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ON RESEARCH IN THE GEOLOGICAL SCIENCES

CURRENT RESEARCH IN THE GEOLOGICAL
SCIENCES IN CANADA 1966-67

Compiled by
J.F. Henderson

GEOLOGICAL SURVEY OF CANADA PAPER 67-58
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CURRENT RESEARCH IN THE GEOLOGICAL
SCIENCES IN CANADA, JUNE, 1966 - MAY, 1967

INTRODUCTION

The research projects listed in this bibliography have been obtained from the universities, federal and provincial departments of mines, and other non-industrial institutions carrying on research in the geological sciences in Canada. With the exception of a few projects, the bibliography does not include research by mining and oil company geologists. The survey was made between December 1966 and April 1967 and records research in progress for about the period June 1965 to May 1967.

The bibliography is useful in enabling research workers to see who are working in similar fields and on similar problems. It indicates lines of geological research receiving the greatest attention and, by inference, those being neglected. It also serves as a record of the large number of research projects undertaken as graduate theses in our universities, of which the results are available only in manuscript form in university libraries.

Success in assembling project titles for a bibliography such as this depends on the response of institutions and research workers. Acknowledgment is made in particular to those who assembled and forwarded the data on the research projects in the institutions under their direction. However in spite of general excellent cooperation, many projects on which no information was received have not been included. So that succeeding compilations may be more complete, any reader doing research projects or knowing of projects that have been omitted, is requested to send information on them to the Secretary, National Advisory Committee on Research in the Geological Sciences, 601 Booth Street, Ottawa.

Use of the Bibliography

In the bibliography, projects are grouped under main headings that cover the different branches of the geological sciences. The reader can thus find out readily the research in progress in any field in which he is interested. Many projects that seem to fall equally well under more than one heading are repeated under those headings. An author index lists after each author the numbers of projects, as listed in the bibliography, on which he is currently engaged. Thus by reference to the author index, the fields of research and the projects of any worker may be found.

AREAL GEOLOGY

Alberta

1. Akehurst, A.J., Univ. of British Columbia:
Precambrian rocks in the Lake Louise area, Alberta, 1963-67;
Ph.D. thesis.
2. Mountjoy, E.W., McGill Univ.:
Mount Robson southeast map-area 83E SE, 1959-.
Study includes regional study and mapping of structures and
stratigraphy. See Geol. Surv. Can., Prelim. Map 47-1063, 1964.
3. Ollerenshaw, N.C., Geol. Surv. Can.:
Lake Minnewanka, Alberta, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 104.
4. Price, R.A., Aitken, J.D., Geol. Surv. Can., Mountjoy, E.W.,
McGill Univ.:
Operation Bow-Athabasca, Alberta and British Columbia, 2 miles
and 4 miles to the inch, 1965-66.
A reconnaissance study of 12,000 square miles of the Rocky
Mts. south from Jasper, Alberta. See Geol. Surv. Can., Paper
67-1A, 1967, pp. 106-112.

British Columbia

5. Campbell, R.B., Geol. Surv. Can.:
McBride map-area, British Columbia, 1 inch to 4 miles, 1965-66.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 53-55.
6. Carr, J.M., British Columbia Dept. of Mines and Petroleum Resources:
Geology of the Endako area, 1964-66.
See the geology of the Endako area, Minister of Mines and
Petroleum Resources British Columbia, Annual Report, 1965, pp.
114-134.
7. Church, N.B., Univ. of British Columbia:
Geology of the White Lake Basin, British Columbia, 1963-67; Ph.D.
thesis.
8. Coates, J., Geol. Surv. Can. (part time):
Structural studies in the Manning Park and adjacent areas of the
Cascades Mountains, 1964-66.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 56-57.

9. Fyles, J.T., British Columbia Dept. of Mines and Petroleum Resources:
Jordan River area, British Columbia, 1964-67.
Study of structure and lead-zinc mineralization in rocks of the Shuswap metamorphic complex. Part of the Cordilleran Structure Project.
10. Grove, E.W., British Columbia Dept. of Mines and Petroleum Resources:
Structure and mineralization in the Stewart-Unuk River area, British Columbia, 1964-.
Regional mapping with emphasis on structure and mineralization along the eastern margin of the Coast Range Batholith.
11. Hutchison, W.W., Geol. Surv. Can.:
Port Essington and Prince Rupert, British Columbia, 1 inch to 4 miles, 1962-.
See Geol. Surv. Can., Paper 66-1, 1966, pp. 80-85 and Paper 67-1A, 1967, p. 63.
12. Leech, G.B., Geol. Surv. Can.:
Kananaskis Lakes and Canal Flats, 1 inch to 4 miles, 1962-65.
See Geol. Surv. Can., Paper 66-1, 1966, pp. 65-66.
13. McMillan, W.J., Geol. Surv. Can.:
Seymour Arm vicinity, Ratchford Creek map-area, British Columbia, 1 inch to 1 mile, 1965-66.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 75.
14. Muller, J.E., Geol. Surv. Can.:
Pine Pass map-area, British Columbia, 1 inch to 4 miles, 1959-66.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 77-80.
Port McNeill area and Nanaimo Basin, Vancouver Island, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 81-82.
15. Preto, V.A., Geol. Surv. Can.:
Grand Forks, West Half, British Columbia, 1 inch to 1 mile, 1965-66; Ph.D. thesis.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 84-86.
16. Price, R.A., Aitken, J.D., Geol. Surv. Can., Mountjoy, E.W., McGill Univ.:
Operation Bow-Athabasca, Alberta and British Columbia, 2 miles and 4 miles to the inch, 1965-66.
A reconnaissance study of 12,000 square miles of the Rocky Mts. south from Jasper, Alberta. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 106-112.

17. Souther, J.G., Geol. Surv. Can.:
Telegraph Creek, British Columbia, 1 inch to 1 mile, 1965-66.
Study of recent volcanic centres and their relation to regional tectonics. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 89-92.
18. Tipper, H.W., Geol. Surv. Can.:
Taseko Lakes map-area.
See Geol. Surv. Can. Paper 67-1A, 1967, pp. 49-50.
Mesozoic stratigraphy of Skeena River region, British Columbia (Operation Skeena River), 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 93-94.
19. Wheeler, J.O., Geol. Surv. Can.:
Big Bend, British Columbia, 1 inch to 4 miles, 1962-.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 95.

Manitoba

20. Anderson, D.T., Univ. of Manitoba:
Photogeology for Project Pioneer area, Manitoba, 1965-70.
Project Pioneer is joint University of Manitoba-Manitoba Mines Branch geological study of a portion of eastern Manitoba centred on Bissett. The photogeological research is an integral part of this study.
21. Brisbin, W.C., Univ. of Manitoba, and Turek, A.C., Haugh, I., Scoates, R.F.J., Manitoba Mines Branch:
Development of computer treatment methods for field observations and programming for their retrieval, decoding and plotting (Project Pioneer).
22. Rousell, D.H., Manitoba Mines Branch (part time), Laurentian Univ. of Sudbury:
Geology of the Iskawasum Lake area, Manitoba, 1966-67.
23. Weber, W., Manitoba Mines Branch:
Rice Lake-Beresford Lake region, southeastern Manitoba, 1966-71 (Project Pioneer).
Includes study of the petrology, metamorphism, structure of Precambrian gneisses, acid and basic intrusions, volcanics, and sediments and their age-relationships.

Newfoundland and Labrador

24. Church, W.R., Univ. of Western Ontario:
Geology of the Burlington Peninsula and adjoining areas, Northeast Newfoundland, 1963-.
See Structural evolution of northeast Newfoundland; comparison with that of the British Caladonides. Maritime Sediments, vol. 1, 10-14, 1965.
25. Cockburn, G., Univ. of Western Ontario:
Geology of the Confusion Bay area, northeast Newfoundland, 1966-68; thesis project.
26. Neale, E.R.W., Geol. Surv. Can.:
Baie Verte map-area, 1 inch to 1 mile, 1958-66.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 183-186.
27. Stevens, R.K., Geol. Surv. Can.:
Great Northern Peninsula, Newfoundland, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 186-188.
28. Taylor, F.C., Geol. Surv. Can.:
Geological reconnaissance, northern Quebec and Labrador, 1966.
In preparation for 'Operation Torngat' in 1967.
29. Williams, F.M.G., Geol. Surv. Can.:
Snegamook map-area, Labrador, 1966-; Ph.D. thesis.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 195-196.
30. Williams, H., Geol. Surv. Can.:
Red Indian Lake E 1/2 map-area, Newfoundland, 1 inch to 4 miles, 1965-66.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 189-192.

New Brunswick

31. Anderson, F.D., Geol. Surv. Can.:
McKendrick Lake, New Brunswick, 1 inch to 1 mile, 1966-67.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 168-169.
32. Ruitenbergh, A.A., Geol. Surv. Can.:
St. Stephen-Mt. Pleasant area, New Brunswick, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 169-172.

33. van de Poll, H.W., New Brunswick Dept. of Natural Resources:
Geology of the Mount Pleasant area, Charlotte and Sunbury counties,
New Brunswick, 1962-67.
The study was initiated to determine the age of rocks enclosing
the Mount Pleasant tin occurrence, to gain a better understanding
of the origin and mode of emplacement of the acidic volcanic rocks,
distributions of host rock alteration and to delineate areas of eco-
nomic interest and understand the structural control.
34. Williamson, D.H., Laurentian Univ. of Sudbury:
Geology of the metamorphic basement complex of the northeastern
part of Caledonia Mountain, southeastern New Brunswick,
1962-67.
A comprehensive geological study to establish the stratigraphic
sequence and to determine the relationships of the igneous plutons
to the metamorphism.

Northwest Territories

35. Bostock, H.H., Geol. Surv. Can.:
Contwoyto Lake (West Half), Point Lake (East Half), 1 inch to 4
miles, 1964-65.
See Geol. Surv. Can., Paper 66-1, 1966, pp. 25-28.
Wholdaia Lake, Northwest Territories, 1 inch to 4 miles, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 29.
36. Christie, R.L., Norford, B.S., Trettin, H.P., Nassichuk, W.W.,
Geol. Surv. Can.:
Northern Ellesmere Island and Northern Greenland (Operation Grant
Land), 1 inch to 8 miles, 1965-66.
An air-supported reconnaissance of some 40,000 square miles.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 2-3.
37. Dineley, D.L., Mercer, I.D., Univ. of Ottawa:
Geology of the Boothia Arch, Northwest Territories, 1964-68.
See Notes on the scientific results of the University of Ottawa
expedition to Somerset Island 1965; Arctic, 19, 1966.
38. Fraser, J.A., Geol. Surv. Can.:
Rocknest Lake, Mackenzie district, 1 inch to 4 miles, 1964-65.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 34.

39. Gabrielse, H., Blusson, S.L., Handfield, R.C., Uptis, U., Geol. Surv. Can.:
Operations Selwyn-Wrigley and Watson Lakes, Jennings River, Sekwi Mountains, Nahanni, and Frances Lake, Northwest Territories, Yukon and British Columbia, 1 inch to 4 miles, 1965-66.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 44-45 and 47-48.
40. Heywood, W.W., Davidson, A., Geol. Surv. Can.:
Study of sedimentary and volcanic rocks of Ennadai-Rankin belt; Northwest Territories, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 19-22.
41. Reinhardt, E.W., Geol. Surv. Can.:
Geological investigations south of the McDonald fault, Great Slave Lake, Northwest Territories, 1965-66.
A regional study of gneisses and mylonites between the fault and the Nonacho basin. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 40-43.

Nova Scotia

42. Benson, D.G., Geol. Surv. Can.:
Merigomish, Nova Scotia, 1 inch to 1 mile, 1964-65.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 173.
Stratigraphy of Antigonish Basin, Nova Scotia, 1966-.
43. Kelley, D.G., Geol. Surv. Can.:
Cobequid Mountains, 1 inch to 1 mile, 1961-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 175-176.

Ontario

44. Appleyard, E.C., Univ. of Waterloo:
Mineralogy, petrology and geochemistry of nepheline gneisses of the Wolfe Belt, Lyndock township, Ontario, 1958-68.
See Nepheline gneisses of the Wolfe Belt, Lyndock township, Ontario, Pt. I. Canada Jour. Earth Sc., in press.
Geology of the area round Dønnesfjord, Sørøy, north Norway, with emphasis on metasomatic phenomena, 1963-68.
See A preliminary description of the geology of the Dønnesfjord area, Sørøy. Norges Geologiske Undersøkelse, nr. 231, 1965, p. 143.

45. Bennett, G., Brown, D.D., George, P.T., Ontario Dept. of Mines:
Operation Kapuskasing, District of Cochrane, 1 inch to 2 miles,
1966-67.
The area mapped includes about 28,000 square miles in north-
eastern Ontario. See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp.
42-47.
46. Bright, E.G., Ontario Dept. of Mines:
Halliday and Midlothian townships, Districts of Timiskaming and
Sudbury, 1 inch to 1/2 mile, 1966-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 51-54.
47. Card, K.D., Ontario Dept. of Mines:
Espanola-Whitefish Falls area, District of Sudbury, 1 inch to 1/2
mile, 1967-68.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 33-35.
48. Carmichael, D.M., Geol. Surv. Can.:
Structural studies, Hastings area, Ontario, 1 inch to 1 mile, 1965-
66; Ph.D. thesis.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 133-134.
49. Coates, M.E., Ontario Dept. of Mines:
Killala-Vein Lakes area, District of Thunder Bay, 1 inch to 1 mile,
1966-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 23-25.
50. Davies, J.C., Ontario Dept. of Mines:
Atikwa Lake area, District of Kenora, 1 inch to 1/2 mile, 1966-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 12-13.
51. Fenwick, K.G., Ontario Dept. of Mines:
Fredart-Whitemud Lakes area, District of Kenora, 1 inch to 1/2
mile, 1964-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 3-4.
52. Frarey, M.J., Geol. Surv. Can.:
Lake Panache, Ontario, 1 inch to 1 mile, 1964-66.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 135-137.
53. Giblin, P.E., Ontario Dept. of Mines:
Kincaid township, Batchewana area, District of Algoma, 1 inch to
1/2 mile, 1966.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 28-29.

54. Harris, F.R., Ontario Dept. of Mines:
Moss Lake area, District of Thunder Bay, 1 inch to 1/2 mile,
1966-68.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 13-14.
55. Hewitt, D.F., Ontario Dept. of Mines:
Madoc area, county of Hastings, 1 inch to 1/2 mile, 1966.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 56-57.
56. Janes, J.R., Univ. of Toronto:
Symbolic treatment of field and analytical data as applied to geologic
mapping, 1966-67; M.E. thesis.
57. Johnston, F.J., Ontario Dept. of Mines:
Vermilion-Abram Lakes area, District of Kenora, 1 inch to 1/2 mile,
1964-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 7-10.
58. Kaye, L., Ontario Dept. of Mines:
Eayrs-Starnes Lakes area, District of Thunder Bay, 1 inch to 1
mile, 1964-66.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 16-18.
Tib-Jack Lakes area, District of Thunder Bay, 1 inch to 1 mile,
1966-67.
59. Kustra, C.R., Ontario Dept. of Mines:
Obonga-Leigh Lakes area, District of Thunder Bay, 1 inch to 1/2
mile, 1966-68.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 18-20.
60. Leahy, E.J., Ontario Dept. of Mines:
Nighthawk Lake area, District of Cochrane, 1 inch to 1/2 mile,
1963-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 41-42.
Hearst-Kapuskasing Portion of Operation Kapuskasing, District of
Cochrane, 1 inch to 1 mile, 1966-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 48-49.
61. Lovell, H.L., Ontario Dept. of Mines:
Terry, Lee and Maisonville townships, District of Timiskaming, 1
inch to 1/2 mile, 1966-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 49-51.
62. McIlwaine, W.H., Ontario Dept. of Mines:
Nicol township, Gowganda area, District of Timiskaming, 1 inch to
1/2 mile, 1966-68.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 54-55.

63. Meyn, H.D., Ontario Dept. of Mines:
Hutton and Parkin Townships, District of Sudbury, 1 inch to 1/2 mile, 1964-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 35-37.
64. Milne, V.G., Ontario Dept. of Mines:
Reeves-Kenogaming area, District of Sudbury, 1 inch to 1/2 mile, 1966-68.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 38-41.
65. Riley, R.A., Ontario Dept. of Mines:
Glasgow-Rennie area, Districts of Algoma and Sudbury, 1 inch to 1/2 mile, 1966-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 25-28.
66. Robertson, J.A., Ontario Dept. of Mines:
Spanish-Massey area, Districts of Algoma and Sudbury, 1 inch to 1/2 mile, 1967-68.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 30-33.
67. Shklanka, R., Ontario Dept. of Mines:
Bruce Lake area, District of Kenora (Patricia Portion), 1 inch to 1/2 mile, 1966-67.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 5-7.
68. Skinner, R., Geol. Surv. Can.:
Sioux Lookout map-area, 1 inch to 4 miles, 1964-67.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 162-163.
69. Wilson, H.D.B., Brisbin, W.C., Hall, D.H., Hajnal, Z., McGrath, P., Univ. of Manitoba:
Nature of the Canadian Shield in Manitoba and northwestern Ontario, 1960-; Ph.D. thesis (McGrath).
A joint project, regional geology and gravity, Wilson and Brisbin; magnetic, Hall and McGrath; seismic, Hall and Hajnal and Brisbin; age dating, G.S. Clark.
70. Wynne-Edwards, H.R., Queen's Univ.:
The tectonics of the Grenville province, Ontario and Quebec, 1960-.
A continuing examination of the Grenville province and the tectonic and age relations among the different rocks within it. This is a composite study based on several smaller projects within the Grenville Province, as reported elsewhere. See The Grenville Province and its tectonic significance - Reply to Discussion; Proc. Geol. Assoc. Canada, 16, pp. 59-62.

Quebec

71. Allard, G.O., Quebec Dept. of Natural Resources (part time), Univ. of Georgia:
Northwest quarter of Rinfret township, Abitibi-East county, Quebec; 1,000 feet to 1 inch, 1966-68.
Includes study of the well layered and differentiated gabbroic sill known as the Doré Lake Complex.
72. Bogoch, R., Quebec Dept. of Natural Resources (part time), McGill Univ.:
South half of Perron township, Abitibi-West county; 1,000 feet to 1 inch, 1966; M.Sc. thesis.
73. Chown, E.H., Quebec Dept. of Natural Resources (part time), Loyola College:
Lac Pletipi area, 1963-66.
Geology of the Otish Mountains, Quebec, 1963-68.
See East Péribonca River area, Quebec; Dept. Nat. Res., Prelim. Rept. 535, 1965.
74. Davies, R., McGill Univ.:
Mutton Bay and surrounding rocks, Saguenay co., 1963-67; Ph.D. thesis.
75. de Römer, H., Quebec Dept. of Natural Resources:
Lake Madeleine area, Lesseps and Deville townships Gaspé-North county; 1,000 feet to 1 inch, 1963-.
The continuation of a program of detailed mapping in the central part of the Gaspé Peninsula where an Ordovician-Devonian assemblage of rocks surrounding the Table Top Mountains carries base metal mineralization.
76. Dimroth, E., Quebec Dept. of Natural Resources:
Lac Chakonipau area, 1963-67.
Geological study of an area in the Labrador Trough with special emphasis on structure.
77. Duquette, G., Quebec Dept. of Natural Resources:
Compilation and mapping of the geology in the Chibougamau district; 1,000 feet to 1 inch.
A continuing program of investigation including compilation of maps using the information offered by the mining companies and personal observations in the field.

78. Duquette, G., Mathieu, A., Quebec Dept. of Natural Resources:
Southwest quarter of Obalski township, Abitibi-East county; 1,000 feet to 1 inch, 1966-67.
Part of a program of mapping in detail an economically important section of the Chibougamau greenstone belt.
79. Globensky, Y., Quebec Dept. of Natural Resources:
Geology of the Drummondville area, 1965-67.
Semi-detailed mapping with special emphasis on the structure.
80. Hardy, R., Quebec Dept. of Natural Resources (part time), Univ. of Montreal:
Payne Bay area, New-Quebec, 1966-67.
81. Jacoby, R.S., Quebec Dept. of Natural Resources (part time), Queen's Univ.:
Reservoir Baskatong area, 1965-67.
82. Kish, L., Quebec Dept. of Natural Resources:
West Half of Blondeau township, Timiscamingue area; 1,000 feet to 1 inch, 1964-67.
The area is in the vicinity of the nickel-copper deposit being exploited by Lorraine Mining Co. Ltd.
Lake Otelnuk area, New-Quebec, 1965-66.
Detailed study of geochemically anomalous areas in the Labrador Trough detected in 1964 in the course of routine sampling of stream sediments.
83. Lajoie, J., Quebec Dept. of Natural Resources (part time), Univ. of Montreal:
Trois-Pistoles area, 1965-67.
Special study of the sedimentary rocks of the Quebec complex of Cambro-Ordovician age of the Appalachians.
84. Latulippe, M., Quebec Dept. of Natural Resources:
Compilation and mapping of the geology in the Val d'Or district, Quebec; 1,000 feet to 1 inch.
A continuing program of investigation including compilation of maps using the information offered by the mining companies and personal observations in the field.
85. Laurin, A.F., Quebec Dept. of Natural Resources:
The Péribonca River area, 1966-67.
Reconnaissance mapping to give general knowledge of the Grenville Province and its economic possibilities.

86. MacIntosh, J.A., Quebec Dept. of Natural Resources:
Southeast quarter of Nelligan township, Abitibi-East county; 1,000 feet to 1 inch, 1966-.
Detailed mapping in an area of volcanic rocks susceptible of economic mineralization.
87. Mills, P.J., Quebec Dept. of Natural Resources (part time), Univ. of Kansas:
Lac Alder area, 1965-67.
88. Murtaugh, J.G., Quebec Dept. of Natural Resources (part time), Univ. of Ohio:
Lac Manicouagan area, 1964-67.
Part of a continuing joint project with Quebec Department of Natural Resources and the Geological Survey of Canada to determine the nature and origin of the structure bounded by the Manicouagan and Mouchalagan Lakes which may be a volcano-tectonic feature or the result of meteorite impact.
89. Osborne, F.F., Université Laval:
Geology near Quebec City, 1950-68.
See Post Lévis beds of the Quebec Group at St. Appollinaire, Lotbinière, Co. P.Q.; Nat. Can. vol. 93, pp. 145-151, 1966.
90. Pyke, D.R., McGill Univ.:
The Montauban area, Quebec, 1963-67; Ph.D. thesis.
91. Rondot, J., Quebec Dept. of Natural Resources:
Malbaie River area, Quebec, 1964-67.
Includes special studies of shatter cones, charnockites and late glacial deposits. See Preliminary Report on Anse St. Jean area, Quebec Dept. of Natural Resources, 1965.
92. Sabourin, R., Université Laval:
Geology of the Bourbonnais-Mitchel area, 1962-67.
See Bourbonnais-Limousin area, Pontiac county, Quebec; Dept. Nat. Res., Prelim. Rept. 509, 1963.
93. Sharpe, J.I., Quebec Dept. of Natural Resources:
Compilation and mapping of the geology in the Rouyn-Noranda district; 1,000 feet to 1 inch.
A continuing program of investigation including compilation of maps using information offered by the mining companies and personal observations in the field.
94. St. Julien, P., Quebec Dept. of Natural Resources:
Geology of the Quebec area, 1966-67.

95. Stevenson, I.M., Geol. Surv. Can.:
Northwest River map-area, Labrador and Quebec, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 193-195.
96. Underhill, D.H., McGill Univ.:
The Romanet Lake-Dumphy Lake area, east side Labrador Trough,
Quebec, 1966-67; M.Sc. thesis.
97. Wolhuter, L.E., Quebec Dept. of Natural Resources (part time),
McGill Univ.:
Opemiska area, Abitibi-East county, 1966; Ph.D. thesis.
Revision of formations and structures prior to production of a
final report.
98. Wynne-Edwards, H.R., Queen's Univ.:
The tectonics of the Grenville Province, Ontario and Quebec, 1960-.
A continuing examination of the Grenville Province and the
tectonic and age relations among the different rocks within it. This
is a composite study based on several smaller projects within the
Grenville Province, as reported elsewhere. See The Grenville
Province and its tectonic significance - Reply to Discussion; Proc.
Geol. Assoc. Canada, 16, pp. 59-62.

Saskatchewan

99. Chadwick, B., Saskatchewan Dept. of Mineral Resources:
Morell Lake area (West Half); 1 inch to 1 mile, 1966.
See Summary Report of Geological Surveys in the Precambrian
area of Saskatchewan, 1966.
100. Forsythe, L.H., Saskatchewan Dept. of Mineral Resources:
Geology of the MacKay-Sulphide Lakes area, 1 inch to 1/2 mile,
1964-67.
A detailed study to determine the geology and structure in this
key area, where a number of gold occurrences are known. See
Summary of Field Work in Precambrian of Saskatchewan, 1966.
101. Johnson, R.L., Saskatchewan Dept. of Mineral Resources:
Hanson Lake area (West Half); 1 inch to 1 mile, 1966.
Area lies near gradational contact of Kisseynew gneisses with
Amisk and Missi rocks. See Summary Report of Geological Surveys
in the Precambrian area of Saskatchewan, 1966.

102. Johnston, W.G.Q., Saskatchewan Dept. of Mineral Resources:
Waddy Lake area (East Half); 1 inch to 1 mile, 1966.
See Summary Report of Geological Surveys in the Precambrian
area of Saskatchewan, 1966.
103. Koster, F., Saskatchewan Dept. of Mineral Resources:
Zin Bay area (West Half); 1 inch to 1 mile, 1966.
See Summary Report of Geological Surveys in the Precambrian
area of Saskatchewan, 1966.
104. Money, P.L., Univ. of Alberta:
Precambrian geology of the Needle Falls area, Saskatchewan,
1961-67; Ph.D. thesis.
105. Padgham, W.A., Saskatchewan Dept. of Mineral Resources:
Deschambault Lake district; 1 inch to 1 mile, 1963-67.
See Summary Report of Geological Surveys in the Precambrian
area of Saskatchewan, 1964-66.

Yukon Territory

106. Gabrielse, H., Blusson, S.L., Handfield, R.C., Uptis, U., Geol.
Surv. Can.:
Operation Selwyn - Wrigley and Watson Lakes, Jennings River,
Sekwi Mountains, Nahanni, and Frances Lake, Northwest
Territories, Yukon and British Columbia, 1 inch to 4 miles,
1965-66.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 44-45 and
47-48.

ENGINEERING GEOLOGY

107. Bozozuk, M., Burn, K.N., Crawford, C.B., Eden, W.J., Jarrett,
P.M., Division of Building Research, National Research
Council:
Geotechnical properties of eastern marine clay, 1951-.
Both field and laboratory studies are being conducted on the
"Champlain Sea" clay of the St. Lawrence Lowlands. Field studies
are concerned with the investigation of several landslide occur-
rences, the observation of settlements due to highway embankments
and the effect of volume changes due to seasonal moisture changes.
Currently attempts are being made to measure the build-up of
loads due to negative skin on long piles in a subsiding clay layer.

Laboratory investigations are being continued on the stress deformation characteristics of the clay. See Anevaluation of the field Vane Test in sensitive clay; A.S.T.M., Spec. Tech. Pub. No. 399, pp. 8-17, 1966.

108. Brown, R.J.E., Division of Building Research, National Research Council:

Permafrost distribution in Canada, 1953-.

