in twenty M.Sc. and Ph.D. degrees.

The second grant does not include funds for a Senior Fellowship each year, but there is continued support for the library of the Arctic Institute, which is used extensively by the McGill Carnegie students. In the summer of 1956, at the beginning of the second program, ten scholars were in the field, ranging from the northeast part of Labrador to Aklavik and from Contwoyto Lake to Nettilling Lake. The fields of investigation were glacial geology, marine biology, physiography, limnology and fresh water biology, economic geography, and ornithology. In the summer of 1957 three Carnegie scholars and several of the previous years' grantees did field work in the North: C. I. Jackson, a United Kingdom citizen, worked out of McGill's Knob Lake laboratory on problems of short-wave radiation and reflection from the ground. His field work is part of a longer-term McGill program of research in micro-meteorology in the subarctic. Jackson later joined the McGill group of graduate students that are making up the winter party on the Canadian Defence Research Board's Expedition to Lake Hazen, Ellesmere Island, during the International Geophysical Year. M. T. Millett, a U. S. citizen, joined a party from the American Geophysical Society to Alaska, where his field work was part of International Geophysical Year investigations of glaciers and glacial geology. Finally, D. Steele, a Canadian, spent the summer on the Labrador coast, collecting and investigating anthipods.

SVENN ORVIG

Activities of the Geographical Branch in northern Canada, 1947-1957[1]

The Geographical Branch of the Department of Mines and Technical Surveys was created in 1947. Under its terms of references, part of its responsibility is the collection and analysis of geographical information on northern Canada, in particular the territories under the jurisdiction of the federal government.[1] In the decade since the Branch's inauguration, geographers have carried out various kinds of field surveys in the Canadian Arctic and subarctic, from the northern coast of Ellesmere Island to the Hudson Bay coastal plain in Ontario, and from the Alaska boundary to Labrador. These surveys have varied from parties formed entirely of geographers to individual shipboard observers or representatives on collaborative teams of scientists.

The collection of basic information on the vast unknown expanses of the Arctic is peculiarly suited to the application of geographic methods. Utilizing the trimetrogon and vertical photography carried out since World War II, geographers have applied sampling techniques in interpreting larger areas, making intensive field studies of representative terrain types and expanding them by use of the air photos in delimiting, describing and analysing physiographic regions. Studies in physical geography have been the backbone of the work of the Branch in the Arctic. Air photo interpretation keys have been prepared for 14 areas: Alert, Eureka, Mould Bay, Resolute, Mackenzie Delta, Darnley Bay, Coppermine, Bathurst Inlet, Boothia Isthmus, Wager Bay, Southampton Island, Kaniapiskau-Koksoak Rivers in Ungava, the Hudson Bay Railway, and the Kenogami River. Reports on the human geography of various areas were included in the field reports and are mainly unpublished; several studies in historical geography also resulted from the field surveys.

The choice of areas investigated in the first few years of Branch field activities was dictated partly by the requirements of federal government departments, partly by the presence of settlements which could be used as bases for operations, partly by the staff available and partly by the availability of air photo coverage. Because of these limitations, it was only in recent years that an integrated regional program of research could be established, allowing geogra-

[1]Published with the permission of the Director, Geographical Branch, Department of Mines and Technical Surveys, Ottawa.

[1]Nicholson, N. L. 1957. The Geographical Branch, 1947-1957. Can. Geog. No. 10: 61-68.

phers to specialize regionally. It is expected that this specialization will continue, to the end that regional monographs may be prepared after a number of years of field study in each of several regions.

