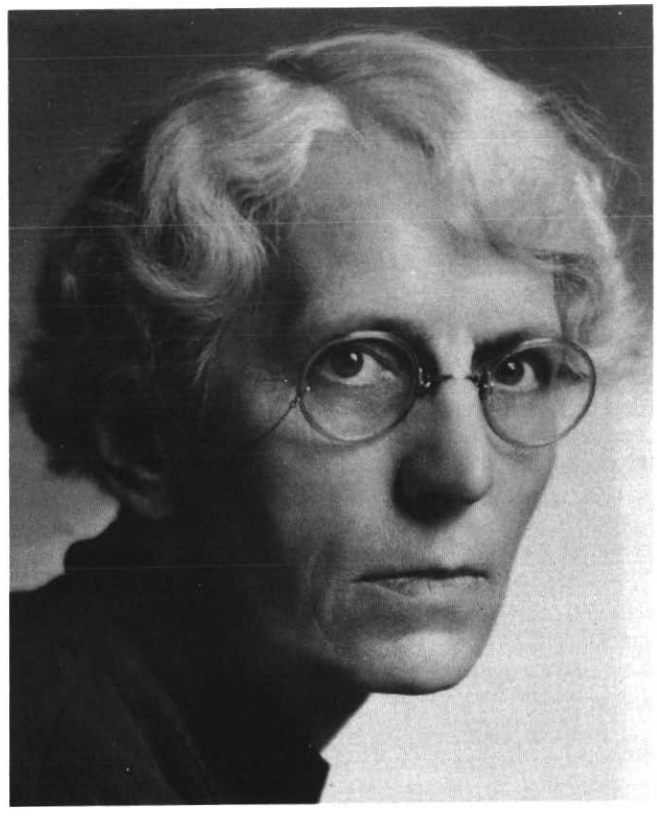

Figure 2 *Alice Wilson (courtesy of the Geological Survey of Canada).*

Figure 3 *Helen Belyea (courtesy of M.G. Ainley).*

Figure 4 *Gabrielle Donnay (Martin, 1989).*

on bryozoa and pursued her interests in human evolution and the origin of the Earth.

HELEN REYNOLDS BELYEA (1913-1986)

Helen Belyea was born in St. John. She completed a B.A. in languages and geology at the University of New Brunswick in 1934, an M.A. in geology in 1936 at Dalhousie University, and a Ph.D. at Northwestern University with her thesis entitled "The Geology of Musquach Area, New Brunswick." Belyea joined the Geological Survey of Canada as a sub-surface stratigrapher and field geologist in 1945. She focussed on the Devonian of the Western Plains, and in her first paper in 1952 she explored the facies relations in the Upper Devonian and the implications of the reef/off-reef sequences. In 1955, her paper outlining the southern margin of the reef complexes was the beginning of an extensive and important investigation into the problems of relationships in the upper part of the succession above the Woodbend reefs and biostromes. Helen Belyea was given many honours for her work, including an appointment as an Officer of the Order of Canada. She retired officially in 1975, but continued to work for several years as a Research Scientist Emeritus at the Institute of Sedimentary and Petroleum Geology.

GABRIELLE DONNAY (1920-1987)

Gabrielle Donnay (née Hamburger) emigrated to Los Angeles from Poland at the age of 17. She studied at the University of California in Los Angeles, graduating with the highest honours in chemistry, and an interest in crystallography. She completed her Ph.D. in 1949 at the Massachusetts Institute of Technology with her investigation into the non-centrosymmetric rhombohedral structure of tourmaline. In 1970, after 20 years with the Geophysical Laboratory, Carnegie Institution of Washington, she moved to Canada, becoming a member of faculty at McGill University. Gabrielle Donnay published 134 papers about crystal chemistry and structural crystallography, and together with her husband Jose Donnay, became internationally known for their compilation of crystallography *Crystal Data* (1954, 1963). She received many honours and awards for her excellence in mineralogy and crystallography, including the Past Presidents' Medal of the Mineralogical Association of Canada. The mineral **Gaidonnayite** [$Na_2ZrSi_3O_9.2H_2O$], discovered at Mont St. Hilaire, Quebec, was named after her.

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Women in Earth Science/Geology Departments of Canadian Universities: 1983-1992

G. Pe-Piper
Department of Geology
Saint Mary's University
Halifax, Nova Scotia B3H 3C3

ABSTRACT

The proportion of female students in Canadian earth science/geology departments has increased slowly in the past decade, from 20% to 28% at the B.Sc. and M.Sc. levels and at the Ph.D. level (based on small numbers) from 8% to a peak of 21% in 1991. The proportion of female faculty remains at less than 5% and only 13% of new faculty hirings since 1983 have been women. These percentages are similar to those in other physical science disciplines; they are higher than those in the United Kingdom, but lower than those in the United States. Vigorous action is required both at the elementary/high school and university levels to avoid wasting female talent and to ensure that female undergraduate students have role models among graduate students and faculty.

INTRODUCTION

It is well known that women are underrepresented among both students and academic staff in earth science/geology departments of Canadian universities. The purpose of this paper is: 1. to document the degree of under-representation and to see how it compares with other sciences, 2. to determine whether there has been any change in the representation of women among geology students (both undergraduate and graduate) since 1985, 3. to document the participation of women in hiring tenure-track faculty since 1983, and 4. to make some suggestions for improving the participation of women in university departments. This task has been attempted through an analysis of data provided by the Council of Chairs of Canadian Earth Science Departments (CCCESD), a questionnaire sent out to