Observations on the occurrence of permafrost throughout the permafrost region of Canada, with emphasis on the southern fringe area, are being collected continuously by direct field observations, review of the technical literature, report from other individuals and agencies, and questionnaire; this information is recorded on punch cards and plotted on the 8 mile:1 inch maps of Canada. Accompanying this collection of information is the study of the climatic and terrain factors comprising the permafrost environment as a means of improving the understanding of and ability to predict the distribution and occurrence of permafrost. See Relation between mean annual air and ground temperatures in the permafrost region of Canada; Proceedings Permafrost International Conference, Perdue University, 1966, pp. 241-247 (NRC 9272).

109. Chagnon, J.Y., Quebec Dept. of Natural Resources:
Clays and ground slides, 1965-.

A continuing program of research on clays and ground slides including study of areas where sliding has occurred and collection of clay samples for a determination of their physical properties.

110. Coates, D.F., Gyenge, M., Waranica, K., Casey, F.L., Mines Branch, Dept. of Energy, Mines and Resources:
Rock slope stability, 1960-.

A number of projects are being conducted to determine the mechanics of failure in rock slopes. Basic studies are being pursued into the stress distribution occurring in typical slope geometries. Mathematical and photoelastic techniques are being used for this work.

111. Cochrane, T.S., Parsons, R.C., Mines Branch, Dept. of Energy, Mines and Resources:
Rock burst research, 1962-.

Measurements of stress and deformation were conducted in one mine experiencing rock bursts at the shallow depth of 400 ft. The analysis of these data is continuing.

112. Elson, J.A., Yong, R., Frenkel, O.J., Douglas, G., McGill Univ.:
The effect of chemical additives on the permeability of clay soils to water, 1960-; M.Sc. theses (Frenkel and Douglas).

Measurements of the threshold and critical gradients for the movement of water through kaolinite and attapulgite have been made in a permeameter that enables control of the particle spacing and orientation. Pressure gradients from -0.1 to 9 atmospheres have been applied to salt solutions ranging from 0.1 normal to 1.0 normal, and these data are being applied to learn the cause of the deviations from the diffusive flow predicted by Kemper. Future work will include the measurement of electro-kinetic potentials to enable the separation of the relative effects of diffusive flow from those of viscous flow especially near threshold gradients. This study has many applications to geology, including the salt-sieving effect, movement of oil field fluids, infiltration of surface water to the groundwater reservoir, and the behaviour of soils during wetting and drying.

113. Fetulah, A., Univ. of Manitoba:
Effect of freezing on the physical properties of Agassiz clay with special reference to hydro tower anchor pullouts; M.Sc. thesis.
114. Grant, F., Barron, K., Coates, D.F., van Heerden, W.L., Mines Branch, Dept. of Energy, Mines and Resources:
Measurements of stress in situ, 1951-.
Field measurements of stress in rock has been conducted using both a borehole deformation meter and a strain cell (developed by the U.S. Bureau of Mines and the South African CSIR respectively). Results have been obtained in two different mines. Comparative measurements have been obtained for the two different techniques with encouraging agreement although not with identical results. See Stress Measurements at Elliot Lake, CIM Bull. vol. 59, No. 649, 1966 (May).
115. Grice, R.H., McGill Univ.:
Engineering geology of Montreal Subway, 1965-.
Collection and storage of geological and construction data in a computer store. Development of retrieval system with selective outputs to provide usable information for rock mechanics analysis and future construction and design. Field data supplemented by laboratory tests on absorption and adsorption, unconfined compressive strength and deformation measurements. See Engineering Geology of the Montreal Subway; Engineering Geology (in press).
116. Hamilton, J.J., Gardiner, R.T., Division of Building Research, National Research Council:
Western Canada soil studies, 1960-.
Long term studies of environmental influences on ground movements are being continued at open-field test sites on deep clay

deposits and at buildings on shallow foundations. Field calibration* of nuclear moisture and density probes in three major glacial lake deposits in Western Canada has been initiated. Methods of mapping and testing soils for sulphate hazard to concrete are being studied. Studies of performance of concrete of varying age, composition and conditions of exposure to soils of high sulphate content are underway. See Soil moisture depletion calculations for Winnipeg 1950-1963; NRC 9146, July, 1966.

117. Imantz, D., Univ. of Manitoba:
A study of the optimum lime and moisture content for the stabilization of Agassiz clay subgrades; M.Sc. thesis.
118. Imrie, A.S., Charlesworth, H.A.K., Univ. of Alberta:
Analysis of underground powerhouse and at the Portage Mountain damsite, Hudson Hope, British Columbia, 1965-67; M.Sc. thesis (Imrie).
119. Johnston, G.H., Division of Building Research, National Research Council:
Kelsey Generating Station - dyke studies.
The performance of dykes constructed on permafrost in the southern fringe area of the permafrost region in northern Manitoba is being studied by means of ground temperature and dyke movement observations. See Permafrost studies at the Kelsey Hydro-Electric Generating Station - Research and Instrumentation, Division of Building Research Technical Paper 178 (NRC 7943) March, 1965.
Observations at Inuvik, Northwest Territories, 1954-.
The evaluation of the performance of various engineering facilities, e.g. building foundations, airstrip, roads, utilidors, etc. constructed on permafrost were continued by means of ground temperature and pile movement surveys. Depth of thaw surveys at sites having different soil and surface cover conditions in undisturbed areas and under buildings were carried out. See Pile Construction in Permafrost - published in Proc. of International Conference on Permafrost - U.S. Nat. Acad. of Sciences, National Research Council Publication #1287, July 1966. (DBR/NRC #9269)
120. Johnston, G.H., Blackwell, J.M., Division of Building Research
National Research Council:
Anchorage in permafrost, 1965-.
Terrain evaluations and subsurface investigations were carried out at Thompson and Gillam, Manitoba in connection with the problem of providing adequate anchorage in permafrost for guyed power transmission line towers. Several types of anchors installed in

permafrost were tested and equipment was developed and planning begun for more extensive field tests in 1967.

Permafrost at Thompson, Manitoba, 1961-.

Reconnaissance surveys including drilling and probing and terrain evaluations were carried out in the vicinity of Thompson to select areas for detailed terrain and engineering studies to be initiated in 1967. Observations of permafrost occurrence and the ground thermal regime were continued in the townsite by means of visual examinations of conditions in excavations, examinations of borehole logs and measurement of ground temperatures.

121. Laroque, G.E., Terada, M., Darling, J.A., Aslam, M., Coates, D.F., Mines Branch, Dept. of Energy, Mines and Resources: Shock wave propagation, 1963-.

A research project is in process for studying the coupling of explosive energy with rock and the propagation of the resultant shock into the rock both for surface explosions and underground explosions. A laboratory project has been completed on measuring particle velocities and propagation velocities within the crater zone from a surface explosion. This laboratory work has been conducted using two different types of explosive and three different types of hard rock. A second set of field experiments have been conducted on ground motion acceleration close to a chemical explosion. See Attenuation of the Spherical Stress Wave Induced in Elliot Lake Quartzite by an Explosion, FMP 66/108-MRL.

122. Ledoux, R.L., Université Laval: Mineralogical studies of quick clays in the Province of Quebec, 1965-68.

Includes mineralogical, mechanical and physico-chemical studies of the quick clays.

123. MacFarlane, I.C., Division of Building Research, National Research Council: Muskeg Research, 1954-.

Current project is field studies of consolidation response of peat, carried out in conjunction with laboratory test program. Investigations also underway into tensile strength of peat.

124. Neilson, J.M., Queen's Univ.: Textbook - Elements of Engineering Geology - Harper and Row, 1963-67.

125. Owen, E.B., Geol. Surv. Can.: Engineering geology investigations of dam sites in the Yukon and Northwest Territories, 1959-.

See Geol. Surv. Can., Paper 67-1A, 1967, pp. 49-50.
Engineering geology investigations, Welland Canal area.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 158.

126. Parsons, R.C., Coates, D.F., Hardy, H.R. Jr., Hedley, D.G.F.,
Mines Branch, Dept. of Energy, Mines and Resources:
Time-dependent deformation of geologic materials, 1962-.
Tests have been conducted in the laboratory on a wide spectrum
of rock substances to determine typical time-dependent deformation
properties. In addition, a special study is being conducted on
potash. See Experimental Criteria for Classification of Rock
Substances, Int. J. of Rock Mech. and Min. Sci., vol. 3, pp. 181-
189, 1966.
127. Penner, E., Division of Building Research, National Research Council:
Ground temperatures and frost action, 1948-.
See Performance of city pavement structures containing foamed
plastic insulation; Highway Res. Record No. 128, pp. 1-17,
Highway Research Board, 1966.
128. Russell, G.A., Univ. of Manitoba:
An investigation of the effects of varying lime and moisture content
on the stabilization of Agassiz clays, by differential thermal
analysis.
129. Rutter, N., Geol. Surv. Can.:
Surficial geology of Peace River Dam and Reservoir areas,
British Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 87-89.
130. Scott, J.S., Geol. Surv. Can.:
Slope stability, Saskatchewan, Alberta and Manitoba, 1962-66.
Study of geological and hydrogeological factors affecting the
stability of slopes. See Geol. Surv. Can., Paper 67-1A, p. 124.

GEOCHEMISTRY

131. Abbey, S., Geol. Surv. Can.:
Atomic absorption spectroscopy, 1965-.
See Geol. Surv. Can., Paper 66-2, 1966, p. 35.
132. Ahmed, S.M., Mines Branch, Dept. of Energy, Mines and Resources:
Studies of the double layer at sulphide surfaces by the potentio-
metric method, 1966-68.

The objective is to determine the zero point of charge, charge densities, differential capacities and interfacial tensions of sulphide minerals.

Studies of interfacial energies at mineral oxide and sulphide surfaces by contact angle measurements, 1966-68.

The objective is to correlate the information obtained from double layer studies of mineral oxides and sulphides with wettability and floatability through contact angle measurements.

Investigation of hydrogen adsorption of surfaces of titania and cassiterite, 1965-67.

The objective is to study the mechanism of adsorption of hydrogen and hydroxyl ions on titania and cassiterite.

133. Anderson, G.M., Univ. of Toronto:
Mineral solubilities at high temperature and pressures, 1966-68.
See The solubility of quartz in supercritical water; Amer. Jour. Sci., vol. 263, pp. 494-511, 1965.
134. Anderson, P.A.M., McMaster Univ.:
Phase relationships of the hydroxyfeldspathoids in systems lying in the plane $\text{NaAlSiO}_4 - \text{NaOH} - \text{H}_2\text{O}$ at 15,000 psi water pressure, 1963-67; Ph.D. thesis.
135. Baadsgaard, H., Univ. of Alberta:
Thermally induced daughter element migration in igneous rocks, 1965-67.
136. Bailes, A.H., Univ. of Manitoba:
Geology and geochemistry of the Gold Lake property, Rice Lake Area, Manitoba, 1966-67; M.Sc. thesis.
137. Beaton, W.D., McGill Univ.:
Trace element partition in sulphides, 1965-67; Ph.D. thesis.
138. Billings, G.K., Univ. of Calgary:
Trace element cycling in terrestrial biologic systems.
139. Billings, G.K., Bricker, O.P., Mackenzie, F.M., Garrels, R.M., Univ. of Calgary:
Major element variations in sea-water.
140. Billings, G.K., Freeze, R.A., Univ. of Calgary:
Hydrogeochemical balances within groundwater drainage basins, Good Spirits Lake, Saskatchewan.
141. Billings, G.K., Hitchon, B., Univ. of Calgary:
Trace element composition of subsurface brines.

142. Billings, G.K., Leask, D., Univ. of Calgary:
Composition of Precambrian shales; M.Sc. thesis (Leask).
143. Billings, G.K., Ragland, P.C., Wheeler, W., Univ. of Calgary:
Factors affecting the composition of carbonate skeletal material.
144. Billings, G.K., Williams, H.H., Univ. of Calgary:
Exchangeable ions in shales; M.Sc. thesis (Williams).
145. Blais, R.A., Machairas, G., Ecole Polytechnique, Université de Montréal:
Volcanogenic environment of zinc-copper orebodies in the Noranda area, 1964-.
Includes a detailed investigation of Lake Dufault Mine and geochemical investigations on the volcanics of the Noranda area.
146. Bower, F.E., McMaster Univ.:
Oxygen isotope variations in natural sulphates, 1965-67; M.Sc. thesis.
Development of experimental techniques of extracting oxygen from natural sulphates for mass spectrographic analysis. The process involves high temperature reaction of sulphates with graphite to remove oxygen as CO_2 and CO , which is subsequently all converted to CO_2 by a catalytic process before being subject to isotopic analysis. Results of this research are expected to indicate whether it is possible to use oxygen isotopic composition of natural sulphates as indicators of the change in oxygen isotopic composition of the oceans throughout geologic time.
147. Boyle, R.W., Laverne, P.J., Mihailov, G., Durham, C.C., Geol. Surv. Can.:
Appraisal of geochemical methods as a means of locating silver deposits, Cobalt, Ontario, 1966.
See Geol. Surv. Can., Papers 66-46, 1966 and 67-1A, 1967, pp. 132-133.
148. Bright, N.F.H., Lake, R.H.S., and Bowman, W.S., Mines Branch, Dept. of Energy, Mines and Resources:
The reactivity of iron oxides in the formation of ferrites, 1966.
Methods such as differential thermal analysis, thermogravimetric analysis, semi-quantitative X-ray diffraction, etc., of assessing the reactivity of various grades of iron oxides (principally hematite), both natural and synthetic, in the formation of barium and other hexaferrites, to yield technologically important magnetic ceramic materials, are under investigation.

149. Brooker, E.J., Univ. of Toronto:
X-ray fluorescence analysis of rocks and minerals for major and minor constituents, 1965-.
See X-ray spectrographic analysis of minute mineral samples; Can. Mineralogist, vol. 8, pt. 4, 1966.
150. Burley, B.J., McMaster Univ.:
Construction of internally heated high-pressure reactor. Study of the phase equilibria of the system nepheline-calcite.
151. Burwash, R.A., Univ. of Alberta:
Average crustal composition of western Churchill Province, 1965-68.
X-ray fluorescence analyses are being made of approximately 200 samples of Precambrian cores from the Western Canadian Sedimentary Basin.
152. Cabri, L.J., Mines Branch, Dept. of Energy, Mines and Resources:
Sulphide synthesis, 1964-.
Sulphide minerals of closely controlled compositions are synthesized to provide material for other investigations, and to provide fundamental data on phase equilibrium relationships in certain sulphide systems. A series of low-iron sphalerites were successfully synthesized for other investigations and at present high-iron sphalerites are being synthesized.
Phase equilibrium studies in the Cu-Fe-S and related systems, 1965-.
To closely determine equilibrium relations, stability fields and conditions for metastable relations in sulphide systems, and thereby further our knowledge of sulphide ore deposits.
153. Cameron, E.M., Geol. Surv. Can.:
Geochemistry of sediments, 1963-.
Geochemistry of reef and off-reef sediments and in particular to determine trends useful to petroleum industry in exploration for reef structures. See Geol. Surv. Can., Paper 66-1, 1966, p. 186.
Sampling precision in regional geochemical studies, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 2.
154. Church, W.R., Univ. of Western Ontario:
Geochemistry of eclogites, 1961-.
See Eclogites, in Hess, H.H., ed., Basalts. Wiley and Sons, New York (in press).

155. Chyi, L.L., McMaster Univ.:
Precious metal geochemistry of ultra-basic rocks from Mt. Albert, Quebec, 1966-68; M.Sc. thesis.
Neutron activation analysis for gold, palladium, iridium, osmium and ruthenium in olivine, enstatite, clinopyroxene, chromite and serpentinized samples from Mt. Albert, Quebec. The data will be used to determine the fractionation trends of precious metals during crystallization of an ultrabasic rock.
156. Clark, G.S., Univ. of Manitoba:
Rb-strontium isotopic investigation of alkaline intrusions in the Superior Province of the Canadian Shield.
Field and laboratory work is awaiting completion of a mass spectrometer for the isotope studies. The mass spectrometer will be a 10-inch radius, 90 degree sector magnet, solid-source instrument.
157. Coats, A.W., N.R.C. Post-doctorate Fellow and Bright, N.F.H., Mines Branch, Dept. of Energy, Mines and Resources:
The thermal decomposition of pyrite, 1964-66.
The decomposition of pyrite to give pyrrhotite and sulphur vapour was studied in a dynamic argon atmosphere. The nucleation process proved unamenable to study but the kinetics of the gross mass rate of decomposition was investigated over a convenient temperature range and the appropriate activation energies determined by these independent techniques. See The Thermal Decomposition of Pyrite, Can. J. Chemistry vol. 44, No. 10, 1191-1195, 1966.
158. Courville, S., Lachance, G.R., Geol. Surv. Can.:
Rock analysis by X-ray spectrometry.
See Geol. Surv. Can., Paper 66-2, 1966, p. 46.
159. Crocket, J.H., McMaster Univ.:
Neutron activation analysis of precious metals in silicates and sulphides, 1966-67.
Neutron activation analysis of Gl, W1 and Cu, Ni sulphide standard for Au, Os, Ru, Ir, Pt, Pd is being carried out in an attempt to develop a method capable of analysis of these elements in silicates and sulphides.
160. Doig, R., McGill Univ.:
Isotope geology, 1964-.
K/Ar and Rb/Sr isotopic studies of Chatham-Grenville type rocks, Monteregion rocks, and anorthosites. K/Rb ratio studies of rocks of the anorthosite-mangerite series.

161. Dyck, W., Geol. Surv. Can.:
Rates of diffusion of trace elements in solutions and solids,
1966-71.
162. Edgar, A.D., Mottana, A., Univ. of Western Ontario:
Geochemistry of eclogites, 1966-70.
Involves investigations of certain actual reactions pertinent to
eclogites under conditions of high temperature and pressure;
melting relationships in eclogites and associated rocks; crystallog-
raphy of omphacites.
163. Edgar, A.D., Piotrowski, J.M., Sood, M.K., Univ. of Western
Ontario:
Melting relations in alkaline rocks, 1964-68; Ph.D. thesis
(Piotrowski), M.Sc. thesis (Sood).
Melting studies and sequences of crystallization of selected
alkaline rocks at pressures up to 2 kilobars P_{H_2O} ; correlation of
melting sequences with observed paragenesis and with the chem-
istry of the rocks has been made. See Melting relations in
alkaline rocks, Paper presented to annual M.A.C. meeting,
Halifax, 1966.
164. Fawcett, J.J., Univ. of Toronto:
Chemical reactions involved in low grade metamorphic rocks,
1964-.
See The phase relations of chlorites in the system $MgO-Al_2O_3-SiO_2-H_2O$; American Mineralogist, Mar-Apr. 1966.
165. Faye, G.H., Mines Branch, Dept. of Energy, Mines and Resources:
Chemical reaction at surfaces of base metal sulphide minerals,
1964-.
Currently the reaction of chelating agents such as 2 - 2
biquinoline and substituted phenanthrolines with the iron and copper
in chalcopyrite, and substituted phenanthrolines with iron in iron
bearing zinc sulphides, is being investigated.
166. Fleet, M.E., Univ. of Western Ontario:
Phase chemistry of iron-sulphide minerals, 1966-68.
167. Folinsbee, R.E., Univ. of Alberta, Galt, J., Maxwell, J.A.,
Douglas, J.A.V., Geol. Surv. Can.:
Revelstoke meteorite, British Columbia, 1964-67.
Analysis of Revelstoke carbonaceous chondrite, report on the
fall and recovery. See Fall of Revelstoke Stony Meteorite, Canada;
The Meteoritical Bulletin, No. 34, November, 1965.

168. Fortescue, J.A.C., Hornbrook, E.A.W., Geol. Surv. Can.:
Biogeochemical investigations, 1963-68.
To develop and evaluate techniques for exploring for minerals
by sampling trees and other plants. See Geol. Surv. Can., Paper
67-1A, 1967, p. 200.
169. Fritz, P., Univ. of Alberta:
Stable carbon-oxygen isotope variation in sedimentary materials,
1966-.
170. Gélinas, L., Ecole Polytechnique, Université de Montréal:
Etude géochimique des métagabbros, amphibolites et schistes
pélitiques des régions des lacs Thévenet, Gabriel et Fort-
Chimo, Nouveau-Québec, 1966-68.
Cette étude porte sur l'évolution des assemblages minéral-
ogiques des schistes pélitiques et des roches méta-éruptives
mafiques et ultramafiques en fonction de l'accroissement du méta-
morphisme. La représentation graphique de ces assemblages met
en évidence leur état d'équilibre.
171. Giguère, J., Univ. of Ottawa:
Distribution of elements among coexisting pyroxenes of high-grade
metamorphic rocks from Somerset Island, Northwest
Territories, 1965-67; M.Sc. thesis.
172. Gill, J.E., Krishnamurthy, P., Eckstrand, N.L., McGill Univ.:
Mobility of sulphides - a continuing study.
See Experimental investigation of chalcocite: annealing and
plastic deformation at elevated temperatures; Can. Jour. Earth
Sciences, vol. 2, pp. 98-117, 1965.
173. Gittins, J., York, D., Univ. of Toronto:
The $\text{Sr}^{87}/^{86}$ ratio of metamorphosed limestones, 1963-66.
See The significance of Sr isotope ratios in theories of car-
bonatite genesis; Nature, vol. 207, pp. 625-626, 1965.
174. Goodman, R.H., Mines Branch, Dept. of Energy, Mines and
Resources:
The Mössbauer effect in (Zn, Fe)S solid solutions, 1964-66.
The objectives are to study the electric and magnetic environ-
ment of iron nuclei in (Zn, Fe)S solid solutions as a function of
temperature, concentration of impurities and the effects of surface
ions, using the Mössbauer effect in Fe-57. See The Use of an On-
Line Computer for Mössbauer Effect Experiments, Rev. Sci. Inst.
vol. 37, No. 3, 1966.

Valence states of iron in pyrrhotite, 1965-66.

The objective is to determine the valence states of iron in pyrrhotite by the use of the Mössbauer effect.

175. Grootenboer, J., McMaster Univ.:

An investigation of the fractionation of sulphur isotopes S^{32} and S^{34} between co-existing sphalerite and galena in synthetic and natural equilibrium assemblages, 1966-69; Ph.D. thesis.

Partition coefficients will be measured on synthetic sulphides produced at temperatures between 250 °C and 700 °C and the vapour pressure of the system and compared with theoretical calculations. Results obtained will be applied to natural sphalerite and galena occurrences.

176. Gross, W.H., Univ. of Toronto:

The composition of some serpentinites in Eastern North America, 1965-67.

Approximately 100 samples from locations stretching from Alabama to northern Ontario are being analyzed.

177. Gunn, B.M., Université de Montréal:

Geochemistry of Rattlesnake Syenogabbro, 1966-67.

Geochemistry of Guadalajara volcanics, 1966-67.

Compute solution of matrix effects in X-ray spectrometry, 1966-67.

178. Harriss, R.C., McMaster Univ.:

Chemical weathering of volcanic rocks from Puerto Rico, 1966-.

Study of mineralogical and chemical transformations related to the weathering of volcanic rocks in a tropical environment.

Nucleation of calcium carbonate in natural water systems, 1966-.

A study of the factors controlling the kinetics of calcium carbonate nucleation in ocean and lake waters.

Chemistry of freshwater invertebrate skeletal material, 1966-.

Study of the factors controlling the transfer of trace metals from aqueous systems to carbonate shell material with particular emphasis on calcification mechanisms.

Trace element chemistry of natural fresh water systems, 1966-.

Ba and Sr are being determined spectrographically and Ag and Co by neutron activation in rivers and lake waters in order to elucidate factors controlling the solubility of individual metals.

179. Iwasaki, H., Bright, N.F.H., Mines Branch, Dept. of Energy, Mines and Resources:

Studies in the titanium-oxygen system, 1965-66.

This study was aimed at elucidating certain outstanding problems in the complex Ti-O system— (1) in relation to the behaviour of compositions close to the stoichiometric TiO composition, which exhibit somewhat unusual stability behaviour and (2) in relation to the polymorphism of the oxide Ti_3O_5 , one form of which is closely related to the mineral pseudobrookite, $\text{Fe}_2\text{O}_3 \cdot \text{TiO}_2$.

180. Janes, J.R., Univ. of Toronto:
Symbolic treatment of field and analytical data as applied to geologic mapping, 1966-67; M. E. thesis.
181. Jennings, D.S., McMaster Univ.:
Origin and geochemistry of part of the Hermon Formation near Bancroft, Ontario, 1964-68; Ph.D. thesis.
An attempt to determine the protoliths of the various units in the Hermon Formation, Grenville-type metasediments of upper almandine amphibolite grade in the Hastings lowlands of northern Ontario; includes an integrated study of stratigraphic relationships, whole rock analyses fitted to depositional models, zircon morphology studies and transition metal trends.
182. Jolliffe, A.W., George, P.T., Queen's Univ.:
A geochemical study of ores and rocks in the Porcupine-Kirkland Lake area, 1963-66; M.Sc. thesis (George).
A detailed geochemical study involving chiefly trace-element patterns in millhead, vein, and wallrock samples from the Timmins-Kirkland Lake area.
183. Jongejan, A., Wilkins, A.L., Mines Branch, Dept. of Energy, Mines and Resources:
High-temperature phase equilibrium studies in the system $\text{CaO-Nb}_2\text{O}_5\text{-TiO}_2$, 1962-66.
Study of the range of temperature and compositional stability leading to the formation of niobium-bearing perovskites, titanium-bearing pyrochlores, etc. The binary system $\text{CaO-Nb}_2\text{O}_5$ is known from other work at the Mines Branch. The binary systems CaO-TiO_2 and $\text{Nb}_2\text{O}_5\text{-TiO}_2$ are known from outside work. There is the indication of the formation of at least one ternary compound in the $\text{CaO-Nb}_2\text{O}_5\text{-TiO}_2$ system. A considerable knowledge of the phase stability fields has been acquired concerning the ternary system.
184. Jordan, F.W., McMaster Univ.:
Origin of an horizon of carbonate concretions in one of the Hamilton shale members near Buffalo, New York, 1965-67; M.Sc. thesis.

Study of the chemical system that leads to formation of carbonate concretions.

185. Keays, R.R., McMaster Univ.:
Study of the geochemistry of the metals palladium, platinum, iridium and gold in the minerals of the Sudbury camp, Ontario, 1962-67; Ph.D. thesis.
A method for the simultaneous determination of the metals by neutron activation analysis has been developed and is being employed to study coexisting sulphide minerals from the Sudbury camp.
186. Kirkham, R.V., British Columbia Dept. of Mines and Petroleum Resources:
Geothermometry and mineral zoning of metalliferous deposits in the Hudson Bay Mountain area, west-central British Columbia, 1963-67; Ph.D. thesis.
187. Kretschmar, U., McMaster Univ.:
Determination of oxygen fugacity and temperature of formation of an anorthosite near Parry Sound, Ontario, 1966-68; M.Sc. thesis.
A trace element analysis and electron probe study of oxides from an anorthosite is being undertaken with a view to determining the oxygen fugacity and temperature of formation.
188. Kretz, R., Univ. of Ottawa:
Study of metamorphic rocks, 1955-.
See Grain-size distribution for certain metamorphic minerals in relation to nucleation and growth; Jour. Geol., vol. 74, pp. 147-173, 1966.
189. Lerbekmo, J.F., Campbell, F.A., Univ. of Alberta:
Chemical composition of Cretaceous shales in Alberta, 1961-67.
See Mineralogic and chemical variations between Upper Cretaceous continental Belly River shales and marine Wapiabi shales in Western Alberta, Canada; Sedimentology, vol. 2, pp. 215-226, 1963.
190. Lin, S.B., McMaster Univ.:
Equilibria of system of diopside-fluorite, 1966-; M.Sc. thesis.
191. MacLean, W.H., McGill Univ.:
Liquidus phase relations in the system $\text{FeS-FeO-Fe}_3\text{O}_4\text{-SiO}_2$ and their geologic implications, 1965-67; Ph.D. thesis.
Previous investigations in the system FeS-FeO-SiO_2 have shown a liquid immiscibility gap between an iron silicate-rich and an iron

sulphide-rich liquid. The present work has confirmed this gap and extended the phase relations towards the Fe_3O_4 end of the resulting quaternary system. From this work models can be presented outlining cooling and crystallization paths which could result in the separation and possible accumulation of a sulphide-rich portion of the melt.