Collaborative surveys with other scientists and organizations. Collaborative surveys were initiated early in the history of the Branch, mainly for reasons of convenience and transportation costs. J. L. Jenness was attacned to a scientific party including specialists in geodesy, geophysics, and botany, travelling by Canso aircraft in the western Arctic in 1948 and 1949.[1] B. Shindman accompanied another Canso party in 1949 in the western Arctic and in the same year, the Branch supported the NAUJA expedition to Foxe Basin.[2] The NAUJA group was led by T. H. Manning and included C. L. Merrill, geographer and engineer, R. W. Packer, geographer, D. B. Coombs, geographer and surveyor, C. A. Burns, geologist, W. K. W. Baldwin, botanist and A. W. Macpherson, cook and assistant zoologist. In 1948, P. Gadbois was attached to a party which crossed northwest Ungava by canoe from Povungnituk to Payne Bay,[3] and in 1951, Gadbois and J. S. Tener of the Canadian Wildlife Survey worked together in the vicinity of Eureka. The Branch assigned J. K. Fraser as the departmental representative on the Aklavik Relocation Survey team in the Mackenzie Delta in 1954.[1] W. G. Ross was employed by the Branch in 1957 to accompany M. Marsden of McGill University in a survey of the Baffin Island coast along northern Foxe Basin.

Observers on government and H.B.C. vessels. Geographers have accompanied ships on the joint Canada-U. S. Weather Stations Resupply Mission in the eastern Arctic from time to time, namely R. T. Gajda and T. R. Weir in 1948, Gajda in 1949, D. W. Kirk in 1950, R. J. E. Brown and L. Prior in 1951, W. C. Wonders in 1952, and W. A. Black in 1956 and 1957.[2] In 1948, G. A. Wood travelled on the Hudson's Bay Company vessel *Rupertsland* in the eastern Arctic and J. K. Fraser on tugs of the Northern Transportation Company on the Mackenzie River and the Hudson's Bay Company vessels *Fort Ross* and *Nigalik* in the western Arctic.[3]

In 1948, T. Lloyd (then head of the Branch) visited Resolute Bay on Cornwallis Island. D. W. Kirk was killed in 1950 in the crash of an RCAF Lancaster at Alert. In 1953 and 1954, N. L. Nicholson, then assistant director, visited field parties on Boothia Peninsula and in the Mackenzie Delta respectively.

Regional surveys composed of federal geographers. In 1948, J. B. Bird, accompanied by W. G. Dean, A. H. Laycock, and M. B. Bird, began his field studies in the central Arctic, working along the chain of lakes between Baker Lake and

[1]Jenness, J. L. 1952. Erosive forces in the physiography of western arctic Canada. Geog. Rev. 42: 238-252.

————1952. Problem of glaciation in the western islands of arctic Canada. Geol. Soc. Amer. Bull. 63: 939-952.

————1953. The physical geography of the waters of the western Canadian Arctic. Geog. Bull. No. 4: 32-64.

[2]Baldwin, W. K. W. 1951. Biological investigation of the 1949 Foxe Basin Expedition. Ann. Rept. Nat. Mus. Can., 1949-50 (Bull. No. 123), pp. 162-165.

Burns, C. A., and A. E. Wilson. 1952. Geological notes on localities in James Bay, Hudson Bay and Foxe Basin visited during an exploration cruise, 1949. Geol. Surv. Can. Paper 52-25, 16 pp.

Fraser, J. K. 1953. The islands in Foxe Basin. Geog. Bull. No. 4: 1-31.

[3]Gadbois, P. 1949. De la baie d'Hudson à la baie Ungava. L'Actualité Economique 25: 300-322.

[1]Fraser, J. K. 1956. Physiographic notes on features in the Mackenzie Delta area. Can. Geog. No. 8: 18-23.

[2]Black, W. A. 1957. A report on sea ice conditions in the eastern Arctic, summer 1956. Ottawa: Dept. of Mines and Tech. Surv., Geog. Branch, Geog. Paper No. 9, 21 pp.

[3]Fraser, J. K. 1949. Summer journey down the Mackenzie and along the western Arctic Coast, 1948. Arctic Circ. 2: 11-13.