192. Malick, K.A., McGill Univ.:
Weathering of rocks and mobility of elements in soil profiles,
Mount St. Hilaire, Quebec, 1966-67; M.Sc. thesis.
193. Maxwell, J.A., Geol. Surv. Can.:
Investigation of field sampling errors, 1965-67.
To determine magnitude of error in composition of replicate
samples taken in the field for subsequent compositional analysis.
194. McCartney, W.D. and graduate students, Queen's Univ.:
Study of trace element content and variations in sulphides of
selected ore deposits, 1966-.
195. Mitchell, R.H., McMaster Univ.:
Rb and Sr isotope analysis of basic and ultrabasic rocks, 1966-;
Ph.D. thesis.
This research, by means of solid source mass spectrometry
and neutron activation processes is being applied to the solution of
various petrogenetic problems including (a) whether or not the
various facies of the Sudbury eruptive are co-magmatic and (b)
study of the geochronology-genesis of the Mt. Albert dunite.
196. Moore, J.C.G., Mount Allison Univ.:
Rock geochemistry as an aid in the search for orebodies, 1963-68.
Includes sampling and analyses of the rocks around massive
sulphide orebodies in New Brunswick to determine if detectable
trace elements as well as major elements can be used to lead to
the discovery of additional mineral deposits in the province. The
objective is to find haloes of dispersed elements of target indicators
that will enlarge the target areas for mineral exploration.
197. Perrault, G., Ecole Polytechnique, Université de Montréal:
Analytical methods for trace element studies of rocks, 1965-68.
Four analytical methods of determination of trace element
constitution of rocks are being tested for studying lavas of the
Doublet Group in Labrador: atomic absorption spectrophotometry,
X-ray fluorescence, colorimetric and emission spectrography.
See Spectrophotométrie d'absorption atomique: une mise en garde
sur la préparation des étalons de comparaisons; Canadian
Spectroscopy, vol. 11, No. 1, January 1966.

198. Perrault, G., Dumesnil, J.C., Ecole Polytechnique, Université de Montréal:

La part de la fluorescence X dans l'analyse totale des roches, 1965-66; thèse de maîtrise (Dumesnil).

199. Philpotts, A.R., McGill Univ.:

The system magnetite-apatite-silicates, 1966.

In the system magnetite-fluorapatite there is a eutectic at approximately 24 weight per cent apatite, a composition that corresponds very closely to natural rocks consisting of these minerals. Eutectic liquids of magnetite and apatite are immiscible from silicate melts having the composition of the diorite dykes which are so commonly associated with magnetite-apatite rocks. See Origin of certain iron-titanium oxide and apatite rocks; Econ. Geol. (in press).

Parental magma of the anorthosite-mangerite suite, 1960-.

Field evidence indicates that anorthosites may have formed in some cases from basaltic magmas, and in others from dioritic or more siliceous magmas. The effect of contamination of a basaltic magma by granitic melts is being investigated experimentally. Basalts that crystallize olivine first will, on being contaminated by granitic melt, crystallize plagioclase first. This provides a mechanism by which anorthosites can be formed when basaltic magma is intruded into the base of an orogenic belt. See The origin of the anorthosite-mangerite rocks in southern Quebec; Jour. Petrol., vol. 7, pp. 1-64, 1966.

Experimental investigation of the differentiation of alkaline rocks, 1966-.

As a result of many studies of the Monteregian alkaline province much evidence has been obtained on the differentiation of alkaline rocks. A program is now under way to investigate experimentally the different processes of differentiation. Many of the Monteregian dyke rocks contain features which suggest that the two main rock types of the Monteregian province, the gabbro and the nepheline syenite, are the products of liquid immiscibility. This possibility is being investigated experimentally at present. It is also proposed to investigate the role of vapour transport of different elements through silicate melts.

200. Phipps, D., McGill Univ.:

Geochemistry of clays, 1965-67; Ph.D. thesis.

201. Piotrowski, J.M., Edgar, A.D., Univ. of Western Ontario:

Phase relations in the system $\text{Li}_2\text{O}-\text{Al}_2\text{O}_3-\text{Na}_2\text{O}-\text{SiO}_2-\text{H}_2\text{O}$ with studies of the $\alpha - \beta$ spodumene transition, 1964-67; Ph.D. thesis (Piotrowski).

See The system $\text{LiAlSi}_2\text{O}_6 - \text{NaAlSi}_3\text{O}_8$ at 2 kilobars $\text{P}_{\text{H}_2\text{O}}$.
Trans. Amer. Geophys. Union. vol. 47, p. 208 (abstract), 1966.

202. Platt, R.G., Edgar, A.D., Univ. of Western Ontario:
Phase relations in the system SiO_2 - $\text{NaAlSi}_3\text{O}_8$ - KAlSi_3O_8 + 2 and 6
weight % HF at 1 kilobar $\text{P}_{\text{H}_2\text{O}}$, 1966-68; M.Sc. thesis (Platt).
203. Prasad, N., McMaster Univ.:
Study of oxygen and carbon isotopic ratios and their bearing on
geological phenomena in some Silurian carbonate rocks, 1964-
67; M.Sc. thesis.
The $\text{O}^{18}/\text{O}^{16}$ and $\text{C}^{13}/\text{C}^{12}$ isotopic ratios of dolomitic lime-
stones and dolomites of the Gasport Member of the Lockport
Formation of Ontario and New York State, and of the Tonoloway
Formation of Pinto, Maryland, are being studied. It is hoped to
interpret the origin of dolomite in carbonate rocks by these means.
204. Prince, A.T., Rowland, J.F., Wilkins, A.L., Mines Branch, Dept.
of Energy, Mines and Resources:
High-Temperature phase equilibrium studies in the System CaO -
 Nb_2O_5 - SiO_2 , 1956-1966.
The quench technique for silicate equilibrium studies together
with hot-stage microscopy techniques for liquidus temperature
determinations have been used to find the fields of primary crystal-
lization in the ternary system. X-ray diffraction studies on natural
and synthetic calcium niobates have been conducted. See two
papers on the Nb_2O_5 - SiO_2 and CaO - Nb_2O_5 systems in Jour. Amer.
Ceramic Soc., vol. 45, pp. 221-222 and 329-334 (1962). Publica-
tion on ternary system will follow shortly.
205. Rambaldi, E., Smith, M.E., Univ. of Ottawa:
Distribution of elements among coexisting feldspars of metamor-
phic rocks from the Madoc area, Ontario, 1965-68; Ph.D.
thesis (Rambaldi).
206. Roeder, P.L., Hill, R., Queen's Univ.:
The role of oxygen fugacity in the crystallization of basic igneous
rocks, 1962-; Ph.D. thesis (Hill).
See Experimental data for the system MgO - FeO - Fe_2O_3 -
 $\text{CaAl}_2\text{Si}_2\text{O}_8$ - SiO_2 and their petrologic implications; Am. J. Sci.,
vol. 264, pp. 428-480, 1966.
207. Rucklidge, J.C., Univ. of Toronto:
X-ray emission microanalysis of rock forming minerals,
1966-67.
An extensive series of chemically analyzed amphibole speci-
mens are being examined by electron microprobe techniques. The

data will be processed by computer, as described in the following reference, and the results will provide comparative information on the two methods of analysis. See A computer program for processing microprobe data; Jour. Geol., January 1967.

208. Sangster, D.F., Geol. Surv. Can.:
Geochemistry of lead-zinc deposits in carbonate rocks, 1965-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 212-213.
209. Sasaki, A., Fritz, P., Folinsbee, R.E., Krouse, R., Cumming, G.L., Jackson, S., Singh, R., Univ. of Alberta:
Isotope studies, Pine Point, Northwest Territories - a continuing project.
Sulphur, oxygen and lead isotope studies of Pine Point with a view to establishing genesis of the deposit. See Sulphur isotope and the Pine Point lead-zinc deposits, Northwest Territories; Geol. Soc. America Annual Meeting, San Francisco, 1966 (Abstract).
210. Saull, V., McGill Univ.:
The application of calorimetric methods in geological studies, 1953-.
The use of solution calorimetry to determine the heats and rates of natural reactions involving minerals.
211. Schwarcz, H.P., McMaster Univ.:
Study of U^{234}/U^{238} activity ratio in tektites.
Use of functional relation between two or more trace element abundances to determine whether a given metamorphic rock type is of metasedimentary or meta-igneous origin.
Crystal field stabilization energy as a factor in determining trace transition element partitioning between coexisting metamorphic minerals.
Study of the origin of charnockites.
212. Scoates, R.F.J., Manitoba Mines Branch:
Petrology, geochemistry and petrogenesis of mafic and ultramafic rocks and related sulphides and feldspar porphyry dykes of the Rice Lake-Beresford Lake area, southeastern Manitoba, 1966-71 (Project Pioneer).
213. Scott, J.D., Queen's Univ.:
Study of minerals and phase relations in the ternary system $PbS-SnS-Sb_2S_3$, 1966-68; Ph.D. thesis.
214. Shafiqullah, M., Carleton Univ.:
Chemistry of Canadian Craters, 1965-68, Ph.D. thesis.

Aspects of the chemistry of country rocks, and breccias and igneous-like rocks exhibiting varying degrees of shock and melting are being investigated. Emphasis is on the Brent and Clearwater Lake structures. Core and surface samples are provided by the Dominion Observatory and the Geological Survey.

215. Sims, W.A., Quebec Dept. of Natural Resources (part time), Mt. Allison Univ.:
Study of heavy mineral distribution in the vicinity of the Gaspé Copper and Federal Metals Corp. mining camps, Holland and Lemieux townships, Gaspé-North county, Quebec, 1964-67.
216. Sirois, L.L., Mines Branch, Dept. of Energy, Mines and Resources:
Determination of electrical characteristics of metallic oxides and silicate minerals by electrophoresis and streaming potential, 1966-.
217. Skippen, G.B., Carleton Univ.:
An experimental study of the metamorphism of carbonate rocks, 1967-69.
Involves the measurement of equilibrium constants for reactions occurring among the phases quartz, calcite, dolomite, talc, tremolite, diopside, forsterite, wallastonite and enstatite. See Igneous and metamorphic reactions involving gas equilibria, in P.H. Abelson, ed., *Researches in Geochemistry*, vol. 2, New York, John Wiley and Sons.
218. Smith, D.G.W., Univ. of Alberta:
Petrology, geochemistry and vulcanology of Ascension Island, 1964-68.
See Oxford expedition to Ascension Island, 1964; *Nature*, 204, pp. 722-724, 1964.
219. Smith, F.G., Univ. of Toronto:
Computation and plotting of crystal-liquid equilibria in multi-component systems, 1963-73.
Current work on this project consists of bibliographic search of the literature on systems including alkali halides. A system suitable for computer manipulation has been designed and will be tested. See Computation and plotting of liquidus isotherms in multicomponent silicate systems; *Can. Mineral.*, No. 8, pp. 424-430, 1966.
220. Sood, M.K., Edgar, A.D., Univ. of Western Ontario:
Hydrothermal chemistry of iron-bearing melilites, 1965-67; M.Sc. thesis (Sood).

221. Speelman, E.L., McMaster Univ.:

The sulfur isotopic composition of sulfides and sulfur-bearing silicate minerals from rocks of the Haliburton-Bancroft-Madoc area of the Grenville Province, 1961-67; Ph.D. thesis.

An attempt to use sulphur isotope abundances as tracers in order to determine the extent to which sulfur is mobile. Complementary to this, a study is being made of sulfide-sulfide and sulfide-sulfate fractionations between coexisting mineral pairs.

222. Sutherland-Brown, A., British Columbia Dept. of Mines and Petroleum Resources:

Investigation of mercury dispersion haloes, 1965-67.

See Investigation of mercury dispersion haloes around mineral deposits in central British Columbia; Symposium on Geochemical Prospecting, Geol. Surv. Can., Paper 66-54, 1966.

223. Turnock, A.C., Univ. of Manitoba:

Melting relations of pyroxenes En-Fs-Wo.

The temperatures over the liquidus and solidus surfaces of the system En-Fs-Wo are being determined at a total pressure of 1 atm. and controlled partial pressure of oxygen. See Preliminary Results on Melting Relations of Synthetic Pyroxenes on the Diopside-Hedenbergite Join. Carnegie Inst. Wash. Year Book 61, 82, 1962.

224. Turnock, A.C., Bright, N.F.H., Mines Branch, Dept. of Energy, Mines and Resources:

Phase equilibrium studies in the system Mn-Ta-O, 1964-66.

A study of the range of temperature and compositional stability of tantalate and related minerals and of their synthetic analogues. See Mn-Ta Oxides: Phase Relationships at 1200°C, Jour. Amer. Ceram. Soc. vol. 49, No. 7, pp. 382-384, 1966.

Phase equilibrium studies in the system Fe-Ta-O, 1962-66.

A study of the range of temperature and compositional stability of tantalate minerals of the types tantalite, wodginite, tapiolite, xiolite, etc., and their synthetic analogues. See Non-stoichiometric Tantalum Magnetites, Jour. Amer. Ceram. Soc. vol. 49, No. 3, pp. 17-171, 1966.

Phase equilibrium studies in the system Fe-Nb-O, 1962-66.

A study of the range of temperature and compositional stability of niobate minerals such as columbite, pyrochlore and related niobium- and tantalum-bearing minerals and their synthetic analogues. See Fe-Nb Oxides - Phase Relations at 1180°C, Jour. Amer. Ceram. Soc., vol. 49, No. 4, pp. 177-180, 1966.

225. Vanden Berg, A., Research Council of Alberta:
Groundwater movement and groundwater chemistry in the Hand Hills-Bullpound Creek area, Alberta, 1963-67.
Includes detailed mapping of the chemical quality of the groundwater; mapping of groundwater discharge and recharge areas from surface indications and piezometric data; stratigraphy of the Edmonton and Paskapoo Formations from borehole data and bed-rock exposures; investigation into the origin of anomalous calcium-magnesium ratios observed in groundwater through chemical analysis of borehole samples.
226. Van Loon, J.C., Univ. of Toronto:
An investigation of the determination of iron II and iron III in silicates, 1964-68.
See Titrimetric determination of iron II in silicates using potassium iodate; *Talanta* 12, p. 599, 1965.
Application of atomic absorption spectrophotometry to silicate analysis, 1966-.
Application of modern electrochemical methods to silicate analysis, 1966-.
Application of gas chromatography to silicate analysis, 1966-.
227. Van Loon, J.C., Aarden, H.M., Univ. of Toronto:
Chemical analysis of a group of complex zirconium-rare earth-calcium silicates, 1965-67; Ph.D. thesis (Aarden).
228. Van Loon, J.C., Kingston, P.Q., Paresis, C., Univ. of Toronto:
Analysis of very small amounts of sulfosalt minerals, 1965-66; M.A. thesis (Kingston).
229. Webber, G.R., McGill Univ.:
Application of instrumental methods of analysis to geological materials, 1959-.
See Comparison of chemical composition of soils and bedrock of Mount St. Hilaire, Quebec; *Can. Jour. Earth Sciences*, vol. 2, No. 2, pp. 44-58, 1965.
230. Williams, G.D., Univ. of Alberta:
Geochemistry of muds and shales, 1963-.
See Chemical composition of shales of the Mannville Group (Lower Cretaceous) of central Alberta, Canada; *Bull. Amer. Assoc. Petroleum Geologists*, vol. 49, pp. 81-87, 1965.
231. Williamson, D.H., Laurentian Univ. of Sudbury:
Bulk chemical analyses of rocks from Caledonia Mountain, south-eastern New Brunswick, 1966-68.

An attempt is being made to correlate the numerous plutons within the study area by establishing a procedure for the bulk chemical analysis of samples by X-ray fluorescence methods.

232. Wilson, H.D.B., Univ. of Manitoba:
The igneous episodes in the Superior Province, Canadian Shield, 1964-.
The chemical nature of the principal igneous episodes is being determined by chemical analysis. Thus far, these include the Archaean lavas, the Kenoran granitic intrusions, the "Keeweenawan" diabases and lavas, the late syenitic-alkaline plugs, and the intrusions and lavas along the boundary of the province. See Volcanic history of the Canadian Archaean Province; International Symposium on Volcanology, New Zealand, 1965.
233. Wynne-Edwards, H.R., Sauerbrei, J.A., Queen's Univ.:
Granitic rocks of the Frontenac Axis, Ontario, 1956-66; M.Sc. thesis (Sauerbrei).
A geochemical investigation and a mineralogical classification of the granitic rocks of the Frontenac Axis in the Grenville province, with a discussion of their relationship to each other and to the enclosing gneisses.

GEOCHRONOLOGY

234. Baadsgaard, H., Univ. of Alberta:
Thermally induced daughter element migration in igneous rocks, 1965-67.
235. Baadsgaard, H., Bird, G., Univ. of Alberta:
Geochronology of northeastern Alberta Precambrian Shield, 1959-. M.Sc. thesis (Bird).
236. Baadsgaard, H., de la Cruz, N., Univ. of Alberta:
Geochronology of bentonites, 1965-67; M.Sc. thesis (de la Cruz).
237. Baadsgaard, H., Folinsbee, R.E., Univ. of Alberta:
Geochronology of Harrison Lake area, British Columbia, 1966-.
238. Baadsgaard, H., Green, D., Univ. of Alberta:
Geochronology of Precambrian of Yellowknife area, Northwest Territory, 1965-69; Ph.D. thesis (Green).

239. Christie, R.L., Geol. Surv. Can., Dawes, P.R., Greenland Geological Survey:
Stratigraphy and age of Precambrian sedimentary rocks and contained sills and dykes, east coast of Arctic Islands and northwest and north Greenland, 1967-.
240. Cormier, R.F., St. Francis Xavier Univ.:
Rb-Sr dating of igneous rocks from southern New Brunswick, 1965-67.
The age of the Precambrian(?) Coldbrook Group is being investigated.
241. Crockett, J.H., McMaster Univ.:
Construction and development of a solid source mass spectrometer for Rb-Sr work.
Instrument will be used primarily for the study of ultrabasic rocks - for Rb-Sr age determination.
242. Doig, R., McGill Univ.:
Isotope geology, 1964-.
K/Ar and Rb/Sr isotopic studies of Chatham-Grenville type rocks, Monteregeian rocks, and anorthosites. K/Rb ratio studies of rocks of the anorthosite-mangerite series.
243. Dyck, W., Geol. Surv. Can.:
Carbon-14 ages of Douglas Fir tree rings, Vancouver Island, 1962-66.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 35-37.
244. Farquhar, R.M., and graduate students, Univ. of Toronto:
Geochronology and isotope geophysics.
245. Farrar, E., Gupta, V.K., Queen's Univ.:
Geochronology, 1966-; M.Sc. thesis (Gupta).
It is intended to calculate the age of mineral samples by comparing the number of spontaneous U^{238} fission tracks with the number of fission tracks artificially produced by fission of U^{235} in a nuclear reactor. It is hoped that K-Ar dating can be started in which case ages determined using fossil fission tracks will be compared with the K-Ar ages.
246. Gittins, J., York, D., Univ. of Toronto:
Ages of alkaline rocks and carbonatites in Eastern Canada, 1964-67.
A systematic study of the age distribution of carbonatite and feldspathoidal magmatism in Ontario and Quebec suggests four ages at 100-125 m.y., 560 m.y., 1,000 m.y., and 1,700 m.y. Carbonatites of both 1,000 m.y. and 1,700 m.y. ages occur widely in the Superior Province. See The ages of carbonatite complexes in Eastern Canada; Can. Jour. Earth Sciences, in press.

247. Gittins, J., York, D., Univ. of Toronto:
Argon retentivity of nepheline, sodalite, cancrinite and zeolites,
1963-68.
The argon retentivity of feldspathoidal minerals and zeolites
is being established relative to biotite. Nepheline appears to retain
argon well while sodalite and cancrinite contain great excesses of
radiogenic argon.
248. Lowdon, J.A., Wanless, R.K., Robertson, I., Geol. Surv. Can.:
Age of carbonaceous materials using radiocarbon dating techniques,
1959-.
249. McNutt, R.H., McMaster Univ.:
Rb-Sr study of the Mt. Albert ultrabasic rocks, Quebec.
It is hoped to obtain an isochron on the pluton and to study the
Rb-Sr age and redistribution of Rb, Sr and Sr^{87} in the contact
aureole.
250. Mitchell, R.H., McMaster Univ.:
Rb and Sr isotope analysis of basic and ultrabasic rocks, 1966-;
Ph.D. thesis.
This research, by means of solid source mass spectrometry
and neutron activation processes is being applied to the solution of
various petrogenetic problems including (a) whether or not the
various facies of the Sudbury eruptive are co-magmatic and (b)
study of the geochronology-genesis of the Mt. Albert dunite.
251. Turek, A.C., Manitoba Mines Branch:
Geochronology of Rice Lake-Beresford Lake area, Manitoba,
1966-71 (Project Pioneer).
Using the Rb-Sr facilities being set up at the Univ. of
Manitoba.
252. Wanless, R.K., Koepfel, V., Geol. Surv. Can.:
Age of Beaverlodge, Alberta minerals, 1964-66.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 37-38.
253. Wanless, R.K., Stevens, R.D., Geol. Surv. Can.:
Isotopic studies, Canadian Shield, 1965-66.
Includes age measurements, and controlled laboratory experi-
ments. See Geol. Surv. Can., Paper 67-1A, 1967, p. 218.
254. Wilson, H.D.B., Brisbin, W.C., Hall, D.H., Hajnal, Z., McGrath,
P., Univ. of Manitoba:
Nature of the Canadian Shield in Manitoba and northwestern Ontario,
1960-; Ph.D. thesis (McGrath).
A joint project, regional geology and gravity, Wilson and
Brisbin; magnetic, Hall and McGrath; seismic, Hall and Hajnal and
Brisbin; age dating, G.S. Clark.

GEOPHYSICS

Electrical

255. Andrieux, P., Clark, J.F., Dominion Observatory:
Study of meteoritic crater by electrical prospecting method, 1964-67.
256. Becker, A., Geol. Surv. Can.:
Development of new electrical method of geophysical mapping of surficial deposits and sulphide conductors, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 1301-131 and 197.
Development of magnetic-telluric method for geophysical mapping, 1966-70.
257. Becker, A., Bhattacharyya, B.K., Geol. Surv. Can.:
Interpretation of time domain electromagnetic measurements, 1967-68.
The primary objective of this theoretical study will be the development of a quantitative interpretation scheme for preparing an apparent ground conductivity map from pulsed electromagnetic system data.
258. Bhattacharyya, B.K., Geol. Surv. Can.:
Quantitative interpretation of airborne electromagnetic data, 1966-.
259. Collett, L.S., Ahrens, R.H., Geol. Surv. Can.:
Experimental surveys with low frequency induced polarization equipment.
The purpose is to determine the ability of this newly developed equipment to identify and delineate surficial deposits including those likely to contain groundwater. Tests will be made in locations where there is good geological control. See Geol. Surv. Can., Paper 66-2, 1966, pp. 6-9.
260. DeLaurier, J.M., Yukutake, T., Dominion Observatory:
Electromagnetic induction vectors, 1965-66.
Computer analysis of three-component geomagnetic recordings determines eddy currents induced in a conductor by geomagnetic source variations. The interpretation results in a knowledge of the gross geologic structure to depths of 100 km.
261. Garland, G.D., Hermance, J., Univ. of Toronto:
Investigation of electrical conductivity in tectonically active areas, 1963-.

To determine if anomalies in electrical conductivity within the earth, as revealed by measurements of variations in the earth's magnetic field, are related to temperature differences (as has been suggested). Measurements have been made at stations across Iceland and the Azores.

262. Keys, J.D., Baleshta, T.M., Mines Branch, Dept. of Energy, Mines and Resources:
Electrical properties of sulphide minerals, 1965-67.
The objective is to determine the mechanism of electrical conductivity in sulphide minerals.
263. Wyder, J.E., Collett, L.S., Geol. Surv. Can.:
Testing side-wall sampler in Pleistocene sediments, Winkler area, Manitoba, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 128-129.

Gravity

264. Berkhout, A., Dominion Observatory (part time):
Gravity interpretation of Somerset, Prince of Wales, and northern Baffin Island, 1965-67; Ph.D. thesis.
Gravity survey, northern Ellesmere Island and northwest Greenland, 1966.
140 gravity stations were established over the area surrounding Alert and in Greenland between Newman Bay and Sherard Osborne Fiord. Preliminary results indicate that the steepest gravity gradient occurs along the eastern coast of Ellesmere Island parallel to Robeson Channel.
Gravity survey, northern Baffin Island, 1966.
With the establishment of 616 stations on Borden and Brodeur Peninsula the regional gravity survey of Baffin Island, started in 1961, was completed.
265. Brisbin, W.C., Univ. of Manitoba:
Gravity studies in the Rice Lake Area, Manitoba, 1965-68.
Part of a detailed geological and geophysical study by the Manitoba Mines Branch and the University of Manitoba covering the northern boundary of the English River gneissic belt, the Rice Lake volcanic sedimentary belt and associated granitic intrusions.
266. Brulé, B.G., Dominion Observatory:
West coast underwater gravity survey, 1966.
A total of 234 underwater gravity measurements spaced at intervals of 10 to 15 km was established with the CNAV Laymore

on the west coast of Canada. Regional mapping was carried out in Dixon entrance and readings in traverse form were obtained in Hecate Strait, Queen Charlotte Sound, the Straits of Georgia, and in several fiords. The underwater gravity results will be included in a reconnaissance study of the Canadian Cordillera being made by Dr. R.A. Stacey.

Gravity observations, Polar Continental Shelf, 1966.

A total of 57 gravity observations were made over three long-range off-shore profiles between latitudes 78°N to 80°N and between longitudes 116°W and 132°W.

267. Buck, R.J., Dominion Observatory:

Gravity surveys in Western Canada, 1958-67.

Nine maps are completed covering an area of 300,000 square miles in the Prairie Provinces between latitudes 49°N and 54°N, and longitudes 96°W and 116°W. Detailed interpretation of the gravity field will be the subject of a future report. See The gravity anomaly field in Western Canada (with maps); Gravity Map Series, Dom. Obs. Maps Nos. 37, 38, 39, 40, 41, 42, 43, 44, 49, 1966.

268. Carlson, V.A., Research Council of Alberta:

Gravity exploration for a buried channel near High Prairie, Alberta.

A large, negative gravity anomaly has been found near High Prairie. It was thought to be connected with a deeply buried pre-glacial channel. Test drilling has been carried out to determine the density of the bedrock and overburden materials encountered.

269. Gibb, R.A., Dominion Observatory:

Interpretation of gravity anomalies in northern Manitoba, 1965-67.

See A geological interpretation of the Bouguer anomalies adjacent to the Churchill-Superior boundary in northern Manitoba (in preparation).

270. Gibb, R.A., McConnell, R.K., Dominion Observatory:

Gravity surveys in northern Manitoba and northeastern Saskatchewan 1965-68.

See The gravity anomaly field in northern Manitoba and northern Saskatchewan (with maps); Gravity Map Series, Dom. Obs. Maps Nos. 68, 69, 70, 71, 72 and 73.

271. Hornal, R.W., Dominion Observatory:

Gravity survey in the Coppermine area, 1965-66.

See The gravity anomaly field in the Coppermine area, Northwest Territories; Gravity Map Series, Dom. Obs. Map No. 45, 1966.

272. Hornal, R.W., Boyd, J.B., Dominion Observatory:
Gravity survey of District of Mackenzie, Northwest Territories,
1966-.
- Some 4696 stations were established to investigate the gravity field over the Bear and Slave geological provinces and also to delineate the extension of the Coppermine gravity high outlined during the 1962 field season. The survey area included some 250,000 square miles between latitudes 62°N and 70°N and between longitudes 102°W and 120°W . About 2,300 rock samples were collected and catalogued. The results and a preliminary analysis are being prepared for publication in the Gravity Map Series.
273. Innes, M.J.S., Goodacre, A.K., Weston, A.A., Weber, J.R., Dominion Observatory:
Gravity survey, Hudson Bay, 1965-67.
- See Structural implications of gravity data for Hudson Bay and vicinity; Centennial Volume on Hudson Bay, 1967 (in press).
274. Innes, M.J.S., Weston, A.A., Dominion Observatory:
Gravity interpretation in Appalachia, 1965-66.
- Analysis of gravity data indicates that the marked gravity high over the Green-Sutton mountain anticlinorium, and an adjacent gravity low to the west or northwest cannot be explained entirely by the surface geology, and deep-seated sources at the base of the crust or in the upper mantle, are necessary. These major gravity trends which mark the boundary between Appalachia and the Shield are persistent and extend south to Alabama, and northeast to Newfoundland. Statistical analyses show that Bouguer and free air anomalies are 30 milligals greater over the Appalachians than the adjoining Precambrian Shield. The Appalachian region is under-compensated by 20 milligals while the Shield is over-compensated by about 10 milligals. These gravity results are inconsistent with the crustal thicknesses determined seismically, but consistent with the higher seismic velocities indicating a denser crust underlying Appalachia. See Gravity measurements in Appalachia and their structural implications; Proc. Roy. Soc. Can., Sym. on Appalachia Tectonics, 1966.
275. McConnell, R.K., Dominion Observatory:
Gravity survey in western Quebec, 1959-67.
- See Gravity field over the Grenville Front in western Quebec; Gravity Map Series, Dom. Obs. Map Nos. 22, 23, 24, 27, 47 (in preparation).
276. Sobczak, L.W., Dominion Observatory:
Gravity survey, Hecla and Griper Bay, Northwest Territories.

A total of 371 gravity stations were established on the surface of the ice off northern coast of Melville Island, at approximately 4 mile intervals. Bouguer gravity anomalies range from +5 mgal just east of Cape Grassy to - 10 mgal near Sabine Peninsula. Rock densities in the Arctic Archipelago, 1966.

A summary of 1,500 density determinations made in the Canadian Arctic Archipelago north of latitude 71°N and west of longitude 84°W is presented in the form of 6 tables and 6 figures. Densities determined from sonic velocity logs representing over 27,000 feet of drill hole indicate the most reliable in situ densities. The average velocity density of 2.83 g/cm³ as determined for the Devonian sediments of the Winter Harbour Well located on Melville Island agrees well with the density of 2.40 g/cm³ that gives the smoothest reduced gravity profile over Melville Island.

277. Sobczak, L.W., Berkhout, A., Dominion Observatory:
Gravity surveys, Somerset and Prince of Wales Islands, Northwest Territories, 1965-67.
See Preliminary results of the gravity surveys over Somerset and Prince of Wales Islands; Gravity Map Series (in preparation).
278. Stacey, R.A., Dominion Observatory:
Canadian Cordillera survey, 1966-67.
Three E-W gravity profiles across the Rocky Mountains were made along Bench Mark routes where possible. Reduction of data along with terrain corrections is in process.
279. Tanner, J.G., McConnell, R.K., Dominion Observatory:
Gravity surveys in Quebec and Labrador, 1959-67.
See The gravity field of the southern Ungava Peninsula; Gravity Map Series, Dom. Obs. Map Nos. 7, 8, 9, 10, 48 (in preparation).
280. Weaver, D.F., Dominion Observatory:
Gravity survey of Newfoundland, 1964-67.
Analysis of gravity data reveal a major gravity gradient across a line that trends northeasterly over the southern part of the Great Northern Peninsula. This line may mark the boundary between the Grenville and Appalachian geological provinces. The anomalies north of this line average about 30 mgal less than the anomalies in the southern area. Seismic work suggests a thinner lower density crust in the north where the anomalies are negative, and a thicker higher density crust in the southern area where the anomalies are generally positive. Calculations show that the results are compatible with the gravity data if density variations in the upper mantle contribute to the gravity field. In neither area does there appear to be any dependence of Bouguer anomaly on elevation.

A correlation of the local Bouguer anomalies with the surface geology suggests that granite is the prime cause of the negative anomalies of Newfoundland. The sediments, most of which are metamorphosed, appear to have very little effect on the gravity field. Most of the positive anomalies of Newfoundland correlate with large bodies of diorite or with gabbroic and ultrabasic intrusions. It is suggested that many of the longer wave-length regional variations in the gravity field are produced by changes in the crustal parameters at depth. See Preliminary results of the gravity surveys of the Island of Newfoundland (with maps); Gravity Map Series, Dom. Obs. Maps Nos. 53, 54, 55, 56, 57, 1966. Gravity survey in south-central Quebec and Labrador, 1964-.

See Preliminary results of gravity surveys in south-central Quebec and Labrador, with maps; Gravity Map Series, Dom. Obs. Maps Nos. 64, 65, 66, 67 and 68, 1966.

281. Weber, J.R., Dominion Observatory:
Penny Ice Cape survey, 1962-.

The relative position of 14 aluminum poles across the crest of the ice cap were resurveyed, the gravity differences between the poles and "Gravity Base" were remeasured, and the gravity change along the direction of the movement of the centre pole was observed. Stratigraphic snow analysis, density and temperature measurements were carried out at the centre station, elevation 1,838 m a.m.s.l. The 15 stakes across the outlet glacier were recovered and movement and ablation measured.

Heat Flow

282. Beck, A.E., Dimas, C., Univ. of Western Ontario:

Heat production in various rock units, 1966-; M.S. thesis (Dimas).

Radioactive heat production in rocks is one of the major sources of terrestrial heat flow. However, there has been very little systematic work done to correlate variations in terrestrial heat flow values with the heat production in the rocks from the area from which the heat flow measurements have been made. Apparatus is being assembled to measure the uranium, thorium and potassium content of rock units collected across Canada.

283. Beck, A.E., Sass, J.H., Anglin, F.M., Judge, A.S., Univ. of Western Ontario:
Heat flow instrumentation, 1958-.

284. Beck, A.E., Sass, J.H., Judge, A.S., Mustoren, E., Univ. of Western Ontario:
Heat flow measurements, 1958-; Ph.D. thesis, (Judge) M.Sc. thesis (Mustoren).
285. Jessop, A.M., Lewis, T., Dominion Observatory:
Heat flow, 1962-.
A program to measure heat flow in Canada using special purpose holes, and commercial holes drilled originally for other purposes. To date some nineteen thermal gradients have been measured, and final heat flow values for nine locations are planned for publication during 1967.
286. Law, L.K., Paterson, W.S.B., Dominion Observatory:
Heat flow investigations in the Canadian Arctic, 1964-.
The geothermal heat flow is determined using the ocean probe technique, over the continental shelf and the deep inter-island channels. See Additional heat flow determinations in the area of Mould Bay, Arctic Canada; Can. J. Earth Sci., vol. 2, No. 2, 1965.
287. McFadden, C.P., Smylie, D.E., Univ. of Western Ontario:
Thermal convection in a soft layer, 1965-68, Ph.D. thesis (McFadden).

Magnetic

288. Andersen, F., DeLaurier, J.M., Law, L.K., Dominion Observatory:
Magneto-telluric investigations in the Canadian Arctic, 1961-.
The areal extent and implications of the magnetic variation anomalies at Alert and Mould Bay in the Canadian Arctic are under investigation. See Magneto-telluric experiments in northern Ellesmere Island; Geophys. J.R. Astr. Soc., vol. 10, No. 4, 1966.
289. Becker, A., Flint, T.R., Geol. Surv. Can.:
Development of a magneto-telluric method of geophysical mapping, 1966-70.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 3.
290. Bhattacharyya, B.K., Geol. Surv. Can.:
Central Canada aeromagnetic project, 1966-67.
The study will be based on aeromagnetic data over parts of Saskatchewan, Manitoba, Ontario and the Northwest Territories. The objective is to determine distribution and trend of magnetized bodies deep in the crust; to study depth and undulation of the Curie-point geotherm; and to estimate the total magnetized vector associated with

magnetized bodies and thereby predict the boundary between the Superior and Churchill geological provinces in depth.
Digital filtering techniques applicable to geophysical data, 1966-.

The development of a method for determining the Fourier spectrum of potential field and other geophysical data over an area; the final objective is to separate accurately the effects of near surface and deep crustal sources on the potential field.

Interpretation of magnetic data over the Arctic Islands and Continental Shelf of Canada, 1966-67.

The objective is to determine the depth and structure of the basement; calculate the depths to the bottom of the magnetized bodies which is interpreted as the Curie-point geotherm; and to estimate the total magnetized vectors associated with magnetized bodies which are indicative of structural characteristics and age of consolidation of the basement rock masses.

Treatment of non equi-spaced aeromagnetic data, 1966-67.

The objective is to develop suitable methods for quantitative treatment of such data.

291. Bower, M.E. (Miss), Geol. Surv. Can.:
Digital filtering as an aid to aeromagnetic interpretation, 1965-.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 5-6.
292. Caner, B., Dominion Observatory:
Magnetic variation anomalies in Western Canada, 1965-68.
A joint project with University of British Columbia to verify experimentally the suggestion that inland geomagnetic variation anomalies can be correlated with seismic low Pn velocities, and that both lines of evidence lead to higher upper mantle temperature under western North America. Magnetic variation experiments in British Columbia were conducted in 1966 and magneto-telluric experiments are planned for 1967. See Geomagnetic depth sounding and correlation with other geophysical data in western North America; Nature, vol. 207, p. 927, 1965.
293. Carmichael, C.M., Palmer, C.H., Univ. of Western Ontario:
Potassium argon age determinations, 1966.
In order to obtain a reliable polar wandering curve it is necessary to date rocks on which paleomagnetic measurements have been made. To date this laboratory has had the age determinations made elsewhere but there are now so many samples that need to be dated that a potassium-argon laboratory is being set up.
294. DeLaurier, J.M., Law, L.K., Yukutake, T., Dominion Observatory:
Mould Bay anomaly in geomagnetic variations, 1963-66.
The application of an analytic procedure to determine Parkinson Induction vectors can supply information on the location and nature of the boundaries of the Mould Bay anomaly.

295. Freda, G.N., Geol. Surv. Can.:
Palaeomagnetism, Nipissingdiabase, Lake Panache, Ontario, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 217.
296. Hood, P.J., Bower, M.E. (Miss), Dicaire, A., Sawatzky, P., Knapp, H.W., Geol. Surv. Can.:
Aeromagnetic survey of Hudson Bay, Northwest Territories, 1965.
See Geol. Surv. Can., Paper 66-1, 1966, pp. 19-21 and Paper 67-1A, 1967, p. 206.
297. Hood, P.J., Sawatzky, P., Bower, M.E. (Miss), Geol. Surv. Can.:
Low-level aeromagnetic profiles over the Labrador Sea, Baffin Bay, and across the North Atlantic Ocean, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 129.
298. Horwood, J.L., Keys, J.D., Mines Branch, Dept. of Energy, Mines and Resources:
The magnetic susceptibility of (Zn, Fe)S solid solutions, 1964-67.
Objectives are to measure the magnetic susceptibility due to unpaired electron spins and to relate this information to the cohesive forces of Fe in (Zn, Fe)S.
299. Kornik, L.J., Geol. Surv. Can.:
Regional magnetic susceptibility survey in Manitoba and Saskatchewan, 1966-; Ph.D. thesis.
300. Larochelle, A., Geol. Surv. Can.:
Palaeomagnetic studies near Rouyn, Val d'Or and Sudbury.
See Geol. Surv. Can., Paper 66-1, 1966, p. 198.
Palaeomagnetism of Sudbury irruptive norite, Sudbury, Ontario, 1965-67.
A joint project with International Nickel Co. of Canada.
301. Lilley, F.E.M., Carmichael, C.M., Univ. of Western Ontario:
Attenuation of electric waves by magnetic fields, 1964-67; Ph.D. thesis (Lilley).
302. McGrath, P., Univ. of Manitoba:
Rock magnetism, 1964-67; Ph.D. thesis.
303. Niblett, E.R., Pecova, J., Anderson, F., Camfield, A., Dominion Observatory:
Magneto-telluric investigations near a vertical fault, 1965-68.
Magneto-telluric observations are in progress near a well known vertical fault in the Ottawa area. The data are being analyzed to see if the presence of a fault can have a clearly recognizable influence on the polarization of electric and magnetic vectors and on the observed apparent resistivity.

304. Norris, D.K., Larochelle, A., Geol. Surv. Can.:
Tectonic analysis, northern Cordillera, Northwest Territories and Yukon, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 45-46 and p. 218.
305. Palmer, C.H., Carmichael, C.M., Univ. of Western Ontario:
Palaeomagnetism, 1959-.
A major portion of 1965-66 was devoted to an intensive study of the remanent magnetism of some 230 samples of volcanic rock from 5 areas around Lake Superior.
306. Robertson, W.A., Dominion Observatory:
Palaeomagnetism of Manicouagan Lake, Quebec, 1964-67.
A study of the dacitic annulus of the ring feature; examination of its magnetic stability; comparison of the calculated pole with other Mesozoic pole positions.
307. Robertson, W.A., Roy, J.L., Dominion Observatory:
Stability of magnetism of Perry Formation, New Brunswick, 1965-67.
An investigation of the thermal stability of the Devonian formation.
308. Robertson, W.A., Roy, J.L., Park, J.K., Dominion Observatory:
Fisset Brook Formation (Devonian) Cape Breton, Nova Scotia, 1965-67.
An investigation of the pole position for the Devonian-Carboniferous boundary by study of volcanic and sedimentary rocks from Cape Breton.
Palaeomagnetism of Manicouagan Formation, Quebec, 1965-67.
Detailed study of stability of a mid-Carboniferous formation, to test the possibility of within-Carboniferous polar movement.
309. Roy, J.L., Irving, E., Dominion Observatory, Opdyke, N.D., Columbia Univ.:
Palaeomagnetism of the Bloomsbury Red Beds, 1964-66.
This study is to determine if the tectonic arc observed in the Valley and Ridge Province of the Appalachians is primary or owing to a bending in plan subsequent to the formation of the beds.
310. Roy, J.L., Robertson, W.A., Dominion Observatory:
Palaeomagnetism of the Hurley Creek Formation (Pennsylvanian) from New Brunswick, 1965-67.
For further check on the magnetic direction obtained from other Pennsylvanian formations.
Palaeomagnetism of the Dalhousie Beds, New Brunswick, 1965-67.
A study of the palaeomagnetic stability of Devonian lavas.

311. Roy, J.L., Robertson, W.A., Park, J.K., Dominion Observatory:
History of the Carboniferous palaeomagnetic pole from rocks
from the Maritimes of Canada, 1964-68.
Review of the magnetic field in North America in Carboniferous
time as displayed by palaeomagnetic results from formations in
the Maritime Provinces.
Palaeomagnetism of Shepody Formation, New Brunswick, 1964-67.
Thermal study of the magnetic spectrum in order to identify
the primary magnetic component, and from it to determine the
sense of the field and the position of the pole in mid-Carboniferous
time.
312. Schwarz, E.J., Geol. Surv. Can.:
Construction of a magnetic balance, 1965-66.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 27-28.
A ballistic magnetometer, 1966.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 24-26.
Dependence of magnetic properties on the thermal history of poly-
crystalline pyrrhotite, 1967-68.
Specimens are annealed at certain temperatures for up to
several days; magnetic properties before and after annealing are
compared.
313. Serson, P.H., Dawson, E., Clark, J.F., Haines, G.V., Dominion
Observatory:
Geomagnetism in the Hudson Bay region, 1964-66.
Presents the history of geomagnetic measurements in the
Hudson Bay region, the secular variation, large scale magnetic
features and their interpretation in terms of the magnetization of
rocks beneath the Bay, geomagnetic disturbance and conjugate
point phenomena. See Geomagnetism in the Hudson Bay region;
Chapter in Hudson Bay, ed. C.S. Beals (in press).
314. Spector, A., Univ. of Toronto:
Power spectral analysis of aeromagnetic data, 1965-.
It is proposed to use generalized Fourier techniques (power
spectrum analyses) to try to determine the depths of sources
contributing to aeromagnetic anomalies, and thus discover a
method of distinguishing among the many overlapping effects which
commonly occur in aeromagnetic maps.
315. Uffen, R.J., Univ. of Western Ontario:
Palaeobiophysics, 1962-66.
There is good evidence that reversals in the earth's magnetic
field have had an influence on the development of biological
species.

Radioactive

316. Carmichael, C.M., Killeen, P.G., Univ. of Western Ontario:
Gamma ray spectrometry of rocks in situ, 1964-68; M.Sc. thesis
(Killeen).
A portable gamma ray spectrometer was used to measure the
content of potassium, uranium and thorium over an area in the
Elliot Lake region, Ontario.
317. Doig, R., McGill Univ., Killeen, P.G., Gregory, A.F., Geol. Surv.
Can.:
Spectrometry of the natural gamma ray flux, and nuclear activa-
tion techniques, applied to the in situ analysis of geological
materials, 1962-.
318. Killeen, P.G., Geol. Surv. Can.:
Ground gamma ray spectrometer survey, 1966-67; Ph.D. thesis.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 148.

Seismic

319. Bancroft, A.M., Basham, P., Ellis, R.M., Whitham, K., Yole, R.,
Dominion Observatory, and Arctic Institute of North America:
Effect of site on seismograph recordings, and character of P-wave
signals, 1962-67.
A study of the influence of velocity structure under a station
on the character of the P-wave teleseismic signal. An exper-
iment involving station pairs of automatic seismographs in Alberta
has been concluded, and a digital file of forty teleseismic events
is being analyzed in both the frequency and time domain. The
results are unexpectedly complex. See A tape recording F.M.
seismograph; Pub. Dom. Obs., vol. 35, No. 4, 1966, and
Variations in spectra of P-waves recorded at Canadian Arctic
Seismograph Stations; Can. J. E. Sciences, 1966.
320. Barr, K.G., Berry, M.J., Dominion Observatory and Polar Continental
Shelf Project:
Crustal studies in Canadian Arctic, 1962-.
Refraction seismic profiles in the Arctic Archipelago with
special interest in anomalous features in the Western Arctic
Islands and the Continental margin. Attempts are being made to
relate the seismic refraction results to other geophysical results
in the same area. See Deep seismic refraction investigation in
the Canadian Arctic Archipelago; Geophysics, 30, p. 87, 1965.

321. Barr, K.G., Tyrlik, W.T., Kanasewich, E.R., Cumming, G.L., Piche, W., Berry, M.J., Dominion Observatory and Univ. of Alberta:
Crustal studies in Yellowknife area, Northwest Territories, 1966-68.
An experiment using 18 shot points and eleven observing crews was undertaken in 1966 to determine the sub-Moho velocity and time terms at points inside and outside the Slave Province, and to shoot a profile through Yellowknife at distances bracketing the cross over distance, across the Bear-Slave provincial boundary and across the McDonald fault.
322. Burke, K.B.S., Geol. Surv. Can. (part time):
Amplitude and frequency characteristics of seismic waves in the study of groundwater problems, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 120-121.
323. Burke, K.B.S., Finlayson, B.G., Univ. of Saskatchewan:
Study of the propagation of seismic waves in unconsolidated materials, 1966-67; M.Sc. thesis (Finlayson).
324. Dunn, D., Research Council of Alberta (part time):
Groundwater resources of the Stettler area, Alberta, 1965-67; Ph.D. thesis.
Analysis of the hydrological parameters of the Edmonton Formation in the Stettler area from pump-test data; mapping of the bedrock topography from water-well and seismic-shothole data; hydrology of a buried channel aquifer in the area.
325. Hajnal, Z., Univ. of Manitoba:
Crustal seismology, 1965-70.
326. Hobson, G.D., Geol. Surv. Can.:
Marine seismic investigations, Gulf of St. Lawrence, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 203-205.
Seismic reflection and refraction surveys, 1962-.
Seismic investigations, southern British Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 62.
Marine seismic survey, Lake Ontario, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 143-145.
327. Hobson, G.D., Hodge, R.A., Geol. Surv. Can.:
Seismic investigation near Flin Flon, Manitoba, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 125.

328. Hobson, G.D., Overton, A., Geol. Surv. Can.:
Seismic investigations of depth of overburden at Good Spirit Lake area, Saskatchewan, Kirkland Lake, Ontario, and Cape Breton Island, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 121-122, 158, 202-203, and Paper 66-2, 1966, pp. 10-14.
329. Leblanc, G., Université Laval:
Crustal studies using inverse filters and seismic recordings, 1964-.
This method uses crustal transfer functions as inverse filters on teleseismic recordings. All the analysis is done in the frequency domain using the Fourier transforms of all the elements influencing the recorded signal: source, distance, crust, etc. This method seems capable of choosing between probable crustal models suggested by other methods such as refraction profiles and surface wave dispersion.
330. Lennox, D.H., Carlson, V.A., Research Council of Alberta:
The seismic method in exploring for buried channels near Stavely, Alberta, 1958-67.
Extensive Research Council refraction seismic data in the Stavely area has been compared with subsequent geologic control in order to better establish the limitations of the method.
331. Manchee, E.B., Weichert, D., Whitham, K., Dominion Observatory:
Array seismology, 1962-.
The continuous processing of seismic signals recorded on a medium aperture crossed array of nineteen seismometers in order to study small magnitude events, criteria to distinguish explosion and earthquakes, and lateral and vertical upper mantle discontinuities. A primary purpose is to increase the signal-to-noise ratio in order to study propagation paths, the earthquake signal at the focus and crustal reverberation. See Digital experiments at twice real-time speed on the capabilities of the Yellowknife Seismic Array; Geophys. J.R.A.S., "Symposium on Geophysical Theory and Computers" Issue, 1966.
332. Mansinha, L., Univ. of Western Ontario:
Two dimensional seismic model, 1965-.
333. Mansinha, L., Mereu, R.F., Thapar, M.R., Univ. of Western Ontario:
Rayleigh wave dispersion by mountain roots, 1964-68; Ph.D. thesis (Thapar).

334. Mereu, R.F., Dubey, A.C., Univ. of Western Ontario:
Model seismology, 1963-66; M.Sc. thesis (Dubey).
335. Milne, W.G., Smith, W.E.T., Dominion Observatory:
Seismic regionalization of Canada - a continuing project.
Seismicity of Canada including epicentral and magnitude determinations, strain release maps, earthquake recurrence relations and extreme value theorem estimates of ground accelerations and intensities. In addition strong motion studies are being conducted on the west coast, and micro-earthquake studies pursued in the Arctic, British Columbia, and elsewhere. See Canadian earthquakes, 1963; Seism. Ser. Dom. Obs., 1963-64, 1966.
336. Murray, J.W., Tiffin, D.L., Univ. of British Columbia:
Continuous seismic profiling in the Strait of Georgia, British Columbia, 1965-67; M.Sc. thesis (Tiffin).
Involves a sparker survey in the Strait of Georgia, B.C. to determine the Quaternary sediment distribution, pre-Quaternary structure and the geologic history of this area.
337. Overton, A., MacAulay, H.A., Hodge, R.A., Parker, R.W., Geol. Surv. Can.:
Seismic studies, Elliot Lake, Ontario, 1966-.
To determine feasibility of using seismic techniques to determine thickness of strata overlying uranium pay-zone. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 155-157.
338. Schmidt, H., Univ. of Manitoba:
Effect of lithology of reflecting beds on amplitudes of reflections in seismic prospecting for oil, 1966-67; M.Sc. thesis.
339. West, G.F., Halls, H., Univ. of Toronto:
Structure of the Keweenaw Basin and the earth's crust in the vicinity of Lake Superior, 1963-67; Ph.D. thesis (Halls).
The results of the 1963 Lake Superior Seismic experiment showed that the crust of the earth is abnormally thick under the eastern part of Lake Superior, and that the late Keweenaw sedimentary basin (in which the lake lies) is much deeper than was expected. Much additional geophysical data is now available and a much improved picture of the structure of the region should be obtained. Combined geological and geophysical studies are being undertaken to this end.

340. White, W.R.H., Bone, M.N., Dominion Observatory:
Crustal studies in the Cordillera, British Columbia and Alberta -
a continuing project.
A program of seismic refraction studies to outline the major
crustal and upper mantle features of the Cordilleran region.
Observations parallel to the West Coast have been published, and
a reversed profile from Merrit to Quesnel completed. An unre-
versed profile from Merrit to Quesnel completed. An unreversed
profile from Revelstoke to Vancouver Island was conducted in
1966. See A seismic refraction and gravity study of the earth's
crust in British Columbia; Bull. Seism. Soc. Am., 55, p. 463,
1965.
341. Wickens, A.J., Pec, K., Dominion Observatory:
Surface wave studies, 1962-.
A study of mean crustal and upper mantle structure for all
major geological units in Canada using the seismic network of
long period instruments. See Theoretical dispersion tables for
Love Waves propagating in a wedge and in a single non-
homogeneous layer with a linear velocity gradient; Pub. Dom.
Obs., vol. 35, No. 1, 1966.
342. Wickens, A.J., Stevens, A.E., Hodgson, J.H., Dominion
Observatory:
Earthquake mechanisms from P and S waves - a continuing
project.
A practical method has been developed whereby shear wave
polarization angles can be used to select the point source model
best representing the focal mechanism of a large earthquake.
Twenty-seven of the 28 earthquakes studied to date are the double
dipole type; one is the single couple type. See S-wave focal mech-
anism studies of the Hindu Kush earthquake of July 6, 1962; by
A.E. Stevens, Can. J. Earth Sciences, vol. 3, p. 367, 1966.

General Problems

343. Bhattacharyya, B.K., Langlois, R., Geol. Surv. Can.:
Treatment of non-equispaced data, 1966-67.
344. Brisbin, W.C., Univ. of Manitoba, and Turek, A.C., Haugh, I.,
Scoates, R.F.J., Manitoba Mines Branch:
Development of computer treatment methods for field observa-
tions and programming for their retrieval, decoding and
plotting (Project Pioneer).