Beverley Lake in the District of Keewatin.[1] In 1950, Bird, with Dean, M. B. Bird and W. D. Bell, traversed the southern coasts of Southampton Island,[2] and continued this study in 1952 with M. B. Bird in the Wager Bay-Repulse Bay area.[3] In 1954, J. B. and M. B. Bird worked in the Bathurst Inlet area,[4] and M. Marsden and G. Falconer traversed the mainland coast of Coronation Gulf between Rae River and Port Epworth, working from the settlement at Coppermine. These studies were extended in 1956 when J. B. Bird and M. Marsden investigated the area surrounding Contwoyto Lake.

The Mackenzie Delta and adjacent coastlands studies were begun in 1951 when J. R. Mackay, assisted by J. K. Fraser, carried out investigations in the Darnley Bay area.[5] Mackay continued this work in 1954, assisted by J. K. Stager and V. W. Sim, on the Geographical Branch schooner *Tuhlik* in the Delta and the Eskimo lakes.[1] In 1955, Mackay, with J. K. Stathers, travelled in the *Tuhlik* from Aklavik to Cape Bathurst, investigating the Liverpool Bay area and the lower Anderson River.[2] The *Tuhlik* was again utilized in 1957 when Mackay, with W. E. S. Henoch and W. C. Wallace, traversed the coast from the Delta to past Herschel Island.

Studies of the central Arctic Coast and adjacent islands were commenced by J. K. Fraser in the spring and summer of 1953 in the Boothia Isthmus area, accompanied by C. Laverdière.[3] In 1955, Fraser and B. Frebold studied the southeastern coastlands of Victoria Island, working from Cambridge Bay. Assisted by W. E. S. Henoch, Fraser worked along the south coast of King William Island in 1956 and carried out investigations in Sherman Inlet.[4]

---

[1]Bird, J. B. 1951. Physiography of the middle and lower Thelon Basin. Geog. Bull. No. 1: 14-29.

———1953. The glaciation of central Keewatin, N.W.T. Amer. J. Sci. 251: 215-230.

Dean, W. G. 1953. The drumlinoid features of the Barren Grounds, N.W.T. Can. Geog. No. 3: 19-30.

[2]Bird, J. B. 1953. Southampton Island. Ottawa: Dept. of Mines and Tech. Surv., Geog. Branch, Mem. No. 1, 84 pp.

[3]———1954. Postglacial marine submergence in central arctic Canada. Geol. Soc. Amer. Bull. 65: 457-464.

———1955. Terrain conditions in the central Canadian Arctic. Geog. Bull. No. 7: 1-16.

[4]———1955. Postglacial emergence of the land around Bathurst Inlet, N.W.T. Can. Geog. No. 6: 7-12.

———and M. B. Bird. 1957. Notes on potential building sites in Bathurst Inlet area, N.W.T. Ottawa: Dept. of Mines and Tech. Surv., Geog. Branch, Geog. Paper No. 8, 13 pp.

[5]Mackay, J. R. 1952. Physiography of the Darnley Bay area, N.W.T. Can. Geog. No. 2: 31-34.

———1953. Post-glacial drainage changes in the Darnley Bay area, N.W.T., Canada. Yearbook Assoc. Pacific Coast Geog. 15.

———Anderson River map area. Ottawa: Dept. of Mines and Tech. Surv., Geog. Branch, Mem. No. 5. In press.

Fraser J. K. 1952. Identification of Petitot's Rivière La Roncière-le Noury. Arctic 5: 224-234.

[1]Mackay, J. R. 1956. Mackenzie deltas — a progress report. Can. Geog. No. 7: 1-11.

Stager, J. K. 1956. Progress report on the analysis of the characteristics and distribution of pingos east of the Mackenzie Delta. Can. Geog. No. 7: 13-20.

[2]Mackay, J. R. 1956. Deformation by glacier ice at Nicholson Peninsula, N.W.T., Canada. Arctic 9: 219-228.

———1956. Notes on oriented lakes of the Liverpool Bay area, N.W.T. Revue Can. de Geog. 10: 169-174. Comment and reply in: Revue Can. de Geog. 11: 175-178.

———1957. Notes on small boat harbours, N.W.T. Ottawa: Dept. Mines and Tech. Surv., Geog. Branch, Geog. Paper No. 13, 11 pp.