345. Brown, R.J., Univ. of Manitoba:
Variation of frequency spectrum with distance, on University of
Manitoba recordings from the 1965 Hudson Bay experiment,
1966-67; M.Sc. thesis.
346. Burke, K.B.S., Wyder, J.E., Univ. of Saskatchewan:
Application of geophysical methods to problems of groundwater
location in the Canadian prairies, 1963-67; Ph.D. thesis
(Wyder).
Evaluation of the application of conventional surface
geophysical techniques to specific geohydrological problems in
southeastern Saskatchewan.
347. Buist, Fr., Brebeuf College, Geldart, L., Saull, V., Telford, R.M.,
McGill Univ., Leblanc, Fr., Laval Univ.,
Earthquake prediction in the St. Lawrence lowland of Quebec,
1965-.
The purpose is to study the relation of recent earthquakes to
geological conditions, and establish a system of instrumental
prediction of earthquakes.
348. Gross, H., Geol. Surv. Can.:
Uniplanar susceptibility meter, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 145-146.
349. Gurbuz, M.B., Univ. of Manitoba:
Velocity variation in crust and upper mantle and body-wave
attenuation in crust for Univ. of Manitoba crustal soundings
and data from Project Early Rise in Manitoba and Ontario,
1966-69; Ph.D. thesis.
350. Hood, P.J., Gross, H., Camfield, A., Geol. Surv. Can.:
New in situ susceptibility meter, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 145-146.
351. Koulomzine, T. and graduate students, Ecole Polytechnique,
Université de Montréal:
Systematic study of the geophysical properties of the unconsol-
idated rocks of the St. Lawrence Lowlands, 1966-68.
352. Koulomzine, T., Lavoie, C., Ecole Polytechnique, Université de
Montréal:
Comparative study of electrical and electromagnetic methods as
applied to the search for sulphide deposits, 1966-67; M.Sc.
thesis (Lavoie).
A pyrite body covered by 70-100 feet of particularly wet clay
overburden topped by a swamp will be studied to determine which

geophysical method will give positive indications of the pyrite body in spite of particularly difficult conditions.

353. Mansinha, L., Smylie, D.E., Univ. of Western Ontario:
Effect of earthquakes on the earth's wobble and secular polar shift, 1966-.
354. McDougall, D.J., Loyola College:
Thermoluminescence of rocks, 1962-.
See a study of the distribution of thermoluminescence around an ore deposit; Economic Geology, Oct. 1966.
355. Mereu, R.F., Hunter, J.A.M., Univ. of Western Ontario:
Crustal sounding, 1965-67; M.Sc. thesis (Hunter).
356. Morley, L.W., Geol. Surv. Can.:
Infrared scanning survey, 1966.
357. Saull, V., Telford, R.M., McGill Univ.:
Geophysical measurements in the St. Lawrence Lowland of Quebec, 1966-67.
Project includes field measurement of thermal gradients in boreholes, also gravity and magnetic measurements.
358. Smylie, D.E., Beck, A.E., Univ. of Western Ontario:
Hydrodynamics of the earth's core, 1964-.
Experimental use of high electric field gradients in a dielectric fluid to produce thermal convection under a central force.
359. Wilson, H.D.B., Brisbin, W.C., Hall, D.H., Hajnal, Z., McGrath, P., Univ. of Manitoba:
Nature of the Canadian Shield in Manitoba and northwestern Ontario, 1960-; Ph.D. thesis (McGrath).
A joint project, regional geology and gravity, Wilson and Brisbin; magnetic, Hall and McGrath; seismic, Hall and Hajnal and Brisbin; age dating, G.S. Clark.

GEOMORPHOLOGY AND GLACIOLOGY

360. Buchwald, C.E., McMaster Univ.:
Study of the shoreline processes of Lake Erie, 1966-.
Long Point, on the north shore of Lake Erie, is a prominent spit about 25 miles long and from one to five miles wide. Largely untouched by man-made projects, the spit is a natural laboratory for the investigation of shoreline processes. Research is being

undertaken on the nourishment and erosion of the beach and the distribution of sediments in the foreshore, shore, beach and dune areas.

361. Clissold, R.J., Univ. of Alberta:
A quantitative study of Alpine landforms, Canadian Rocky Mountains near Jasper, Alberta, 1965-67; M.Sc. thesis.
362. David, P.P., Université de Montréal:
Study of selected sand dune areas in Canada, 1965-68.
363. Elson, J.A., Thomas, R.D., Gwyn, H.Q., McGill Univ.:
A quantitative study of denudation processes, 1966-; M.Sc. theses (Thomas and Gwyn).
A long term program of observation of slope processes on Mount St. Hilaire, Quebec, is being established, and a number of short term studies (1 or 2 years) are being done to evaluate the rate of denudation and the role of various processes in the transport of materials. Minor facets of the denudation problem are being examined elsewhere, and include the lowering of limestone surfaces and the role of needle ice in soil creep.
364. Fyles, J.G., St. Onge, D.A., Geol. Surv. Can.:
Study of eskers in the western Canadian Shield, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 25.
365. Green, R., Research Council of Alberta, Westgate, J.A., Tokarsky, O., Univ. of Alberta:
The preglacial Peace Valley and its deposits around the town of Peace River, Alberta, 1966-68; M.Sc. thesis (Tokarsky).
366. Gwyn, H.Q., McGill Univ.:
Slope movements resulting from freeze-thaw and wetting-drying cycles, 1966-68; M.Sc. thesis.
Soils on well drained to poorly drained slopes with northern and southern exposures are being instrumented to record movements, temperature and moisture changes.
367. Hattersley-Smith, G., Defence Research Board:
Geophysical research in the high Arctic, 1963-.
This project covers glaciological, meteorological and oceanographic studies in northwestern Ellesmere Island. Under this project the Defence Research Board has also supported scientists engaged in glacier mapping and glacier depth-sounding. See Reconnaissance oceanography over the ice of the Nansen Sound fiord system; Defence Research Board, Report D Phys R (G) Hazen 28, 18 p.

368. Klassen, R.W., Geol. Surv. Can.:
Surficial geology and geomorphology, Assiniboine Valley,
Saskatchewan and Manitoba, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 125-126.
369. Mathews, W.H., Univ. of British Columbia:
Glaciological studies, Granduc area, British Columbia, 1965-.
Project involves mass budget studies of the Granduc Glaciers
in connection with prediction of shifts in the ice margins near
points of interest in mining developments; and investigations of
the catastrophic discharge of Summit Lake under Salmon Glacier
into Salmon River, the discharge pattern, mode of enlargement
of the subglacial escape route, the triggering and closing mech-
anisms. In addition geothermal studies in a tunnel being driven
under one of the glaciers are being started.
370. Mathews, W.H., Mackay, J.R., Univ. of British Columbia:
Snow Creep studies, Mount Seymour, British Columbia, 1958-68.
Project involves continuing studies of pressures exerted by
creeping snow, Mount Seymour, and temperature effects on snow
pack caused, among other things by heat-flow from underlying
bedrock.
371. St. Onge, D.A., Geol. Surv. Can.:
Quaternary geology and geomorphology, Whitecourt map-area,
Alberta, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 115-117.
372. Thomas, R.D., McGill Univ.:
The rate of lowering of Mount St. Hilaire, with special reference
to the role of trees in the movement of slope materials,
1966-68; M.Sc. thesis.
A preliminary estimate of the rate of lowering of the area as
a result of chemical weathering and slope process is being made,
and the role of trees in obstructing movement of material on
slopes and in accelerating the movement of material when
uprooting by blowdown occurs, is being investigated.
373. Tiphane, M., Quebec Dept. of Natural Resources (part time), Univ.
of Montreal:
Sand and gravel beaches on the Gaspesian coast, Quebec, 1966-67.
Study of the behaviour of beach material to find out the effects,
if any, of the exploitation of sand and gravel pits on neighbouring
areas.

374. Weber, J.R., Dominion Observatory:
Penny Ice Cape survey, 1962-.

The relative position of 14 aluminum poles across the crest of the ice cap were resurveyed, the gravity differences between the poles and "Gravity Base" were remeasured, and the gravity change along the direction of the movement of the centre pole was observed. Stratigraphic snow analysis, density and temperature measurements were carried out at the centre station, elevation 1,838 m a.m.s.l. The 15 stakes across the outlet glacier were recovered and movement and ablation measured.

MINERAL DEPOSITS

Base Metals

375. Ambrose, J.W., Brown, A., Queen's Univ.:
Geology of Opemiska mine, Quebec, 1961-67; Ph.D. thesis (Brown).
A study of the detailed structure of the Opemiska mine area including various statistical approaches to the study of small folds and other minor structures.
376. Bachinski, D., Whitmore, D.R.E., Geol. Surv. Can.:
Studies of sulphide deposits, Whalesback Mine area, Newfoundland.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 177.
377. Baldwin, A.B., Gross, W.H., Univ. of Toronto:
The cause for localization of surface iron ores on a Precambrian iron formation, 1959-66; Ph.D. thesis (Baldwin).
See Remnant magnetism and the origin of hard hematites in Precambrian banded iron formation; Econ. Geol., vol. 56, p. 1,345, 1961.
378. Béland, J., Gentile, F., Université de Montréal:
Structural and stratigraphic study of the Lemieux Dome, Gaspé, Québec, 1965-67; M.Sc. thesis (Gentile).
A study of the origin of this dome and the copper mineralized brecciae it contains.
379. Bingley, J., Shea, F.S., Nova Scotia Dept. of Mines:
Investigations for base metal deposits in Gabarus, Cape Breton county, Nova Scotia, 1964-67.
The work in 1966 included more detailed geochemical surveys and diamond drilling to test the anomalous zones indicated by earlier geochemical and geophysical surveys.

380. Blais, R.A., Descarreaux, J., Grenier, J., Ecole Polytechnique, Université de Montréal:
Geology of new sulphide deposits in Quebec, 1964-66; M.Sc. theses (Descarreaux and Grenier).
A study is also underway on the mineralogy, structure and wall-rock alteration of Mine de Poirier, Joutel township.
381. Blais, R.A., Machairas, G., Ecole Polytechnique, Université de Montréal:
Volcanogenic environment of zinc-copper orebodies in the Noranda area, 1964-.
Includes a detailed investigation of Lake Dufault Mine and geochemical investigations on the volcanics of the Noranda area.
382. Blecha, M., McGill Univ.:
Origin of mineralized breccias in Batachewana area, Ontario, 1964-68; Ph.D. thesis.
383. Cabri, L.J., Mines Branch, Dept. of Energy, Mines and Resources:
Sulphide synthesis, 1964-.
Sulphide minerals of closely controlled compositions are synthesized to provide material for other investigations, and to provide fundamental data on phase equilibrium relationships in certain sulphide systems. A series of low-iron sphalerites were successfully synthesized for other investigations and at present high-iron sphalerites are being synthesized.
Phase equilibrium studies in the Cu-Fe-S and related systems, 1965-.
To closely determine equilibrium relations, stability fields and conditions for metastable relations in sulphide systems, and thereby further our knowledge of sulphide ore deposits.
384. Carter, N.C., British Columbia Dept. of Mines and Petroleum Resources:
Copper mineralization in the Babine Lake area, British Columbia, 1965-; Ph.D. thesis, Univ. of British Columbia.
See Annual report, British Columbia Department of Mines 1965, Lode Metals Section, pp. 90-102.
385. Chamberlain, J.A., Geol. Surv. Can.:
Geology of Canadian nickel deposits, 1963-.
See Geol. Surv. Can., Paper 66-1, 1966, p. 186 and 67-1A, 1967, p. 216.
386. Clark, L.A., McGill Univ.:
Study of sulfide ores associated with Tertiary and Recent volcanics in Japan, 1966-67.

387. de Römer, H., Quebec Dept. of Natural Resources:
Lake Madeleine area, Lesseps and Deville townships, Gaspé-
North county, Quebec; 1,000 feet to 1 inch, 1963-.
The continuation of a program of detailed mapping in the
central part of the Gaspé Peninsula where an Ordovician-Devonian
assemblage of rocks surrounding the Table Top Mountains carries
base metal mineralization.
388. Dastidar, P.G., Univ. of New Brunswick:
Mineralogical study of some Appalachian ore deposits, 1964-67;
Ph.D. thesis.
Determination of the major and trace element distributions
within oxide and sulphide phases of five ore deposits.
389. Eckstrand, N.L., McGill Univ.:
Deformation of pentlandite and pyrrhotite, 1966-67; M.Sc. thesis.
390. Faye, G.H., Mines Branch, Dept. of Energy, Mines and Resources:
Chemical reaction at surfaces of base metal sulphide minerals,
1964-.
Currently the reaction of chelating agents such as 2 - 2
biquinoline and substituted phenanthrolines with the iron and
copper in chalcopyrite, and substituted phenanthrolines with iron
in iron bearing zinc sulphides, is being investigated.
391. Fleming, J.M., Papezik, V., Memorial Univ. of Newfoundland:
Petrology of the Whalesback mine near Springdale, Newfoundland,
1964-67; M.Sc. thesis (Fleming).
Detailed petrology of Ordovician volcanic rocks, the host-
rocks of copper mineralization in the Whalesback mine.
392. Fyles, J.T., British Columbia Dept. of Mines and Petroleum
Resources:
Jordan River area, British Columbia, 1964-67.
Study of structure and lead-zinc mineralization in rocks of
the Shuswap metamorphic complex. Part of the Cordilleran
Structure Project.
393. Girard, P., McGill Univ.:
The Petit Mont St. Anne copper deposit in Gaspé, Quebec,
1966-68; Ph.D. thesis.
394. Hutchinson, R.W., Fleet, M.E., McRae, N., Univ. of Western
Ontario:
Electron probe investigation of Cu-Zn massive sulphide ores,
1967-.

Certain chemical and mineralogical changes apparently take place during thermal and/or regional metamorphism of these ores. The investigation is directed at investigation of these changes.

395. Hutchinson, R.W., Graham, R.F., Harron, G.A., Bertrand, C., Kacira, N., McMillan, R., Univ. of Western Ontario: Genesis of Canadian Cu-Zn massive sulphide deposits, 1964-; Ph.D. theses (Kacira, Bertrand), M.Sc. theses (Graham, Harron, McMillan).
Origin of these ores is being investigated from the multiple standpoints of their primary syn-volcanic origin their diagenetic history and their still later metamorphic history. See Genesis of Canadian Massive Sulphides Reconsidered by Comparison to Cyprus Deposits, CIMM Bull., No. 641, Sept., 1965, pp. 972-986.
396. Juhas, A.P., Univ. of Manitoba:
Origin of copper-nickel orebodies associated with the Bird River Sill, 1965-69; Ph.D. thesis.
An overall study of sulphide deposits in the Bird River Sill.
397. Kelley, R., Quebec Dept. of Natural Resources:
Study of copper-zinc deposits in Joutel and Poirier townships, Abitibi-East county, Quebec, 1964-66; Ph.D. thesis.
398. Kelly, R., Université Laval:
A study of the copper and zinc deposits of Joutel and Poirier townships, Abitibi, Quebec, 1964-68; D.Sc. thesis.
399. Kindle, E.D., Geol. Surv. Can.:
Studies of copper deposits, Yukon Territory and northern British Columbia.
See Geol. Surv. Can., Paper 66-1, 1966, p. 62 and Paper 66-2, 1966, p. 43.
400. Kish, L., Quebec Dept. of Natural Resources:
West Half of Blondeau township, Temiscamingue area, Quebec; 1,000 feet to 1 inch, 1964-67.
The area is in the vicinity of the nickel-copper deposit being exploited by Lorraine Mining Co. Ltd.
401. Koulomzine, T., Lavoie, C., Ecole Polytechnique, Université de Montréal:
Comparative study of electrical and electromagnetic methods as applied to the search for sulphide deposits, 1966-67; M.Sc. thesis (Lavoie).

A pyrite body covered by 70-100 feet of particularly wet clay overburden topped by a swamp will be studied to determine which geophysical method will give positive indications of the pyrite body in spite of particularly difficult conditions.

402. Lusk, J., McMaster Univ.:
Distribution of zinc, copper, lead and silver in the Heath Steele B-1 sulfide deposit, New Brunswick and an investigation of its sulfur isotopes, 1963-67; Ph.D. thesis.
A detailed study has been made of the distribution of zinc, copper, lead and silver. A sulfur isotope study is continuing on coexisting sulfide minerals from mineralogically distinct ore-bands; across orebody variations in total sulfur ratios are also being investigated. Limited experimental work is planned in an attempt to elucidate some of the findings made so far.
403. McCartney, W.D., Vasquez, J., Queen's Univ.:
Fluid inclusion and some trace element variation in a Pine Point orebody, 1966-67; M.Sc. thesis (Vasquez).
404. Neilson, J.M., Rodriquez, S.E., Queen's Univ.:
Carupano lead-zinc deposits, Estado Sucre, Venezuela, 1966-67; M.Sc. thesis (Rodriquez).
405. Sangameshwar, S.R., Univ. of Saskatchewan:
Mineralogy of a copper-bearing sulphide deposit, 1966-67; M.Sc. thesis.
The study will involve the distribution and manner of occurrence of cobalt and nickel in the sulphide minerals.
406. Sangster, D.F., Geol. Surv. Can.:
Geochemistry of lead-zinc deposits in carbonate rocks, 1965-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 212-213.
407. Sasaki, A., Fritz, P., Folinsbee, R.E., Krouse, R., Cumming, G.L., Jackson, S., Singh, R., Univ. of Alberta:
Isotope studies, Pine Point, Northwest Territories - a continuing project.
Sulphur, oxygen and lead isotope studies of Pine Point with a view to establishing genesis of the deposit. See Sulphur isotope and the Pine Point lead-zinc deposits, Northwest Territories; Geol. Soc. America Annual Meeting, San Francisco, 1966 (Abstract).

408. Sauvé, P., Université Laval:
Petrology of a gabbro sill containing copper-nickel sulphide deposits near Gerido Lake, New Quebec, 1966-68.
A study of the Solbec and Cupra copper-zinc deposits, Quebec, 1966-69.
409. Scott, S. (Miss), McGill Univ.:
Trace element study, Temagami mine ore, 1966-67; M.Sc. thesis.
410. Sims, W.A., Quebec Dept. of Natural Resources (part time), Mt. Allison Univ.:
Study of heavy mineral distribution in the vicinity of the Gaspé Copper and Federal Metals Corp. mining camps, Holland and Lemieux townships, Gaspé-North county, Quebec, 1964-67.
411. Sims, W.A., McGill Univ.:
Heavy minerals as potential indications of sulphide deposits, Gaspé area, Quebec, 1963-67; Ph.D. thesis.
412. Stevenson, J.S., McGill Univ.:
Comprehensive petrological and mineralogical study of the Sudbury Basin Irruptive, Ontario, 1951-.
See Sudbury in terms of Upper-Mantle Petrology; Proceedings of the Geol. Soc. Amer., 1965, p. 18.
413. Suffel, G.G., Univ. of Western Ontario:
Comparison of structures and textures in sulphide ores with those of metamorphic rocks, 1966-68.
414. Suffel, G.G., Mookherjee, A., Univ. of Western Ontario:
Relationship of dikes to Canadian massive sulphide ores, 1966-69.
415. Wilson, H.D.B., Univ. of Manitoba:
Nickel deposits related to ultramafic intrusions, 1963-.
See Nickel Sulphide Ores Related to Ultrabasic Intrusions in Canada, Soc. Econ. Geol. Symposium on Magmatic Ore Deposits (in press).

Ferrous Metals

416. Blais, R.A., Ecole Polytechnique, Université de Montréal:
Geology of Baffinland iron deposits, Northwest Territories, 1964-67.
A paper on the deposits will be published in 1967 in the bulletin of the Canadian Institute of Mining and Metallurgy.

417. Gross, G.A., Geol. Surv. Can.:
Iron deposits of Canada, 1957-.
To provide information on the size, composition, mode of occurrence, origin, potentialities, and other geological features of the main known iron deposits of Canada. See Geol. Surv. Can., Bull. 82, 1963 and Paper 66-2, 1966, pp. 39-43.
418. Wilton, P., Univ. of Manitoba:
Iron deposits of the Temagami Region, Ontario, 1963-68; Ph.D. thesis.
419. Zajac, I.S., Geol. Surv. Can., (part time):
Stratigraphy of Superior-type iron formation in the Schefferville-Knob Lake area, Quebec and Labrador; Ph.D. thesis, Univ. of Michigan.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 214-215.

Radioactive Deposits

420. Hutchinson, R.W., Univ. of Western Ontario:
Origin of a uranium deposit in the Colorado Front Ranges, 1965-.
421. Killeen, P.G., Geol. Surv. Can.:
Ground gamma-ray spectrometer survey, 1966-67; Ph.D. thesis.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 148.
422. Macdonald, J.A., McGill Univ.:
Surface migration of uranium, Beaverlodge, Saskatchewan, 1966-67; Ph.D. thesis.
423. Martindale, R.D., McMaster Univ.:
Study of the uranium rich quartz conglomerates of the Elliot Lake area, Ontario; 1966-68; M.Sc. thesis.
Work will concentrate on the ore microscopy of the sulfide fraction and the previous metal geochemistry of the ores. In particular, determinations of gold and palladium will be carried out on a limited suite of pyrite concentrates from the Rio Algom Nordic and Denison mines.
424. Neilson, J.M., Beechman, A.W., Queen's Univ.:
Structural control of pitchblende mineralization, Beaverlodge, Saskatchewan, 1966-67; M.Sc. thesis (Beecham).
425. Overton, A., MacAulay, H.A., Hodge, R.A., Parker, R.W., Geol. Surv. Can.:
Seismic studies, Elliot Lake, Ontario, 1966-.

To determine feasibility of using seismic techniques to determine thickness of strata overlying uranium pay-zone. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 155-157.

Other Metals

426. Armstrong, C.W., Hutchinson, R.W., Edgar, A.D., Univ. of Western Ontario:
Comparative studies of lithium-bearing pegmatites, 1965-68;
Ph.D. thesis (Armstrong).
A study of the mineralogy, chemistry and field relationships of zoned lithium pegmatites with particular reference to the pegmatites with particular reference to the pegmatites from Vald'Or, Quebec.
427. Azzaria, L.M., McGill Univ.:
The mode of occurrence of mercury in soils from the vicinity of ore deposits, 1966-68.
428. Bailes, A.H., Univ. of Manitoba:
Geology and geochemistry of the Gold Lake property, Rice Lake area, Manitoba, 1966-67; M.Sc. thesis.
429. Boyle, R.W., Laverigne, P.J., Mihailov, G., Durham, C.C., Geol. Surv. Can.:
Appraisal of geochemical methods as a means of locating silver deposits, Cobalt, Ontario, 1966.
See Geol. Surv. Can., Papers 66-46, 1966 and 67-1A, 1967, pp. 132-133.
430. Eastwood, G.E.P., British Columbia Dept. of Mines and Petroleum Resources:
Molybdenite on Red Mountain, Rossland, British Columbia, 1966-67.
431. Ferguson, S.A., Ontario Dept. of Mines:
Four gold mines in northern Ontario (Macleod Cockshutt, Consolidated Mosher, Renabie and Nudulama Mines Ltd.), 1966.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 20-23.
432. Jolliffe, A.W., Riley, R., Queen's Univ.:
Bauxite of Archaean age, Steep Rock Lake, Ontario, 1964-67;
M.Sc. thesis (Riley).

See Stratigraphy of the Steeprock Group, Steep Rock Lake, Ontario; Geol. Assoc. of Canada, Special Paper No. 3, June 1966.

433. Keays, R.R., McMaster Univ.:
Study of the geochemistry of the metals palladium, platinum, iridium and gold in the minerals of the Sudbury camp, Ontario, 1962-67; Ph.D. thesis.
A method for the simultaneous determination of the metals by neutron activation analysis has been developed and is being employed to study coexisting sulphide minerals from the Sudbury camp.
434. McDonald, B.C., Geol. Surv. Can.:
Auriferous till in the Eastern Townships, southeastern Quebec, 1965-66.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 51-54.
435. Mulligan, R., Geol. Surv. Can.:
Tin deposits in Canada, 1961-.
To study and compile the geology of tin deposits and occurrences to help mineral exploration.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 206-208.
Metallogenic study of beryllium-tin province of Cassiar batholith, northern British Columbia and Yukon, 1965-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 206-207.
436. Petruk, W., Mines Branch, Dept. of Energy, Mines and Resources:
Mineralogy of the silver deposits in the Cobalt and Gowganda areas, Ontario, 1964-67.
A systematic study is being made of the deposits in the Cobalt and Gowganda areas in order to obtain detailed information on their mineralogical and chemical characteristics. It is hoped that this will lead to a better understanding of ore deposition processes and will serve as a useful aid in exploration and ore utilization.
437. Prochnau, J.F., McGill Univ.:
Gold distribution in the Chibougamau district, Quebec, 1966-67; M.Sc. thesis.
438. Rose, E.R., Geol. Surv. Can.:
Geology of vanadium deposits of Canada, 1963-.
See Geol. Surv. Can., Paper 66-1, 1966, p. 204.

439. van de Poll, H.W., New Brunswick Dept. of Natural Resources:
Geology of the Mount Pleasant area, Charlotte and Sunbury
counties, New Brunswick, 1962-67.

The study was initiated to determine the age of rocks enclosing the Mount Pleasant tin occurrence, to gain a better understanding of the origin and mode of emplacement of the acidic volcanic rocks, distributions of host rock alteration and to delineate areas of economic interest and understand the structural control.

Industrial Minerals

440. Bannatyne, B.B., Manitoba Mines Branch:
Clay and shale in Manitoba, 1961-67.
Isopach and structure contour maps, Cretaceous formations, Manitoba; Bedrock topography map, southern Manitoba.
441. Bérard, J., Ecole Polytechnique, Université de Montréal:
Pétrographie des agrégats et des bétons a ciment Portland, 1965-.
442. Dean, R.S., Mines Branch, Dept. of Energy, Mines and Resources:
Mineralogy of argillaceous materials in Canada, 1958-.
See The Composition and Properties of Ceramic Clays and Shales of Ontario, Jour. Can. Cer. Soc. (vol. 34), (1965).
443. DeLancey, P., Univ. of Manitoba:
Geology of the Tarefare Fluorite deposit, Newfoundland, 1966-67;
M.Sc. thesis.
444. Dreimanis, A., Gunn, C.B., Univ. of Western Ontario:
Provenance of diamonds in glacial drift, Great Lakes region,
1964-67; M.Sc. thesis (Gunn).
445. Fowler, J., Shea, F.S., Nova Scotia Dept. of Mines:
Clay and shale deposits in Cumberland county, Nova Scotia, 1966.
The first phase of a continuing program to assess the potential for the manufacture of clay products in the Province.
446. Guillet, G.R., Ontario Dept. of Mines:
Industrial mineral studies, 1966.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 59-60.
447. Harris, I., Fleming, J., Butler, J., Bartlett, G., Newfoundland
Dept. of Mines, Agriculture and Resources:
Silica assessment project, 1965-68.

Involves geological mapping, diamond drilling and quantitative analysis for SiO_2 , Fe_2O_3 , Al_2O_3 , MgO , CaO , Na_2O , K_2O .

448. Hewitt, D.F., Ontario Dept. of Mines:
Industrial mineral resources, Brampton area, Ontario, 1966.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 57-58.
449. Holter, M., Wardlaw, N.C., Univ. of Saskatchewan:
Middle Devonian potash beds in Saskatchewan, 1965-67; M.Sc. thesis (Holter).
A regional study of the Middle Devonian potash beds in southern Saskatchewan. The objective is to correlate beds on a regional basis, define major mineralogical changes, and define major sub-basins.
450. Hutchinson, R.W., Univ. of Western Ontario:
Genetic processes in formation of sylvite-rich evaporite deposits, 1965-67.
A sylvite deposit in the Danakil area of Ethiopia provides the basis for a comparative and evaluative study of the genetic processes involved. These processes have undoubtedly been important in other, older evaporite sequences.
451. MacNeill, R.H., Acadia Univ. and Nova Scotia Research Foundation:
Petrographic study of aggregate materials, 1966-68.
452. Maurice, O.D., Sirois, R., Quebec Dept. of Natural Resources:
Industrial minerals investigations.
A continuing program of investigation, with the purpose of advising owners as to the value of industrial mineral deposits and furnishing information regarding the developing, mining, milling and marketing of their product.
453. McIntosh, R.A., Wardlaw, N.C., Univ. of Saskatchewan:
"Salt Horses" in the International Minerals Mines, Esterhazy, Saskatchewan, 1965-67; M.Sc. thesis.
A geochemical, petrographic and structural study of localized halite masses occurring in potash ore beds.
454. Murray, D.A., Nova Scotia Dept. of Mines:
Investigation of limestone and dolomite deposits, mainland of Nova Scotia, 1966-71.
All deposits are being studied and potential economic deposits will be tested in a preliminary manner by diamond drilling.

455. Russell, G. A., Univ. of Manitoba:
An investigation of iron contamination in the Black Island silica sand deposit, Manitoba.
456. Soles, J. A., Mines Branch, Dept. of Energy, Mines and Resources:
Mineralogy and petrography of construction materials and their response to environmental conditions, 1957-.
See Effect of Elevated Temperatures on Two Anorthositic Rocks, Mines Branch Investigation Report IR 65-39 (1965).
457. Stauffer, M. R., Wardlaw, N. C., Hoque, M., Univ. of Saskatchewan:
Structural geology of the gypsum deposit near Gypsumville, Manitoba, 1966-67; M.Sc. thesis (Hoque).
458. Streeton, D. W., Wardlaw, N. C., Univ. of Saskatchewan:
Devonian Prairie Evaporite Formation in the Yorkton area, Saskatchewan, 1966-67; M.Sc. thesis (Streeton).
Bromine and rubidium distribution in minerals of the potash ore beds is being investigated, and in combination with petrographic data provides evidence for the relationship between various salt minerals. The area includes a large solution channel and the effects of solutioning on adjacent and associated beds can be examined. Also, the area is situated at the basin margin and the wedging out of the salt formation can be studied with a view to establishing whether this is a depositional edge, or one caused by subsequent erosion.
459. Tiphane, M., Quebec Dept. of Natural Resources (part time), Univ. of Montreal:
Sand and gravel beaches on the Gaspesian coast, Quebec, 1966-67.
Study of the behaviour of beach material to find out the effects, if any, of the exploitation of sand and gravel pits on neighbouring areas.
460. Wardlaw, N. C., Univ. of Saskatchewan:
Carnallite-sylvite relationships in the Watrous area, Saskatchewan, 1965-67.
The mineralogy of potash ore beds locally changes abruptly from a sylvite (KCl) - halite (NaCl) to a carnallite ($\text{KClMgCl}_2 \cdot 6\text{H}_2\text{O}$) - halite assemblage. Carnallite masses are apparently irregular in size and shape. Three possibilities exist for the relationship between carnallite and sylvite: (1) they are facies equivalents - the products of simultaneous deposition in different portions of the salt basin, (2) carnallite formed by the action of magnesium chloride from carnallite, (3) sylvite formed by the leaching of magnesium chloride from carnallite. The elements rubidium and

bromine, in solid solution in sylvite and carnallite, provide a unique way of distinguishing between these possibilities. Trace element data, combined with stratigraphic and mineralogical evidence, suggests that the sylvite of the uppermost zones in the Watrous-Kandahar area has formed from carnallite. See Halite-Anhydrite seasonal layers in the Middle Devonian Prairie Evaporite Formation, Saskatchewan, Canada; Bull. Geol. Soc. Amer., vol. 77, pp. 331-342, 1966.

461. Wardlaw, N.C., Stauffer, M.R., Hoque, M., Univ. of Saskatchewan: Gypsum deposits of Gypsumville, Manitoba, 1965-67; M.Sc. thesis (Hoque).
- The gypsum beds are complexly contorted by several generations of folds. Work to date suggests that folding may be the product of glacial thrusting rather than due to expansion of anhydrite in hydrating to gypsum. The age of this deposit is unknown and it is hoped that microfossils may be retrieved from shales associated with the gypsum, and an age established.

Petroleum

462. Cartier, G., Univ. of Alberta:
The Bellshill Lake Oilfield (Lower Cretaceous) east-central Alberta, 1966-67; M.Sc. thesis.
463. Charbonnier, R.P., Draper, R.G., Mines Branch, Dept. of Energy, Mines and Resources:
Directory of Canadian oil reservoirs, 1964-.
- This Directory will contain detailed analyses of numerous Canadian oil samples, and geological, reservoir and secondary recovery data on selected oil pools from which these samples were taken.
464. Currie, L.J., McGill Univ.:
Evaluation of petroleum potential of the Trenton Group, 1966-68; M.Sc. thesis.
465. Draper, R.G., Millson, M.F., Montgomery, D.S., Mines Branch, Dept. of Energy, Mines and Resources:
Study of Melville Island Bituminous Sand, 1965-66.
- Elemental analysis and sulphur isotope ratios were done as well as determination of bitumen gravity and content.

466. Draper, R.G., Montgomery, D.S., Wanless, R.K., Mines Branch,
Dept. of Energy, Mines and Resources:
Variation of the sulphur isotope ratio of the bituminous sand from
the McMurray Formation as a function of the oxygen content
of the bitumen, 1967.
467. Howie, R.D., Geol. Surv. Can.:
Subsurface and regional studies in Eastern Canada as related to oil
and gas, 1960-.
468. Montgomery, D.S., Millson, M.F., Mines Branch, Dept. of Energy,
Mines and Resources:
Infra-red absorption spectra of bituminous substances, 1951-.
Involves a continuing program to improve the methods of
classifying bituminous substances.
469. Schmidt, H., Univ. of Manitoba:
Effect of lithology of reflecting beds on amplitudes of reflections
in seismic prospecting for oil, 1966-67; M.Sc. thesis.
470. Trettin, H.P., Geol. Surv. Can.:
Lower Triassic "Tar Sands", northwestern Melville Island, Arctic
Archipelago.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 71-73.

Coal and Peat

471. Botham, J.C., Mines Branch, Dept. of Energy, Mines and Resources:
Study of coking characteristics of coal relevant to its petrographic
constitution, 1956-.
A co-operative project with the Coal Research Laboratory of
the Geological Survey of Canada.
472. Hacquebard, P.A., Geol. Surv. Can.:
Minto coalfield, New Brunswick, 1966-.
See Geol. Surv. Can., Paper 66-2, 1966, p. 60 and 67-1A,
1967, p. 169.
473. Pollett, F., Newfoundland Dept. of Mines, Agriculture and Resources:
Peat moss survey, 1965-67; M.Sc. thesis.
Investigation of peat moss in Newfoundland has been conducted
intermittently, over a period of twelve years. The work has been
carried on by a number of workers. It is currently being completed
and a final report prepared for publication.

474. Shea, F.S., Sutherland, D.R., Nova Scotia Dept. of Mines:
Assessment of peat moss occurrences, Guysborough county, Nova
Scotia, 1964-66.
Maps of each bog show surface and subsurface contours,
sounding and sampling points and the extremities of the bog.
Chemical and physical analysis are tabulated at the end of the
report. See Peat Moss Project - Assessment of peat moss occur-
rences, Guysborough, Nova Scotia; N.S. Dept. of Mines, Stellarton,
1965 and 1966.

475. Simard, A., Quebec Dept. of Natural Resources:
Peat bogs, Quebec.
A continuing program including surveys, sampling of peat
bogs, experiments in uses of peat on farm and by industry, and
ecological studies of selected bogs.

General Problems

476. Becker, A., Geol. Surv. Can.:
Development of new electrical method of geophysical mapping of
surficial deposits and sulphide conductors, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 130-131 and
197.
477. Blais, R.A., Fortin, N., Ecole Polytechnique, Université de
Montréal:
Geostatistical studies of various metalliferous deposits 1966-68;
M.Sc. thesis (Fortin).
Applications of Georges Matheron's theory to Canadian
deposits, including computer applications to ore reserve evalua-
tion. It will cover deposits of contrasting mineralogy, grade and
structure: gold veins, massive and disseminated base-metal sul-
phide deposits, at least two types of iron deposits, etc.
478. Davies, J.C., Ontario Dept. of Mines:
French Narrows area, District of Kenora, Ontario, 1966.
See Ont. Dept. Mines, Prelim. Rept. 1966-1, pp. 10-12.
479. Descarreaux, J., Université Laval:
Metallogeny of the Temiscamingue Region, Quebec, 1966-68; D.Sc.
thesis.
480. Dugas, J., Quebec Dept. of Natural Resources:
Mineral deposits in the Labrador Trough, 1966-67.

Part of an inventory of mineral deposits in the Province of Quebec. A mineral deposits map for the Trough is being prepared.

481. Dugas, J., Duquette, G., Latulippe, M., Sharpe, J.I., Quebec Dept. of Natural Resources:
Preparation of detailed forms and preliminary maps bearing on the mineralogy and metallogeny of the metallic mineral deposits in the Province of Quebec, 1966-67.
This project follows the compilation of mineral deposits maps (B-790, 1, 2, B-835, B-850) and is the second step in the process leading to the production of a metallogenic map of the Province of Quebec.
482. Duquette, G., Quebec Dept. of Natural Resources:
Examination of mining properties and development work in the Chibougamau district, Quebec - a continuing program.
Compilation and mapping of the geology in the Chibougamau district, Quebec; 1,000 feet to 1 inch.
A continuing program of investigation including compilation of maps using the information offered by the mining companies and personal observations in the field.
483. Duquette, G., Mathieu, A., Quebec Dept. of Natural Resources:
Southwest quarter of Obalski township, Abitibi-East county, Quebec; 1,000 feet to 1 inch, 1966-67.
Part of a program of mapping in detail an economically important section of the Chibougamau greenstone belt.
484. Fleet, M.E., Univ. of Western Ontario:
Phase chemistry of iron-sulphide minerals, 1966-68.
485. Fortescue, J.A.C., Hornbrook, E.A.W., Geol. Surv. Can.:
Biogeochemical investigations, 1963-68.
To develop and evaluate techniques for exploring for minerals by sampling trees and other plants. See Geol. Surv. Can., Paper 67-1A, 1967, p. 200.
486. Gale, G., Newfoundland Dept. of Mines, Agriculture and Resources:
Pegmatites survey, 1964-67; M.Sc. thesis.
Involves geological mapping, thin section and X-ray study, chemical analysis and economic appraisal.
487. Gill, J.E., Krishnamurthy, P., Eckstrand, N.L., McGill Univ.:
Mobility of sulphides - a continuing study.
See Experimental investigation of chalcocite: annealing and plastic deformation at elevated temperatures; Can. Jour. Earth Sciences, vol. 2, pp. 98-117, 1965.

488. Goodwin, A.M., Geol. Surv. Can.:
Timmins-Kirkland Lake-Noranda volcanic belts, Ontario and
Quebec, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 138-142.
489. Grootenboer, J., McMaster Univ.:
An investigation of the fractionation of sulphur isotopes S^{32} and
and S^{34} between co-existing sphalerite and galena in synthetic
and natural equilibrium assemblages, 1966-69; Ph.D. thesis.
Partition coefficients will be measured on synthetic sulphides
produced at temperatures between 250 °C and 700 °C and the vapour
pressure of the system and compared with theoretical calculations.
Results obtained will be applied to natural sphalerite and galena
occurrences.
491. Hay, P.W., New Brunswick Dept. of Natural Resources:
Stratigraphy and structure of the Silurian Mascarene volcanics,
Charlotte county, New Brunswick, 1965-68.
Detailed field mapping to extend the Silurian stratigraphy as
deciphered in Maine into New Brunswick, to interpret the structure
of volcanics, and to determine favourable localities for detailed
mineral exploration.
492. Jeffery, W.G., British Columbia Dept. of Mines and Petroleum
Resources:
Mineral deposits in the northwest Coast Mountains of British
Columbia, 1965-.
See Report of the Minister of Mines and Petroleum Resources
1965, Lode Metals Section, pp. 19-29.
493. Jolliffe, A.W., Queen's Univ.:
Element enrichment patterns in ore deposits and their genetic and
geochemical significance, 1950-.
The main purpose is to test and extend a new geochemical
approach to the study of ore deposits.
The role of mineral technology in the history of science, 1963-.
494. Jolliffe, A.W., George, P.T., Queen's Univ.:
A geochemical study of ores and rocks in the Porcupine-Kirkland
Lake area, 1963-66; M.Sc. thesis (George).
A detailed geochemical study involving chiefly trace-element
patterns in millhead, vein, and wallrock samples from the
Timmins-Kirkland Lake area.

495. Kaiman, S., Hughson, M.R., Mines Branch, Dept. of Energy, Mines and Resources:
Mineralogical investigation of ore samples.
Determination of the mineralogical composition of ores and mill products to provide mineralogical information in connection with ore treatment studies.
496. Kingston, P.W.E., Queen's Univ.:
Study of certain sulpho-salt minerals especially those containing PbS and Bi₂S₃, 1966-68; Ph.D. thesis.
497. Kirkham, R.V., British Columbia Dept. of Mines and Petroleum Resources:
Geothermometry and mineral zoning of metalliferous deposits in the Hudson Bay Mountain area, west-central British Columbia, 1963-67; Ph.D. thesis.
498. Kish, L., Quebec Dept. of Natural Resources:
Lake Otelnuk area, New-Quebec, 1965-66.
Detailed study of geochemically anomalous areas in the Labrador Trough detected in 1964 in the course of routine sampling of stream sediments.
499. Krishnamurthy, P., McGill Univ.:
Experimental deformation of ores, 1966-67; M.Sc. thesis.
500. Latulippe, M., Quebec Dept. of Natural Resources:
Compilation and mapping of the geology in the Val d'Or district, Quebec; 1,000 feet to 1 inch.
A continuing program of investigation including compilation of maps using the information offered by the mining companies and personal observations in the field.
Examination of mining properties and development work in the Val d'Or district, Quebec - a continuing program.
501. Lee, H.A., Geol. Surv. Can.:
Glaciofocus research, 1962-.
A long range study using glacial methods of mineral exploration in the Canadian Shield. See Geol. Surv. Can., Paper 67-1A, 1967, p. 149.
502. Longe, R.V., McGill Univ.:
Metal content of sulphides in volcanics and its change with igneous fractionation, 1966-68.

503. MacIntosh, J.A., Quebec Dept. of Natural Resources:
Southeast quarter of Nelligan township, Abitibi-East county,
Quebec; 1,000 feet to 1 inch, 1966-.
Detailed mapping in an area of volcanic rocks susceptible
of economic mineralization.
504. McCartney, W.D. and graduate students, Queen's Univ.:
Study of trace element content and variations in sulphides of
selected ore deposits, 1966-.
505. McDougall, D.J., Loyola College:
Thermoluminescence of rocks, 1962-.
See A study of the distribution of thermoluminescence
around an ore deposit; Economic Geology, Oct. 1966.
506. Milligan, G.C., Creed, R.M., Chatterjee, A.K., Sinha, R., White,
B., Dalhousie Univ.:
Investigations in George River Series, Cape Breton, Nova Scotia,
1962-; M.Sc. theses (Creed, Chatterjee and Sinha).
It has been necessary to spend much time in routine mapping
to find the stratigraphy and structure of the Series, heretofore
essentially unmapped. More detailed investigations in vicinity of
known mineralization are now being undertaken.
507. Moore, J.C.G., Mount Allison Univ.:
Rock geochemistry as an aid in the search for orebodies, 1963-68.
Includes sampling and analyses of the rocks around massive
sulphide orebodies in New Brunswick to determine if detectable
trace elements as well as major elements can be used to lead to
the discovery of additional mineral deposits in the province. The
objective is to find haloes of dispersed elements of target indicators
that will enlarge the target areas for mineral exploration.
508. Nickel, E.H., Petruk, W., Cabri, L.J., Mines Branch, Dept. of
Energy, Mines and Resources:
Mineralogical investigation of Canadian ores in conjunction with
mineral processing research, 1953-.
A wide range of ores is currently being studied mineralogically;
much of the data are also useful in the field of economic geology.
509. Potter, R.R., New Brunswick Dept. of Natural Resources:
Metallogenic studies in New Brunswick, 1965-70.
The purpose is to examine and evaluate all the known mineral
deposits of New Brunswick, and determine their spatial and temporal
relationships to the structural and stratigraphic development of
this part of the Appalachian folded belt. A regional study will be
completed first; a metallogenic map of the Province (1:500,000) is
being compiled.

510. Procyshyn, E.L., Univ. of Manitoba:
Shape of ore deposits, 1965-67; M.Sc. thesis.
A study of the dimensions and orientation of Canadian ore-bodies.
511. Ridler, R.H., Geol. Surv. Can.:
Volcanic-sedimentary stratigraphy and its relation to mineral occurrences, Kirkland Lake, Ontario, 1966-; Ph.D. thesis.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 159-162.
512. Roscoe, S.M., Geol. Surv. Can.:
Metallogenetic studies of Huronian rocks, Ontario and Quebec, 1961-66.
To study the stratigraphy and geochemistry of Huronian rocks with special attention to basal contact and metalliferous concentrations related thereto. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 21-22 and pp. 210-212.
513. Sangster, A., McCartney, W.D., Queen's Univ.:
Metallogenic studies in Grenville Province, Ontario, 1966-68;
Ph.D. thesis (Sangster).
Field and laboratory study of selected mineral deposits in relation to their regional and detailed geology, including structural, lithological, and metamorphic variations.
514. Sauvé, P., Quebec Dept. of Natural Resources (parttime), Université, Laval:
Petrology and metallogeny of a gabbro sill near Gerido Lake, New-Quebec, 1966-.
515. Sharpe, J.I., Quebec Dept. of Natural Resources:
Compilation and mapping of the geology in the Rouyn-Noranda district, Quebec; 1,000 feet to 1 inch.
A continuing program of investigation including compilation of maps using information offered by the mining companies and personal observations in the field.
Examination of mining properties and development work in the Rouyn-Noranda district, Quebec - a continuing program.
516. Sherwood, H.G., Univ. of Manitoba:
Quantitative mineralogy of ore deposits, 1964-67; Ph.D. thesis.
517. Speelman, E.L., McMaster Univ.:
The sulfur isotopic composition of sulfides and sulfur-bearing silicate minerals from rocks of the Haliburton-Bancroft-Madoc area of the Grenville Province, 1961-67; Ph.D. thesis.

An attempt to use sulfur isotope abundances as tracers in order to determine the extent to which sulfur is mobile. Complementary to this, a study is being made of sulfide-sulfide and sulfide-sulfate fractionations between coexisting mineral pairs.

518. Stauffer, M.R., Univ. of Saskatchewan:
Geometry of folded linear orebodies.
To derive geometric techniques for recognizing and tracing folded linear orebodies.
519. Sutherland-Brown, A., British Columbia Dept. of Mines and Petroleum Resources:
Investigation of mercury dispersion haloes, 1965-67.
See Investigation of mercury dispersion haloes around mineral deposits in central British Columbia; Symposium on Geochemical Prospecting, Geol. Surv. Can., Paper 66-54, 1966.
520. Wolfe, W.J., New Brunswick Dept. of Natural Resources:
Regional geochemistry of stream sediments and waters in southwestern and central New Brunswick, 1966-70.
See Geochemistry of Cu, Pb, Zn, Ni, Co, Ag, As, Sn, Mo and Mn in stream sediments of southwestern Charlotte county, New Brunswick; New Brunswick Department of Natural Resources, report and maps in preparation for publication in 1967.
521. Wolhuter, L.E., Quebec Dept. of Natural Resources (part time), McGill Univ.:
Opemiska area, Abitibi-East county, Quebec, 1966; Ph.D. thesis.
Revision of formations and structures prior to production of a final report.

MINERALOGY

Specific Minerals

522. Aarden, H.M., Gittins, J., Univ. of Toronto:
A study of minerals of the wöhlerite and mosandrite-rinkite group and other rare minerals, 1964-; Ph.D. thesis (Aarden).
An unusual feldspathoidal complex containing a wide variety of rare fluor-silicates of Ca, Nb, rare earths and Zr is being investigated chemically and crystallographically to provide accurate mineralogical data.
523. Aumento, F., Geol. Surv. Can.:
Serpentine mineralogy, Eastern Townships, Quebec, 1966.

524. Berry, L.G., Queen's Univ.:
Study of lathite, 1965-67.
See Abstract in Program of 1966 Annual Meeting of G.A.C.
and M.A.C., Halifax, N.S., 1966.
525. Chao, G.Y., Hounsflow, A.W., Carleton Univ.:
Crystal structure of chlorapatite, 1965-67; M.Sc. thesis
(Hounsflow).
526. Chao, G.Y., Nakashiro, M., Carleton Univ.:
Crystal structure of leucophanite and meliphanite, 1966-; Ph.D.
thesis (Nakashiro).
527. Ferguson, R.B., Univ. of Manitoba:
Structural studies on the feldspars, 1950-.
Current work involves writing a computer program which
will calculate the electrostatic charge distributions in all the end-
member feldspar structures under a number of reasonable assump-
tions. The purpose is to see whether the feldspar structures can
reasonably be regarded as purely ionic. The results have an
important bearing on the low-temperature phase relationships of
the feldspars. See A three-dimensional refinement of the structure
of low albite - Norsk Geologisk Tidsskrift, 1962, vol. 42, pp. 152-
157.
528. Forman, S.A., Rowland, J.F., Gabe, E.J., Mines Branch, Dept. of
Energy, Mines and Resources:
The crystallography and structure of sphalerite, 1964-67.
Includes a study of the effect of iron on the lattice parameters
of sphalerite, elucidation of the problem of interstitial versus sub-
stitutional incorporation of the iron, and a study of the sphalerite-
wurtzite transition.
529. Gait, R.I., Univ. of Manitoba:
Crystal structure studies of the feldspar minerals, 1964-67.
530. Grundy, H.D., McMaster Univ.:
A refinement of the atomic structures of different cancrinites with
a view to determining cation site occupancies, 1966-.
531. Haughton, D.R., McMaster Univ.:
Investigation of calcium concentration in coexisting plagioclase and
scapolite, 1965-67; M.Sc. thesis.
Analysis with the electron microprobe to elucidate some of
the petrology of scapolite. Studies are in hand on specimens from
areas of low grade regional metamorphism, skarn deposits, and an
anorthosite.

532. Hobart, A. (Miss), Univ. of Ottawa:
Mineralogical study of acmite from Templeton township, Quebec,
1964-66; M.Sc. thesis.
533. Hogarth, D.D., Buchanan, R.M., Univ. of Ottawa:
New occurrence of specite, 1962-.
534. Jambor, J., Geol. Surv. Can.:
Mineralogy of vein carbonates, Cobalt, Ontario, 1966.
535. Kingston, P.W.E., Queen's Univ.:
Study of certain sulpho-salt minerals especially those containing
PbS and Bi₂S₃, 1966-68; Ph.D. thesis
536. Ledoux, R.L., Lakatos, S., Université Laval:
Infrared studies of OH bands in sepiolite and attapulgite, 1966-67;
M.Sc. thesis (Lakatos).
Sepiolite and attapulgite show 5 α (OH) absorption bands between
3700 and 3300 cm⁻¹. The project deals with assignments of OH
frequencies to OH sites in the structure of these minerals.
537. Perrault, G., Ecole Polytechnique, Université de Montréal:
The structure of eucolite, 1965-68.
538. Perrault, G., Le Page, Y., Ecole Polytechnique, Université de
Montréal:
Diffraction of clinopyroxenes, 1962-68; M.A.Sc. thesis
(Le Page).
539. Pouliot, G., Ecole Polytechnique, Université de Montréal:
Study of carbonate minerals in the carbonite intrusion at Oka,
Quebec, 1966-68.
The systematic determination of carbonate minerals in the Oka
carbonatite including the chemistry of the carbonate minerals (trace
element content) and its influence on their physical properties.
540. Quigley, R.M., Dreimanis, A., Univ. of Western Ontario:
Secondary aragonite in a soil profile, 1966.
See Secondary aragonite in a soil profile, Earth and Planetary
science letters, vol. 1, pp. 348-350, 1966.
541. Radcliffe, D., Berry, L.G., Queen's Univ.:
Study of safflorite-loellingite minerals, 1951-66; Ph.D. thesis
(Radcliffe).

542. Ripley, L.G., Mines Branch, Dept. of Energy, Mines and Resources:
Growth of Single Crystals of Base Metal Sulphides of Controlled
Composition, 1964-.
At present attempts are being made to grow zinc sulphide
single crystals of controlled composition, and sufficient size, to
permit investigation of physical and electrical properties. Vapour
transport techniques are currently being investigated.
543. Sizgoric, M., McGill Univ.:
Crystal chemistry of tin oxide, 1966-67; M.Sc. thesis.
544. Sood, M.K., Edgar, A.D., Univ. of Western Ontario:
Hydrothermal chemistry of iron-bearing melilites, 1965-67; M.Sc.
thesis (Sood).
545. Trembath, L.T., Univ. of New Brunswick:
Zeolites in the Triassic basalts of Grand Manan, New Brunswick,
1965-67.
Determination of assemblages in a series of sills and flows
combined with an attempt to relate the assemblages to the rock
composition and the geologic environment.
546. Williamson, D.H., Laurentian Univ. of Sudbury:
Crystal structure studies of feldspars from Caledonia Mountain,
southeastern New Brunswick, 1966-68.
Crystal structure studies of feldspars are being undertaken in
an attempt to establish the kind of relationship existing between
chemical and physical data and the origin and paragenesis of the
feldspars in the plutonic and associated metamorphic rocks of
Southern New Brunswick.
547. Wynne-Edwards, H.R., Fletcher, C.J.N., Queen's Univ.:
Local equilibrium in amphibolite from Parham, Ontario, 1966-67;
M.Sc. thesis (Fletcher).
Electron-probe investigation of the variations in chemical
composition of minerals in small areas of a layered amphibole-
pyroxene gneiss.
548. Van Loon, J.C., Aarden, H.M., Univ. of Toronto:
Chemical analysis of a group of complex zirconium-rare earth-
calcium silicates, 1965-67; Ph.D. thesis (Aarden).
549. Van Loon, P.R., McGill Univ.:
A crystal structure analysis of aenigmatite, 1961-67; Ph.D.
thesis.

General Problems

550. Brooker, E.J., Univ. of Toronto:
X-ray fluorescence analysis of rocks and minerals for major and minor constituents, 1965-.
See X-ray spectrographic analysis of minute mineral samples; Can. Mineralogist, vol 8, pt. 4, 1966.
551. Cabri, L.J., Mines Branch, Dept. of Energy, Mines and Resources:
Investigation of platinum group minerals, 1965-.
See New palladium minerals from Noril'sk Western Siberia, Canadian Mineralogist, vol. 8, pt. 5, (in press).
552. Chao, G.Y., Chen, T., Carleton Univ.:
Minerals from Desourdy Quarry, Mt. St. Hilaire, Quebec, 1964-;
M.Sc. thesis (Chen).
See Minerals from Desourdy Quarry, Mt. St. Hilaire, Quebec, a preliminary report. Presented to the 1966 meeting of the Mineralogical Association of Canada, Nova Scotia, 1966.
553. Dean, R.S., Mines Branch, Dept. of Energy, Mines and Resources:
Mineralogy of argillaceous materials in Canada, 1958-.
See The Composition and Properties of Ceramic Clays and Shales of Ontario, Jour. Can. Cer. Soc. (vol. 34), (1965).
554. Gabe, E.J., Mines Branch, Dept. of Energy, Mines and Resources:
Development of a laboratory for the automated structure analysis of minerals, 1966-67.
A laboratory is being equipped to provide the capability of undertaking the crystal-structure analysis of minerals. A four-circle single-crystal goniometer is being combined with an on-line computer to control the setting and collect the intensity data necessary for the determination of crystal-structure.
Computer programs for X-ray crystallography, 1966-.
A comprehensive series of programs for X-ray crystallography and crystal-structure analysis is being developed. Completed programs include: The calculation of inter-atomic angles and distances; the calculation of drilling jig settings for the construction of structure models; a searching program that uses space-group and atomic parameter data to scan a crystal structure for neighbouring atoms to a variable limit and then computes interatomic distances and angles for all the atoms located; and a program to generate the angular settings for a diffractometer applicable to all crystal systems.
555. Golightly, J.P., McGill Univ.:
Absorption spectra of some minerals, 1964-67; Ph.D. thesis.