[3]Fraser, J. K. 1957. Tracing Ross across Boothia. Can. Geog. No. 10: 40-60.

[4]———1957. Notes on birds observed in the central Canadian Arctic, 1953, 1955, and 1956. Can. Field-Nat. 71: 192-199.

Regional studies were made in the Queen Elizabeth Islands in the vicinity of the weather stations. Following Gadbois' field work at Eureka in 1951, he and C. Laverdière spent the summer of 1952 at Alert.[1] In the same year, J. R. Mackay and J. K. Stager carried out studies in southern and western Cornwallis Island.[2]

The Mould Bay area was investigated in 1955 by B. Robitaille and L. Hudon, while V. W. Sim and M. Marsden extended the Eureka study.[3] Robitaille and J. G. L. Trotier worked in eastern Cornwallis Island in 1956.

Studies were recommenced in the Foxe Basin area in 1957, when V. W. Sim and D. Bissett investigated the northern part of Melville Peninsula, W. G. Ross and M. Marsden worked in northern Foxe Basin and B. Robitaille and H. Wargon spent the summer studying the coastal areas of Foxe Peninsula on Baffin Island.

Subarctic field investigations. Summer surveys along the fringe of the Arctic include those of W. G. Dean on the Kenogami and Albany rivers in northern Ontario,[4] R. N. Drummond on the Kaniapiskau and Koksoak rivers in Ungava and H. A. Wood and V. W. Sim along the Hudson Bay Railway in Manitoba,[5] all in 1952. In 1949, Barbara Gutsell and Lera Lake travelled along the Yukon River,[1] and P. Gadbois and I. A. Mackay spent the summer of 1950 in the Mealy Mountains of southern Labrador.[2] W. A. Black carried out economic studies along the Labrador coast in 1950 and 1952.[3]

Office studies pertaining to the Arctic. Various studies involving archival research and photo interpretation have been carried on for some years in the Branch. The Canadian Ice Distribution Survey originally included northern waters only and was later extended to conditions in the Gulf of St. Lawrence and inland waters.[4] The extraction of terrain information from overt published sources is a continuing project in which such information is plotted on the National Topographic Series maps (1:508,660) and cross-indexed on cards. A special project involved the preparation of a series of maps showing relative relief and surface materials for use in the planning of the Distant Early Warning Line.

A booklet on the general geography of the Canadian Arctic was published in 1951.[5] An issue of *Focus,* published by the American Geographical Society in 1952, was based on a manuscript by

---

[1]Gadbois, P. and C. Laverdière. 1954. Esquisse géographique de la région de Floeberg Beach, nord de l'Ile Ellesmere. Geog. Bull. No. 6: 17-44.

[2]Mackay, J. R. 1953. Fissures and mud circles on Cornwallis Island, N.W.T. Can. Geog. No. 3: 31-37.

[3]Sim, V. W. Geographical aspects of weather and climate at Eureka, N.W.T. Geog. Bull. No. 10. In press.

[4]Dean, W. G. 1956. Glacial features of the Hearst-Cochrane map-sheet area. Can. Geog. No. 8: 35-45.

———Human geography of the Albany River Basin. Geog. Bull. No. 10. In press.

[5]Sim, V. W. 1956. The Pas, Manitoba. Geog. Bull. No. 8: 1-21.

[1]Gutsell, Barbara. 1953. Dawson City. Geog. Bull. No. 3: 23-49.