556. Goodman, R.H., Mines Branch, Dept. of Energy, Mines and Resources:
The Mössbauer effect in (Zn,Fe)S solid solutions, 1964-66.

The objectives are to study the electric and magnetic environment of iron nuclei in (Zn,Fe)S solid solutions as a function of temperature, concentration of impurities and the effects of surface ions, using the Mössbauer effect in Fe-57. See The Use of an On-Line Computer for Mössbauer Effect Experiments, Rev. Sci. Inst. vol. 37, No. 3, 1966.

Valence states of iron in pyrrhotite, 1965-66.

The objective is to determine the valence states of iron in pyrrhotite by the use of the Mössbauer effect.

557. Horwood, J.L., Keys, J.D., Mines Branch, Dept. of Energy, Mines and Resources:

The magnetic susceptibility of (Zn,Fe)S solid solutions, 1964-67.

Objectives are to measure the magnetic susceptibility due to unpaired electron spins and to relate this information to the cohesive forces of Fe in (Zn,Fe)S.

558. Hughson, M.R., Kaiman, S., Mines Branch, Dept. of Energy, Mines and Resources:

High temperature X-ray diffraction analysis, 1967-.

Use of Rigaku Denki X-ray diffraction camera for identification of crystalline synthetic compounds at temperatures up to approximately 1400°C and for studying transformations of the crystalline structure.

559. Kaiman, S., Hughson, M.R., Mines Branch, Dept. of Energy, Mines and Resources:

Mineralogical investigation of ore samples.

Determination of the mineralogical composition of ores and mill products to provide mineralogical information in connection with ore treatment studies.

560. Keys, J.D., Baleshta, T.M., Mines Branch, Dept. of Energy, Mines and Resources:

Electrical properties of sulphide minerals, 1965-67.

The objective is to determine the mechanism of electrical conductivity in sulphide minerals.

561. Ledoux, R.L., Sabourin, R., Cimon, J., Université Laval:

Formation of kaolin minerals from anorthosite at Chateau Richer, Quebec, 1965-68; M.Sc. thesis (Cimon).

An investigation of the nature of the kaolin minerals, their hydration and dehydration behaviour, the ordering of their structure, and their genesis.

562. Nickel, E.H., Mines Branch, Dept. of Energy, Mines and Resources:
The fundamental properties of sulphide minerals, 1964-.
The investigation of the fundamental properties of sulphide minerals, including structure, bonding, and optical and physical properties to provide basic information of value in the utilization of sulphide ores. See Metallic Lustre and the Forbidden Energy Gap, Can. Mineralogist, vol. 8, 399 (1965).
563. Nickel, E.H., Butterhill, J.D., Mines Branch, Dept. of Energy, Mines and Resources:
Determination of the refractive index of minerals by the Brewster Angle method, 1965-66.
The method appears to give reliable results for silicate and oxide minerals. Sulphide minerals do not give reliable results because of their generally high optical absorption coefficients and because of the formation of thin oxide films on the mineral surface.
564. Nickel, E.H., Petruk, W., Cabri, L.J., Mines Branch, Dept. of Energy, Mines and Resources:
Mineralogical investigation of Canadian ores in conjunction with mineral processing research, 1953-.
A wide range of ores is currently being studied mineralogically; much of the data are also useful in the field of economic geology.
565. Nuffield, E.W., Univ. of Toronto:
Studies of ore minerals - a continuing project.
See Studies of mineral sulpho-salts: XX---Berryite, a new species; Canadian Mineralogist, vol. 8, No. 4, pp. 407-413, 1966.
566. Papezik, V.S., Memorial Univ. of Newfoundland:
Arsenic minerals in Newfoundland, 1966-.
Arsenic minerals (including small quantities of native arsenic) are associated with Ordovician rocks of volcanic origin at many localities in Newfoundland. A detailed study of their composition, associations and geological setting may help to determine the physiochemical environment of formation of the minerals and their host rocks.
567. Perrault, G., Ecole Polytechnique, Université de Montréal:
Mineralogy of Mont St. Hilaire, Quebec, 1964-70.
Preparation of standards for the electron microprobe, 1966-70.
It is proposed to begin with collection, examination and analyses of materials to cover the feldspar field.

568. Perrault, G., Le Page, Y., Ecole Polytechnique, Université de Montréal:
Programmation électronique pour les recherches en cristallographie, 1966-70; thèse de maîtrise (Le Page).
Voir Calcul et tracés de synthèses de Fourier et de Patterson par une calculatrice électronique, 34e congrès annuel de l'ACFAS, Québec, Nov. 1966.
569. Perrault, G., Poupard, M., Ecole Polytechnique, Université de Montréal:
Une modification à l'appareil Bond pour la fabrication de spécimens sphériques pour les mesures radio-cristallographiques, 1966-68.
Voir Un appareil Bond modifié pour la préparation d'échantillons sphériques pour les études cristallographiques; 34e congrès annuel de l'ACFAS, Québec, Nov. 1966.
570. Petruk, W., Mines Branch, Dept. of Energy, Mines and Resources:
Mineralogy of the silver deposits in the Cobalt and Gowganda areas, Ontario, 1964-67.
A systematic study is being made of the deposits in the Cobalt and Gowganda areas in order to obtain detailed information on their mineralogical and chemical characteristics. It is hoped that this will lead to a better understanding of ore deposition processes and will serve as a useful aid in exploration and ore utilization.
571. Rucklidge, J.C., Univ. of Toronto:
X-ray emission microanalysis of rock forming minerals, 1966-67.
An extensive series of chemically analyzed amphibole specimens are being examined by electron microprobe techniques. The data will be processed by computer, as described in the following reference, and the results will provide comparative information on the two methods of analysis. See A computer program for processing micro-probe data; Jour. Geol., January 1967.
572. Sabourin, R., Ledoux, R.L., Université Laval:
Kaolinization of an anorthosite near Chateau-Richer, Quebec, 1965-67.
573. Salter, D.L., Univ. of Waterloo:
Mineralogy of argillaceous sediments of Southern Ontario, 1967-.
The mineralogy of sediments by means of X-ray diffractometry.

574. Soles, J.A., Mines Branch, Dept. of Energy, Mines and Resources:
Mineralogy and petrography of construction materials and their
response to environmental conditions, 1957-.
See Effect of Elevated Temperatures on Two Anorthositic
Rocks, Mines Branch Investigation Report IR 65-39 (1965) .
575. Starkey, J., Univ. of Western Ontario:
The interrelationship of the crystal chemistry and crystal struc-
ture of rock forming minerals, 1966-.
The mineral groups currently being investigated are the
plagioclase feldspars, the trioctahedral micas and the garnets.
See On the Relationship of Pericline and Twinning to the Composition
and Structural State of Plagioclase feldspar. Schweizerische
Mineralogische und Petrographische Mitteilungen (Laves volumn),
in press.
576. Stevenson, J.S., Stevenson, L.S., McGill Univ.:
Mineralogical study of teeth from Carboniferous land animals,
Joggins, Nova Scotia from the Dawson Collection, 1962-.
See Fluorine content of Microsaur Teeth from the Carboniferous
rocks of Joggins, Nova Scotia; Science, vol. 154, 1966.

PALAEONTOLOGY

577. Barnes, C.R., Univ. of Waterloo:
Conodont biofacies analysis of some Wilderness (Middle Ordovician)
limestones, Ottawa Valley, Ontario, 1961-67, Ph.D. thesis,
Univ. of Ottawa.
See Stratigraphy and sedimentary environments of some
Wilderness (Ordovician) limestones, Ottawa Valley, Ontario.
Can. J. Earth Sci., in press.
Caradocian (Ordovician) conodonts from Wales, 1965-68.
Welsh Caradocian limestones were sampled for conodonts
to provide further knowledge of the various faunas within the
graptolitic succession and to allow comparison with those of the
North American mid-continental province. The conodonts from the
Robeston Warthen Limestone (and equivalents) and the Shoalshook
Limestone are receiving particular attention.
Conodont biostratigraphy of the Wilderness stage (Middle
Ordovician) in Ontario, Quebec and northern New York State
and a preliminary survey of Middle Devonian conodonts of
southwestern Ontario, 1966.
Sampling for conodonts at 36 localities in Ontario, Quebec,
and New York State within the Black River Group and lowermost
Trenton Group has been completed and study of the faunas is in
progress.

578. Barnes, C.R., Univ. of Waterloo, Sass, D.B., Alfred University, New York:
Electron microscopy of conodonts.
Preliminary electron microscope studies of Ordovician conodonts has yielded promising results and the work is presently concentrating on specimens of Drepanodus, Belodina, Ptiloconus, and Polyscaulus. It is hoped that additional information will be forthcoming on the relationships between the conodontiformes and the neurodontiformes.
579. Barnes, C.R., Univ. of Waterloo, Tuke, M.F., University of Oxford, England:
Conodonts from the St. George Formation (Lower Ordovician), western Newfoundland, 1965-67.
Ordovician formations in western Newfoundland mapped by Tuke were sampled for conodonts and those obtained from the St. George Formation are currently under investigation by Barnes.
580. Barss, M.S., Geol. Surv. Can.:
Spores from the Mississippian Horton, Windsor and Canso Groups and the Pennsylvanian Riversdale, Cumberland and Pictou Groups of the Atlantic Provinces.
See Geol. Surv. Can., Paper 66-2, 1966, p. 59.
581. Beerbower, J.R., McMaster Univ.:
Structural changes in Devonian marine fossil assemblages.
The Hamilton Group of western New York yields samples of essentially undisturbed level bottom communities. The distribution of taxonomic and morphologic parameters over a single bedding plane yields a set of data which can be organized, by use of information theory, into a set of dimensionless numbers. These numbers express the level of organization of the community. Successive samples will be drawn from the Hamilton and the organization values analyzed for time trends. The evolution of individual population lineages composing these communities will then be examined in relation to community structural trends.
582. Bray, R.G., McMaster Univ.:
The biologic structure of a Mid-Devonian contagiously distributed fauna, 1964-68; Ph.D. thesis.
Recent examination of a Mid-Devonian fossil assemblage in Erie county, western New York, indicates that organic clusters or nests have a biologic origin. Research is concerned with evaluating the effects geologic agents have had on the original life community. It is expected that this information, coupled with time trends in the community will constitute evidence of several trends in marine flat bottom communities.

583. Caldwell, W.G.E., Frison, E.H., Jordan, D.L., Univ. of Saskatchewan:
Devonian faunas from northwestern Canada, 1960-.
584. Carroll, R.L., McGill Univ.:
Study of the origin and early differentiation of the Class Reptilia,
and the relationship of reptiles to anthracosaur amphibians,
1962-.
- Immediate work includes writing a chapter on the origin of
reptiles for volume I of the Biology of the Reptiles being edited
by Bellairs, Gans and Williams for publication by Academic
Press. See The earliest reptiles; J. Linn. Soc. (Zool.), vol. 45,
pp. 61-83, 1964.
- Study of the morphology, phylogeny and relationships of the Order
Microsauria (Palaeozoic, lepospondyl amphibians), 1962-68.
- The order microsauria consists of twenty to thirty genera of
small, generally poorly preserved, Palaeozoic amphibians. They
have been suggested as possible ancestors of both reptiles and
the modern salamanders and apodans. This study was undertaken
in an effort to determine the possibility of these relationships.
All known genera are being restudied and new descriptions pre-
pared. See An adelogyrinid lepospondyl amphibian from the Upper
Carboniferous; Canadian Journal of Zoology, vol. 45, 20 pp.,
January 1967 (in press).
585. Churcher, C.S., Kisko, L.M., Royal Ontario Museum:
Pleistocene mammalian faunas of the New World, 1959-; M.Sc.
thesis (Kisko).
- This investigation covers the identification and osseous
anatomy of the various mammals found in two major deposits,
the Talara Tar-Seeps, Peru, and the Pleistocene of Medicine
Hat, Alberta. See Camelid material of the genus Palaeolama
Gervais from the Talara Tar-Seeps, Peru, with a description of
a new subgenus, Astylolama; Proc. Zool. Soc. Lond., 145 (2)
pp. 161-205, 1965.
586. Copeland, M.J., Geol. Surv. Can.:
Palaeozoic microfossils and nontrilobite Arthropoda of Canadian
Arctic and Eastern Canada.
- See Some Lepertidiid Ostracoda from the Richardson
Mountains, Northern Yukon Territory, Proc. Geol. Assoc.
Canada, vol. 17.
587. Cox, R.L., Geol. Surv. Can.:
Palaeontologic study of Mesozoic and Tertiary rocks, Assiniboine,
Manitoba, 1966.
- Cretaceous dinoflagellates and acritarchs from Western Canada,
1966-68; Ph.D. thesis, Stanford Univ.

588. Delorme, L.D., Geol. Surv. Can.:
A study of freshwater Ostracoda from Delta, Manitoba, 1966-.
589. Dineley, D.L., Broad, D.S., Univ. of Ottawa:
Ostracoderms and placoderms from the Siluro-Devonian of Canada, 1961-; Ph.D. thesis (Broad).
Broad is engaged upon a study of Cephalaspida, Pteraspis, and Ctenaspis from Prince of Wales Island, N.W.T.; Dineley is studying Cyathaspida, Traquairaspida, and other agnatha from Somerset Island, N.W.T., the Cordilleras and Eastern Canada. See An occurrence of Coryaspis (Ostracodermi) in Canada; Can. J. Earth Sciences, No. 2, vol. 93, 1965.
590. Edmund, A.G., Royal Ontario Museum:
Osteology and evolutionary history of Late Pleistocene Edentates, 1959-.
This project is based on the large collections from Peru and Ecuador made in 1958 and 1961. Field trips to museums in Europe and the Americas have given data in the form of measurements, photos, notes and casts, permitting revision and detailed description of three sub-families; Chlamytheriinae, Scelidotheriinae and Megatheriinae. Several publications will result, including well-illustrated osteologies of typical species, and a zoogeographic study of each sub-family. See Essonodotherium Gervaisi is a junior synonym of Megatherium americanum; Ameghiniana, Buenos Aires, Argentina (in press).
591. Ferguson, L., Mount Allison Univ.:
A study of the Scottish Carboniferous ostracod genera Bairdia and Paraparchites, 1965-67.
Growth series of both Bairdia and Paraparchites from restricted vertical intervals are being compared with the type specimens of numerous "species" of these genera which have been previously recorded from the same locality. The object is to reduce the number of spurious species within each genus by "lumping" together those forms which are obvious instars of one species.
Compacting-distortion of fossil brachiopods and its bearing on taxonomy, 1959-66.
The study is at present concentrated on the distortion of productids. See Distortion of Crurithyris urei (Fleming) from the Viséan rocks of Fife, Scotland, by compaction of the containing sediments; J. of Palaeontology, vol. 35, No. 1, pp. 115-119, 1962.
A stratigraphic and palaeoecologic study of the Permo-Pennsylvanian productid genus Waagenoconcha Chao from the Yukon and Northwest Territories.

Involves the correlation of shell size stage at which geniculation occurs and coarseness of ornament with stratigraphic position and sediment types.

A study of some orthropodan trackways from Joggins, Nova Scotia, 1966-.

See The recovery of some large track-bearing slabs from Joggins, Nova Scotia; Maritime Sediments, vol. 2, No. 3, July, 1966, pp. 128-130.

592. Ferguson, L., Mount Allison Univ., O'Brien, N.R., New York State College:

A study of the origin of fissility in shale, 1964-67.

Involves the correlation of X-ray data on the nature and orientation of the clay particles of the shale with palaeontological and palaeoecological data from the same bed. See A comparison of two techniques for measuring shale compaction; Sedimentary Petrology, vol. 34, No. 3, Sept. 1964, pp. 694-695.

593. Ferrigno, K., Univ. of Western Ontario:

Middle Devonian conodonts of the Dundee Limestone, St. Marys, Ontario, 1966-67; M.Sc. thesis.

The objectives are to 1) describe the conodont fauna and correlate with other areas and to determine yield by different sample collecting systems.

594. Fox, R.C., Univ. of Alberta:

Studies on Late Cretaceous Vertebrates: I. The Braincase of Champsosaurus (Reptilia; Choristodera), 1966-67.

Specimens in the collections of the University of Alberta have permitted a thorough investigation of the cranial anatomy of this animal with the aim of clarifying its relationships. See Report presented to annual meeting of the Society of Vertebrate Palaeontologists, 16-18 Nov., 1966.

Studies on Late Cretaceous Vertebrates: II. A New Fossil Salamander, 1966-67.

This specimen is a complete, apparently limbless, salamander from the Edmonton Formation. In so far as now known, its description will result in a genus new to science. The excellence of preservation of the specimen is unique among salamanders of this age.

Studies on Late Cretaceous Vertebrates: III. The Micro-vertebrates of the Edmonton Formation, Upper Cretaceous, Alberta, 1967-.

Jason A. Lillegraven, University of Kansas, is studying the mammalian fauna of the Upper Edmonton Formation, in a cooperative project (Ph.D. thesis, 1968). Fox is studying the non-mammalian remains of the Upper Edmonton, and all micro-vertebrates from the Lower Edmonton.

Studies on early Tertiary Vertebrates: II. A mammalian jaw from the Paskapoo Formation of Alberta, 1966-67.

The study of a mammalian jaw from a well-core in Palaeocene sediments should add to our limited knowledge of Albertan Palaeocene mammals.

595. Fox, R.C., Colwell, J., Univ. of Alberta:

Studies on early Tertiary Vertebrates: I. Microvertebrate remains in the Cypress Hills, Alberta, 1966-.

Collections made in September 1966 from a local concentration of microvertebrates in southeastern Alberta have revealed multituberculates in association with Oligocene faunal elements. Studies on Late Cretaceous Vertebrates: IV. Microvertebrates of the Oldman Formation, Upper Cretaceous, Alberta, 1966-.

The nature of the vertebrate assemblages in the Oldman Formation in the attempt to discover what kinds of fish, amphibians, reptiles, mammals and birds were preserved and how these compare with those in the Edmonton. From collections made in 1966, a preliminary list of seven mammalian genera new to the Oldman Formation has been compiled, and at least three genera hitherto unknown have been found.

596. Frebold, H., Geol. Surv. Can.:

Stratigraphic-palaeontologic study of Jurassic of Canada, 1959-. The basal beds of the Lower Jurassic in the Foothills and Rocky Mountains.

See Geol. Surv. Can., Paper 67-1A, 1967, pp. 200-201.

Lower Jurassic ammonite faunas from Queen Charlotte Islands and Rocky Mountains, 1965.

See Geol. Surv. Can., Paper 67-1A, 1967, pp. 200-201.

597. Getty, T.A., McMaster Univ.:

Study of Jurassic ammonite fauna from central highlands of West New Guinea, 1965-67; M.Sc. thesis.

A study of the fauna from the Kemaboe Valley in West New Guinea and the assignation of these forms to the correct part of the stratigraphic succession; the relation of this fauna to other faunas of the same age in the Pacific and Indo-Madagascar areas and correlation of standard succession of Northwest Europe.

598. Gordon, W.A., Univ. of Saskatchewan (Regina):
Jurassic foraminifera (subsurface) from Saskatchewan.
599. Greggs, R.G., Queen's Univ.:
Upper Cambrian trilobite faunas of the Franconian of Alberta and
Cambrian sedimentology of the Croixan area, 1960-.
See Upper Cambrian Rock Nomenclature of the southern
Rocky Mountains; Geol. Surv. Can., Paper 66-49, 1967.
600. Harriss, R.C., McMaster Univ.:
Chemistry of freshwater invertebrate skeletal material, 1966-.
Study of the factors controlling the transfer of trace metals
from aqueous systems to carbonate shell material with particular
emphasis on calcification mechanisms.
601. Hofmann, H.J., Geol. Surv. Can.:
Precambrian biostratigraphy, 1966-.
A program of systematic study of Precambrian fossils. See
Geol. Surv. Can., Paper 67-1A, 1967, p. 205.
602. Jackson, D.E., Etherington, J., Univ. of Alberta:
Taxonomy and biostratigraphy of graptolites in Western Canada,
1966-68; M.Sc. thesis (Etherington).
603. Jansonius, J., Imperial Oil Ltd., Calgary:
Systematics of the Chitinozoa.
See Systematics of the Chitinozoa, Review of Palaeobotany
and Palynology, 1967.
604. Kasewater, R.M., McMaster Univ.:
Study of the palaeoecology of a part of the Middle Devonian of
western New York, 1966-68; M.Sc. thesis.
A three-foot section containing bryozoans, brachiopods,
corals and trilobites is being studied with a view to determining
if the community is a sere..
605. Lespérance, P.J., Université de Montréal:
Upper Ordovician, Silurian, and Lower Devonian trilobites from
the Quebec Appalachians; stratigraphy of the strata yielding
the trilobites, 1962-.
The project began on, and has been mainly confined to, the
trilobites of the White Head Formation from the Percé region,
Quebec (Caradoc, Ashgill, and Llandovery). Trilobites from the
other strata have also been collected, but so far they have not
been so abundant as those from the White Head. The long-term
objective of the project is to zone the Silurian with the aid of
trilobites.

606. Logan, A., Univ. of Calgary:
Permian brachiopods of Yukon Territory, 1966-67.
607. Mamet, B.L., Université de Montréal:
Zonation du Carbonifère Inférieur marin par micro-fossiles.
Application aux bassins canadiens, 1965-68.
Essai de comparaison entre les zones nord-américaines et eurasiatiques: Le projet démontre l'utilité de 17 zones d'assemblages de Foraminifères au Carbonifère Inférieur. Cette étude se cantonne à la phylogénie de Foraminifères calcaires secrétés en lames minces (en particulier Endothyridae, Tournayellidae et Archaediscidae). See A comparison of the Lower Carboniferous microfauna in Europe and United States, 5ème Congrès pour l'avancement de la stratigraphie du Carbonifère, 1967, 22 pages.
608. Mason, D., Chevron Standard Ltd., Calgary:
Lower and Middle Devonian conodont faunas.
609. McGregor, D.C., Geol. Surv. Can.:
Early and Middle Devonian spores of Gaspé, and Middle and Late Devonian spores of Arctic Mainland and islands.
See Composition and range of some Devonian spores assemblages of Canada, Review of Palaeobotany and Palynology, vol. 1.
610. McIntyre, D.J., Chevron Standard Ltd., Calgary:
Palynological studies of the Mesozoic and Tertiary of Western Canada.
611. Medioli, F., Dalhousie Univ.:
Foraminiferal ecology on the Scotian Shelf, 1966-68.
Cultivation, in the laboratory, of foraminiferal species of common occurrence in the Scotian Shelf, under controlled conditions of salinity, temperature, light etc.
612. Mehrotra, P.N., McGill Univ.:
Middle Devonian stromatoporoids from Yukon Territory, 1966-67;
M.Sc. thesis.
613. Mott, R.J., Geol. Surv. Can.:
Palynological studies in central Saskatchewan, 1965.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 122-123.
614. Nassichuk, W.W., Geol. Surv. Can.:
Permian ammonoids from subsurface Belloy Formation, north-eastern British Columbia, 1966.

615. North, B.R., Caldwell, W.G.E., Univ. of Saskatchewan:
Foraminiferal biostratigraphy of the Cretaceous System in
Saskatchewan.
616. Petracca, A.N., British American Oil Co., Calgary:
Tertiary and Mesozoic foraminifera from Western and Northern
Canada.
617. Petryk, A.A., Geol. Surv. Can.:
Mississippian foraminifera of southwestern Alberta, 1966-67;
Ph.D. thesis.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 105.
618. Riva, J., Université Laval:
Middle and Upper Ordovician graptolites of the St. Lawrence
Lowlands, Island of Anticosti, Lake St. John area, Quebec
and the Mohawk Valley, New York, 1961-.
See Upper Lévis graptolites from Cowansville, southern
Quebec; Jour. Pal., vol. 40, pp. 220-221, 1966.
619. Russell, L.S., Royal Ontario Museum:
Cretaceous mammals of Alberta, 1964-68.
Involves collecting from known localities and a search for
mammalian fossils in older formations. See Cretaceous mammals
of Alberta; National Museum of Canada, Bull. 126, pp. 110-119,
1952.
Tertiary mammals of Saskatchewan, 1948-.
Current work is on the Oligocene fauna, but this has to be
reorganized to include the collection of the Saskatchewan Museum
of Natural History, recently made available. See Tertiary
mammals of Saskatchewan Part I: The Eocene fauna; Royal
Ontario Museum, Life Sci. Contrib. 67, 33 pp., 7 pls., 1965.
Palaeontology of the Swan Hills area, north-central Alberta,
1964-67.
Description of the Palaeocene mammals, fishes, mollusks
and plants, and the Cretaceous reptiles; delineation of the
Cretaceous-Tertiary boundary.
Correlation of Cretaceous and Tertiary formations of southern
Saskatchewan and Alberta with those of northern Montana,
1965-68.
A number of discrepancies in the accepted correlation of
Cretaceous and Tertiary formations across the International
Boundary will be investigated, mainly by the collecting and iden-
tification of fossils from critical horizons in both Canada and the
United States. See Cretaceous non-marine faunas of northwestern
North America, Royal Ontario Museum, Life Sci. Contrib. 61,
24 pp., 1964.

620. Srivastava, S.K., Univ. of Alberta:
Palynology of Upper Cretaceous vertebrate beds, 1964-67; Ph.D. thesis.
The quarries yielding microvertebrate and macrovertebrate fossils in the Edmonton-Belly River sequence of Alberta are being sampled and analyzed for palynological control with an ultimate view to establishing the synchronicity or non-synchronicity of dinosaur extinction. See Palynology of Late Cretaceous Mammal beds, Scollard, Alberta, Canada; Palaeogeography, Palaeoclimatology, Palaeoecology, vol. 3, No. 1, Elsevier Publ. Co., Amsterdam, 1967.
621. Srivastava, S.K., Binda, P.L., Univ. of Alberta:
Investigation of silicified megaspores, 1966-67; Ph.D. thesis.
622. Stearn, C.W., McGill Univ.:
Stromatoporoid faunas of Canada, 1956-.
The specific problem under investigation at the moment is the palaeoecologic zonation on the basis of stromatoporoids of the south flank of the Ancient Wall Reef in Jasper National Park. Field trips to this area for collecting were made in 1964 and 1966. See Microstructure of stromatoporoids; Palaeontology, vol. 9, pp. 74-124, 1966.
623. Steele, M., Geol. Surv. Can.:
Ordovician palaeontology, Renfrew, Ontario, 1966.
624. Thusu, B., Univ. of Alberta:
Palynology of the Dunvegan Formation, 1965-67; M.Sc. thesis.
625. Uffen, R.J., Univ. of Western Ontario:
Palaeobiophysics, 1962-66.
There is good evidence that reversals in the earth's magnetic field have had an influence on the development of biological species.
626. Uyeno, T.T., Geol. Surv. Can.:
Biostratigraphic study of Lower and Middle Devonian conodonts of southwestern Ontario and James Bay Lowlands, 1967-.
627. Verma, H., McMaster Univ.:
A taxonomic study of the Triassic pelecypods from northeast British Columbia, 1965-67; M.Sc. thesis.
A detailed study of the fauna from the Grayling, Toad and Liard Formations, lower and middle Triassic, exposed in the Tetsa Valley along the Alaska Highway is being undertaken. Associated with this work is a re-investigation of the Norian Monotis fauna from Pine River Bridge section, B.C.