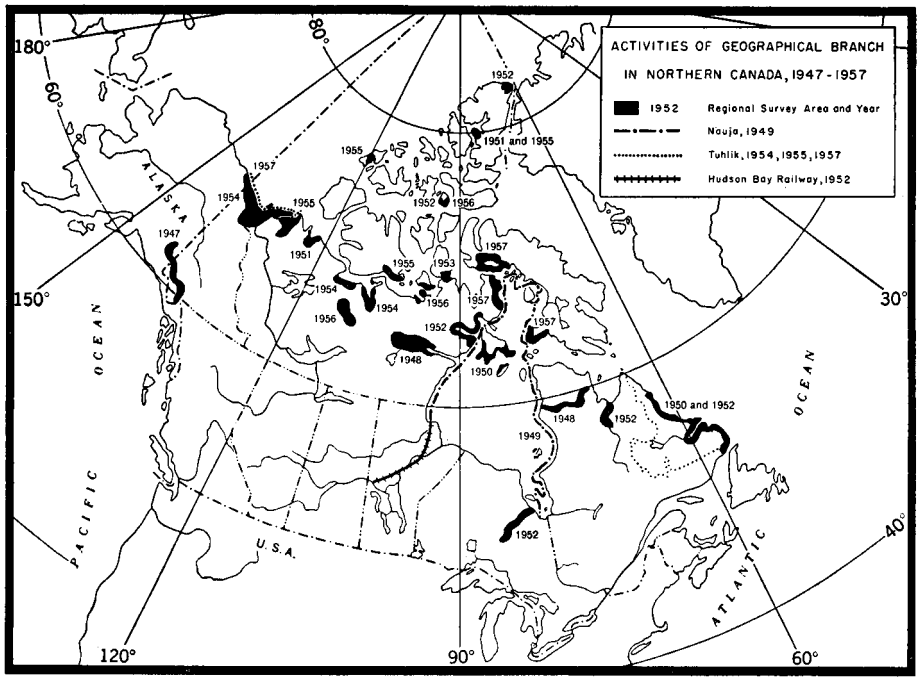
[2]Gadbois, P. and I. A. Mackay. 1954. A vegetation map of the Carter Basin area, Lake Melville lowlands, Newfoundland. Geog. Bull. No. 5: 1-3.

[3]Black, W. A. 1956. Population distribution of the Labrador coast, Newfoundland. Geog. Bull. No. 9: 53-74.

[4]Fraser, J. K. 1952. Canadian ice distribution survey. Arctic Circ. 5: 56. Reprinted in Arctic 5: 195.

Forward, C. N. 1956. Sea ice conditions along the Hudson Bay route. Geog. Bull. No. 8: 22-50.

[5]Robinson, J. L., *et al.* 1951. An introduction to the geography of the Canadian Arctic. Ottawa: Dept. of Mines and Tech. Surv., Geog. Branch, Infor. Series No. 2, xii + 118 pp.



Activities of the Geographical Branch in northern Canada, 1947-57.

N. L. Nicholson,[1] who, in 1953, contributed to a symposium on arctic mapping at the annual meeting of the American Society of Photogrammetry.[2] In 1954, an article on the Hudson Bay lowlands was published in the Geographical Bulletin, part of the research for which was carried out in the employ of the Branch in 1949.[3] Because of the interest in mining possibilities in northern Ungava, a special study based on reports and air photographs was published in 1955.[1] The Branch supported the publication in 1955 of a memoir on the discovery and exploration of the Queen Elizabeth Islands.[2] Studies in progress include those by F. A. Cook on patterned ground in Canada, its geographical distribution and the problems and techniques of studying it, and by J. K. Fraser on freeze-thaw cycles and their relation to mechanical weathering in Canada.

J. KEITH FRASER

[1]Nicholson, N. L. 1952. Resources of the Arctic. Focus (Amer. Geog. Soc.), Vol. 2, No. 6, 5 pp.

[2]———————1955. The contribution of explorers to the mapping of arctic North America. Panel on arctic mapping. Photogramm. Eng. 19: 380-385.

[3]Cooms, D. B. 1954. The physiographic subdivisions of the Hudson Bay lowlands south of 60 degrees north. Geog. Bull. No. 6: 1-16.

[1]Drinnan, R. H. and L. Prior. 1955. Physical characteristics of the Ungava Bay area. Geog. Bull. No. 7: 17-37.

[2]Taylor, A. 1955. Geographical discovery and exploration in the Queen Elizabeth Islands. Ottawa: Dept. of Mines and Tech. Surv., Geog. Branch, Mem. No. 3, 172 pp.