628. Vicencio, R., McMaster Univ.:
A taxonomic and biostratigraphic study of Middle Jurassic ammonites from localities in the Andes of Argentina and Chile, 1966-.
629. Walton, H.S., Chevron Standard Ltd., Calgary:
Palynological studies of the Palaeozoic of Western Canada.
630. Waterhouse, J.B., Univ. of Toronto:
New Zealand Permian Pectens, 1962-67.
See Etheripecten, a new Aviculopectinid from New Zealand; N.Z. J. Geol. Geophys. 6, pp. 193-196.
Basal Triassic faunas of New Zealand, and their relationship to other faunas of the Pacific, 1960-68.
See A new stage for the basal Triassic of New Zealand; N.Z. J. Geol. Geophys. 8, pp. 1258-1259.
Revision of type species of brachiopod Notospirifer, 1963-66.
See The Permian Spiriferoid genus bikella Sahni and Srivastava (1956) and its relationship to Ingelarella Campbell (1959) and Martiniopsis Waagen (1883); Trans. Roy. Soc. N.Z. 3, (12), pp. 159-170, 1965.
Permian faunas of southern Asia; Silicified Permian fauna from the tin-bearing limestones of southern Thailand, 1966-67.
A new and exceptionally well preserved fauna. See Permian and Lower Carboniferous Brachiopods from Nepal; Geol. Bundesanstalt Wien Jahrb 12, pp. 5-105.
631. Weihmann, British American Oil Co., Calgary:
Palaeozoic microfossils, especially Devonian ostracod and conodont assemblages with respect to interpretation of depositional environments.
632. Westermann, G.E.G., McMaster Univ.:
The ammonoid fauna of the Kialagvik Formation of Wide Bay, Alaska Peninsula, in particular, the S. sowerbyi zone, 1964-.
633. Winder, C.G., Univ. of Western Ontario:
Micropaleontology of the Devonian, southwestern Ontario.
See Conodont distribution and stratigraphic variability of Upper Devonian, Southwestern Ontario: Journal of Paleontology, November issue, 1966.
634. Ying-Chi, Hsu, Memorial Univ. of Newfoundland:
Newfoundland Precambrian fossils, 1966-68; M.Sc. thesis.

PETROLOGY AND PETROGRAPHY

Alberta

635. Wynne-Edwards, H.R., Pearce, T.H., Queen's Univ.:
Chemistry and petrology of the Crowsnest volcanic formation,
1963-67; Ph.D. thesis (Pearce).
A mineralogical and chemical study of the Crowsnest formation and the minerals within it. The investigation has included field mapping, petrographic and chemical analysis, hydrothermal investigations, and microprobe studies of sanidine and analcite.

British Columbia

636. Giovanella, C.A., Geol. Surv. Can.:
Metamorphism of gneisses, Rocky Mountain Trench, British Columbia, 1966-; Ph. D. thesis.
See Geol. Surv. Can. Paper 67-1A, 1967, pp. 60-62.
637. Lambert, M.B., Carleton Univ.:
Petrology of the MacAuley Creek igneous complex,
British Columbia-Yukon Territory, 1966-68;
Ph.D. thesis (Lambert).
The complex is believed to be a Tertiary cauldron subsidence structure, occupied mainly by salic tuffs, ignimbrites, and breccias. The study will emphasize structure and petrology of the complex, and its relation to the enclosing plutonic rocks of the Coast Range.
638. Moore, J.M. Jr., Carleton Univ.:
Petrology of the Thor-Odin gneiss dome, Monashee Mountains, British Columbia, 1963-68.
Study of petrology and zoning in upper amphibolite facies metasedimentary and granitoid rocks of the Shuswap Terrane, in cooperation with J.E. Reesor and E. Froese, Geological Survey.
639. Preto, V.A.G., McGill Univ.
Structure and petrography of the Grand Forks Group, British Columbia, 1965-67; Ph.D. thesis.
640. Reesor, J.E., Blattner, P., Geol. Sur. Can.:
Thor-odin gneiss dome, west upper Arrow Lake, British Columbia, 1964-65.
See Geol. Surv. Can., Paper 66-1, 1966, pp. 78-80, Paper 66-2, 1966, pp. 44-48.

641. Richards, T., McGill Univ.:
The Chilliwack batholith, British Columbia, 1966-68; Ph.D. thesis.
642. Souther, J.G., Geol. Surv. Can.:
Telegraph Creek, British Columbia, 1 inch to 1 mile, 1956-66.
Study of recent volcanic centres and their relation to regional tectonics. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 89-92.

Manitoba

643. McRitchie, W.D., Manitoba Mines Branch:
Rice Lake-Beresford Lake region, southeastern Manitoba, 1965-71 (Project Pioneer).
Includes studies of metamorphism, petrography and structure of Precambrian paragneisses, and associated granites and amphibolites; carbonate wall rock alteration associated with gold veins in diabases and volcanics; petrology of quartz feldspar porphyry dykes injected into volcanics.
644. Paulus, G.E., Univ. of Manitoba:
Mineralogy and petrography of an igneous intrusion, Rice Lake area, Manitoba, 1966-67; M.Sc. thesis.
645. Quaraishi, A.A., Univ. of Manitoba:
Mineralogy and petrography of an igneous intrusion, Flin Flon area, Manitoba, 1965-67; M.Sc. thesis.
646. Ray, P.S., McMaster Univ.:
Study of granodiorites of the Reynolds Lake pluton near Flin Flon, Manitoba, 1966-; M.Sc. thesis.
647. Scoates, R.F.J., Manitoba Mines Branch:
Petrology, geochemistry and petrogenesis of mafic and ultramafic rocks and related sulphides and feldspar porphyry dykes of the Rice Lake-Beresford Lake area, southeastern Manitoba, 1966-71 (Project Pioneer).
648. Weber, W., Manitoba Mines Branch:
Rice Lake-Beresford Lake region, southeastern Manitoba, 1966-71 (Project Pioneer).
Includes study of the petrology, metamorphism, structure of Precambrian gneisses, acid and basic intrusions, volcanics, and sediments and their age-relationships.

New Brunswick

649. Trembath, L. T., Univ. of New Brunswick:
Zeolites in the Triassic basalts of Grand Manan, New Brunswick,
1965-67.
Determination of assemblages in a series of sills and flows
combined with an attempt to relate the assemblages to the rock
composition and the geologic environment.
650. Williamson, D.H., Laurentian Univ. of Sudbury:
Bulk chemical analyses of rocks from Caledonia Mountain,
southeastern New Brunswick, 1966-68.
An attempt is being made to correlate the numerous plu-
tons within the study area by establishing a procedure for the
bulk chemical analyses of samples by X-ray fluorescence
methods.
Crystal structure studies of feldspars from Caledonia Mountain,
southeastern New Brunswick, 1966-68.
Crystal structure studies of feldspars are being under-
taken in an attempt to establish the kind of relationship existing
between chemical and physical data and the origin and para-
genesis of the feldspars in the plutonic and associated metamor-
phic rocks of Southern New Brunswick.

Newfoundland and Labrador

651. Emslie, R.F., Wares, R., Geol. Surv. Can.:
Michikamau anorthosite intrusion, Labrador, 1966-; M.Sc.
thesis (Wares).
See Geol. Surv. Can., Paper 67-1A, 1967, p. 193.
652. Fleming, J.M., Papezik, V.S., Memorial Univ. of Newfoundland:
Petrology of the Whalesback Mine near Springdale,
Newfoundland, 1964-67; M.Sc. thesis (Fleming).
Detailed petrology of Ordovician volcanic rocks, the host-
rocks of copper mineralization in the Whalesback mine.
653. Hughes, C.J., Memorial Univ. of Newfoundland:
Petrology of Harbour Main volcanics (Avalon Peninsula),
Newfoundland, 1966-.
654. Papezik, V.S., Memorial Univ. of Newfoundland:
Mineralogy and petrology of granitic and volcanic rocks on the
Avalon Peninsula, Newfoundland, 1963-.

Detailed study of Precambrian igneous rocks including andesite, rhyolite, welded tuffs and a hybrid upper part of a granitic batholith.

Northwest Territories and Yukon

655. Baragar, W.R.A., Geol. Surv. Can.:
Volcanic studies - coppermine River Group, Northwest Territories, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 26-28.
656. Findlay, D.C., Geol. Surv. Can.:
Ultramafic rocks, Yukon Territory, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 47.
657. Frisch, T., Geol. Surv. Can. (part time):
Igneous and metamorphic rocks, north Ellesmere Island, Northwest Territories, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 7.
658. Giguère, J., Univ. of Ottawa:
Distribution of elements among coexisting pyroxenes of high-grade metamorphic rocks from Somerset Island, Northwest Territories, 1965-67; M.Sc. thesis.
659. Gray, N.H., McGill Univ.:
Crystallization of the Kigaviavluk dyke, Northwest Territories, 1966-67; M.Sc. thesis.
660. Gray, N.H., Forester, R., McGill Univ.:
Geology and petrology of McBeth Fiord, Baffin Island, 1965-.
661. Heywood, W.W., Davidson, A., Geol. Surv. Can.:
Study of sedimentary and volcanic rocks of Ennadai-Rankin belt; Northwest Territories, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 19-22.
662. Johnson, A., Burwash, R.A., Univ. of Alberta:
Petrology of a gabbro-syenite dyke, Simpson Island, Great Slave Lake, Northwest Territories, 1964-67; M.Sc. thesis (Johnson).

Nova Scotia

663. Friedlaender, C.G.I., Dalhousie Univ.:
Mineralogical and petrographical studies, Nova Scotia, 1962-.
664. MacNeill, R.H., Acadia Univ. and Nova Scotia Research Council:
Mafic dykes in King's county, Nova Scotia, 1963-.
An attempt to correlate the dykes with Triassic tholeiite flows.
665. Stevens, G.R., Acadia Univ.:
Primary fabric, structures and petrology of Triassic basalt flows, Bay of Fundy shore, Nova Scotia, 1966-.
An attempt to relate fabric, structures and petrologic variations to flow and emplacement directions of Triassic basalts and possible feeder dykes and vents; design of hypersonic device to detect fabric or preferred orientation in basalt by means of selective absorption; eventual application of such techniques to flow-fabric of Devonian granites.

Ontario

666. Appleyard, E.C., Univ. of Waterloo:
Mineralogy, petrology and geochemistry of nepheline gneisses of the Wolfe Belt, Lyndoch township, Ontario, 1958-68.
See Nepheline gneisses of the Wolfe Belt, Lyndoch township, Ontario, Pt. I. Canad. Jour. Earth Sci., in press.
Geology of the area around Dønnesfjord, Sørøy, north Norway, with emphasis on metasomatic phenomena, 1963-68.
See A preliminary description of the geology of the Dønnesfjord area, Sørøy. Norges Geologiske Undersøkelse, nr. 231, 1965, p. 143.
Syn-orogenic alkaline rocks of eastern Ontario; their petrography, mineralogy, geochemistry, structural setting, age and genesis, and their relation to the Grenville orogeny in time and space, 1966-.
667. Church, W.R., Univ. of Western Ontario:
Nipissing diabases of the Penokean fold belt, Ontario, 1966-.
668. Coates, M.E., McGill Univ.:
Geology of the Killala Lake igneous complex, District of Thunder Bay, Ontario, 1966-67; M.Sc. thesis.

669. Grieve, R.A., Gittins, J., Univ. of Toronto:
Petrology of a basic ultrabasic complex in Monmouth township, Ontario, 1966-68; M.Sc. thesis (Grieve).
Gabbros of very late Grenville age appear to be cut by peridotite dykes. The complex contains gabbro, olivine gabbro and pyroxenite; it displays slight thermal metamorphism throughout and regional metamorphism in the outer hundred feet or so.
670. Henderson, J.R., McMaster Univ.:
The structural and metamorphic history of the boundary between the Grenville and Southern structural provinces in an area southeast of Sudbury, Ontario, 1963-67; Ph.D. thesis.
671. Jennings, D.S., McMaster Univ.:
Origin and geochemistry of part of the Hermon Formation near Bancroft, Ontario, 1964-68; Ph.D. thesis.
An attempt to determine the protoliths of the various units in the Hermon Formation, Grenville-type metasediments of upper almandine amphibolite grade in the Hastings lowlands of northern Ontario; includes an integrated study of stratigraphic relationships, whole rock analyses fitted to depositional models, zircon morphology studies and transition metal trends.
672. Kretschmar, U., McMaster Univ.:
Determination of oxygen fugacity and temperature of formation of an anorthosite near Parry Sound, Ontario, 1966-68; M.Sc. thesis.
A trace element analysis and electron probe study of oxides from an anorthosite is being undertaken with a view to determining the oxygen fugacity and temperature of formation.
673. Kwak, T.A.P., McMaster Univ.:
Metamorphic geology of an area on the Grenville Front, 1964-68; Ph.D. thesis.
Study of an area ten miles southeast of Sudbury to elucidate the metamorphic and structural history of the Grenville Front.
674. Moore, J.M. Jr., Sethuraman, K., Carleton Univ.:
Petrology and structure of metasedimentary and metavolcanic rocks, Barrie-Clarendon area, southeastern Ontario, 1966-68; Ph.D. thesis (Sethuraman).
The objects are to establish structure, metamorphic zoning, and, in the lower-grade (greenschist-low amphibolite) rocks, the stratigraphy.

675. Moorhouse, W.W., Jen, Lo-Sun, Univ. of Toronto:
Studies of certain basic rocks, 1963-69; Ph.D. thesis (Jen).
The "quartz diorite" or mafic norite of the north range, Sudbury
irruptive, contains a variety of peculiar inclusions, which provide
an interesting side-light into the nature of the irruptive. A great
deal of petrographic work has been done on the rock and its inclu-
sions by Vos and Moorhouse, and it is proposed to amplify this with
chemical and possibly probe studies in the current thesis project.
It is hoped, by means of the chemical studies of inclusions, to
determine if they fit into the pattern of alkali-Fe-Mg variations of
normal differentiated layered basic intrusions. See Quartz diorites
from the North Range, Sudbury (Abstract); Can. Mineralogist, vol.
8, pt. 3, p. 402, 1965.
676. Payne, J.G., McMaster Univ.:
Geological and geochemical study of the French River alkali syenite
body, 1966-.
Includes field mapping, thin section petrography, and spectro-
chemical analyses, with a view to determining the origin of neph-
eline syenite.
677. Rambaldi, E., Smith, M.E., Univ. of Ottawa:
Distribution of elements among coexisting feldspars of metamorphic
rocks from the Madoc area, Ontario, 1965-68; Ph.D. thesis
(Rambaldi).
678. Stevenson, J.S., McGill Univ.:
Comprehensive petrological and mineralogical study of the Sudbury
Basin Irruptive, Ontario, 1951-.
See Sudbury in terms of Upper-Mantle Petrology; Proceedings of
the Geol. Soc. Amer., 1965, p. 18.
679. Wenban-Smith, A., Gittins, J., Univ. of Toronto:
Petrology of part of the Glamorgan gabbro, Glamorgan township,
Ontario, 1965-68; M.Sc. thesis (Wenban-Smith).
Parts of the gabbro do not appear to have been affected greatly
by the Grenville metamorphism. Textures are igneous but some
recrystallization due to thermal effects can be traced.
680. Wynne-Edwards, H.R., Ermanovics, I.F., Queen's Univ.:
Petrogenesis of the Perth Road syenite, Ontario, 1964-67.
A geochemical and petrological study of a syenite body supported
by detailed field work. See Gananoque map-area, Ontario; Geol.
Surv. Can. Map 27-1962, with descriptive notes.

681. Wynne-Edwards, H.R., Fletcher, C.J.N., Queen's Univ.:
Local equilibrium in amphibolite from Parham, Ontario, 1966-67;
M.Sc. thesis (Fletcher).
Electron-probe investigation of the variations in chemical composition of minerals in small area of a layered amphibole-pyroxene gneiss.
682. Wynne-Edwards, H.R., Jen, Lo-Sun, Queen's Univ.:
Distribution of elements in metamorphic rocks - IV; Petrochemistry of amphibolites from the Tichborne-Westport area, Ontario, 1964-67; M.Sc. thesis (Jen).
Distribution of elements in coexisting hornblende, biotite, hypersthene, and salite in mafic gneisses from the Frontenac Axis. This study is complimentary to those of Wynne-Edwards and Hay, Reinhardt, and M.E. Smith which have already been reported. See Coexisting cordierite and garnet in regionally metamorphosed rocks from the Westport area, Ontario; Canadian Mineralogist, 7, pt. 3, pp. 453-478.
683. Wynne-Edwards, H.R., Sauerbrei, J.A., Queen's Univ.:
Granitic rocks of the Frontenac Axis, Ontario, 1956-66; M.Sc. thesis (Sauerbrei).
A geochemical investigation and a mineralogical classification of the granitic rocks of the Frontenac Axis in the Grenville province, with a discussion of their relationship to each other and to the enclosing gneisses.

Quebec

684. Ahmedali, S.T., McGill Univ.:
Anorthosites and associated rocks, Sept-Iles and Rivière Pentecôte area, Quebec, 1965-67; Ph.D. thesis.
685. Allard, G.O., Quebec Dept. of Natural Resources (part time), Univ. of Georgia:
Northwest quarter of Rinfret township, Abitibi-East county, Quebec; 1,000 feet to 1 inch, 1966-68.
Includes study of the well layered and differentiated gabbroic sill known as the Doré Lake Complex.
686. Armstrong, C.W., Hutchinson, R.W., Edgar, A.D., Univ. of Western Ontario:
Comparative studies of lithium-bearing pegmatites, 1965-68; Ph.D. thesis (Armstrong).

A study of the mineralogy, chemistry and field relationships of zoned lithium pegmatites with particular reference to the pegmatites from Val d'Or, Quebec.

687. Béland, J., Martignole, J., Hocq, M., Université de Montréal:
Structural and petrological study of the Grenville rocks exposed in the Shawinigan area, Quebec, 1964-68; M.Sc. thesis (Hocq).
This study is aimed at clarifying the mode of emplacement of the anorthosite-mangerite complexes from a structural viewpoint. An attempt is made to relate deformation, crystallization, recrystallization in time.
688. Chyi, L.L., McMaster Univ.:
Precious metal geochemistry of ultra-basic rocks from Mt. Albert, Quebec, 1966-68; M.Sc. thesis.
Neutron activation analysis for gold, palladium, iridium, osmium and ruthenium in olivine, enstatite, clinopyroxene, chromite and serpentized samples from Mt. Albert, Quebec. The data will be used to determine the fractionation trends of precious metals during crystallization of an ultrabasic rock.
689. Currie, K.L., Geol. Surv. Can.:
Manicouagan crater, Quebec, 1963-65.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 165.
690. De, A., Geol. Surv. Can. (N.R.C. Postdoctorate Fellow):
Post-ultramafic dykes in the asbestos mining areas of the Eastern Townships, Quebec, 1966-67.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 165-166.
691. Forester, R., McGill Univ.:
The Petrology of the Bon Conseil Monteregean Intrusive, Quebec, 1965-67; M.Sc. thesis.
A study of a hypabyssal alkaline intrusive suite, comprised of a hornblende-biotite, peridotite, and analcime-bearing pyroxenite, gabbro, and syenite. A Rb-Sr age determination on the biotite from the peridotite has confirmed a Monteregean age.
692. Gandhi, S., McGill Univ.
Igneous petrology of Mt. Yamaska, Quebec, 1962-67; Ph.D. thesis.
693. Gélinas, L., Ecole Polytechnique, Université de Montréal:
Etude géochimique des métagabbros, amphibolites et schistes pélitiques des régions des lacs Thévenet, Gabriel et Fort-Chimo, Nouveau-Québec, 1966-68.

Cette étude porte sur l'évolution des assemblages minéralogiques des schistes pélitiques et des roches méta-éruptives mafiques et ultramafiques en fonction de l'accroissement du métamorphisme. La représentation graphique de ces assemblages met en évidence leur état d'équilibre.

694. Gillain, P.R., McGill Univ.:
Dykes and sills in the Canada cement quarry, Montreal, Quebec, 1964-67; M.Sc. thesis.
695. Greig, S., McGill Univ.:
Petrological study of rocks on Rigaud Mountain, Quebec, 1967-68; M.Sc. thesis.
696. Grove, E.W., McGill Univ.:
Petrochemical and structural studies, Lake Miquelon, Quebec, 1963-67; Ph.D. thesis.
697. Hardy, R., Ecole Polytechnique, Université de Montréal:
Assemblage minéralogique des méta-gabbros de la région du lac des Chefs, Nouveau-Québec, 1966-67; thèse de maîtrise.
698. Hodgson, C.J., McGill Univ.:
Monteregian dyke rocks, Quebec, 1965-68; Ph.D. thesis.
699. Hogarth, D.D., Univ. of Ottawa:
Mineralogy, petrology and structure of Grenville rocks, Quebec, 1959-.
700. Ledoux, R.L., Sabourin, R., Cimon, J., Université Laval:
Formation of kaolin minerals from anorthosite at Chateau Richer, Quebec, 1965-68; M.Sc. thesis (Cimon).
An investigation of the nature of the kaolin minerals, their hydration and dehydration behaviour, the ordering of their structure, and their genesis.
701. Mahaffy, D.F., McGill Univ.:
Blotchy gabbro of the Hopes Advance Bay area, Quebec, 1966-67; M.Sc. thesis.
702. Pattison, E.F., McGill Univ.:
Alkaline rocks of Brome Mountain, Quebec, 1966-68; Ph.D. thesis.
703. Rajasekaran, K.C., McGill Univ.:
The mineralogy and petrology of the nepheline syenite rocks, Mount St. Hilaire, Quebec, 1964-67; Ph.D. thesis.

704. Robillard, J., Ecole Polytechnique, Université de Montréal:
Etude pétrologique du Mont-Royal, 1965-67; thèse de maîtrise.
705. Sabourin, R., Ledoux, R.L., Université Laval:
Kaolinization of an anorthosite near Chateau-Richer, Quebec,
1965-67.
706. Sauvé, P., Quebec Dept. of Natural Resources (part time), Université
Laval:
Petrology and metallogeny of a gabbro sill near Gerido Lake, New-
Quebec, 1966-.
707. Schryver, K., McGill Univ.:
Study of the Lac Croche metamorphosed pluton, Quebec, 1961- ;
Ph.D. thesis.
708. Van Ingen, R., McGill Univ.:
A study of the granite masses near Weedon and Megantic, Quebec,
1963-67; Ph.D. thesis.
709. Woussen, G., Université de Montréal:
Etude de la syénite du Mont-Royal, avec étude sommaire de dyke
et de la brèche, 1966-67; thèse de maîtrise.
710. Wynne-Edwards, H.R., Queen's Univ., Jacoby, R.S., Quebec Dept.
of Natural Resources:
The origin of the microperthite gneisses and their relations to other
quartzo feldspathic gneisses of the Baskatong Lake map-area,
Quebec, 1965-67; Ph.D. thesis (Jacoby).
Detailed petrological and structural investigation of tectonic
relationships in an area in southwestern Quebec. See Mont Laurier
and Kempt Lake map-areas, Quebec (a preliminary report of the
Grenville Project); Geol. Surv. Can., Paper 66-32, Map 11-1966,
32 pp., 1966.
711. Wynne-Edwards, H.R., Queen's Univ., Kehlenbeck, M.M., Quebec
Dept. of Natural Resources:
Lac Rouvray gneiss complex and surrounding anorthositic rocks,
1966-68; Ph.D. thesis (Kehlenbeck).
A study of the tectonic setting and crystallization history of an
anorthosite mass within the Grenville province of Quebec.
712. Wynne-Edwards, H.R., Wares, R., Queen's Univ., Emslie, R.F.,
Geol. Surv. Can.:
Petrology of part of the Michikaman anorthosite intrusion, Quebec,
1966-67; M.Sc. thesis (Wares).

Includes electronprobe study of plagioclase in relation to its distribution within the mass and the composition of the coexisting minerals. See The Michikaman anorthosite intrusion, Labrador; Can. J. Earth Sci., vol. 2, pp. 385-399.

General Problems

713. Bérard, J., Ecole Polytechnique, Université de Montréal:
Péetrographie des agrégats et des bétons à ciment Portland, 1965-.
714. Brisbin, W.C., Univ. of Manitoba, and Turek, A.C., Haugh, I.,
Scoates, R.F.J., Manitoba Mines Branch:
Development of computer treatment methods for field observations
and programming for their retrieval, decoding and plotting
(Project Pioneer).
715. Church, W.R., Univ. of Western Ontario:
Ariegites, 1965-.
716. Clark, G.S., Univ. of Manitoba:
Rubidium-strontium isotopic investigation of alkaline intrusions in
the Superior Province of the Canadian Shield.
Field and laboratory work is awaiting completion of a mass
spectrometer for the isotope studies. The mass spectrometer will
be a 10-inch radius, 90 degree sector magnet, solid-source
instrument.
717. Clifford, P.M., McMaster Univ.:
Structural and metamorphic development in a "Keewatin" green-
stone belt, 1966-.
Analysis of abundant field data indicates triple folding of a
stratovolcanic pile and its associated sediments, coupled with
highly variable regional metamorphism and contact metamorphism.
718. De Vries, C., Edgar, A.D., Univ. of Western Ontario:
Compositions of coexisting nephelines and feldspars from alkaline
rocks of the gabbroic and syenitic types, 1966-67.
719. Edgar, A.D., Mottana, A., Univ. of Western Ontario:
Geochemistry of eclogites, 1966-70.
Involves investigations of certain actual reactions pertinent to
eclogites under conditions of high temperature and pressure; melt-
ing relationships in eclogites and associated rocks; crystallography
of omphacites.

720. Edgar, A.D., Piotrowski, J.M., Sood, M.K., Univ. of Western Ontario:
Melting relations in alkaline rocks, 1964-68; Ph.D. thesis (Piotrowski), M.Sc. thesis (Sood).
Melting studies and sequences of crystallization of selected alkaline rocks at pressures up to 2 kilobars PH_2O ; correlation of melting sequences with observed paragenesis and with the chemistry of the rocks has been made. See Melting relations in alkaline rocks, Paper presented to annual M.A.C. meeting, Halifax, 1966.
721. Erdosh, G., McGill Univ.:
Modal analysis of rocks by instrumental techniques, 1965-67; Ph.D. thesis.
At present the only practical way to obtain the mode of a rock is by point counting. This project was undertaken to devise an instrumental method by which the mode of a rock can be routinely determined by a technician. Infrared absorption spectroscopy and X-ray powder diffraction were critically evaluated for the purpose. The latter was found to be more suitable and, combined with heavy liquid separation, it gives a satisfactory quantitative mineralogical analysis of most rocks. The time required for the analysis is comparable to that of point counting. Investigations on accuracy and reproducibility are under way.
722. Fahrig, W.F., Geol. Surv. Can.:
Diabase dykes of Canadian Shield, 1961-.
See Geol. Surv. Can., Paper 66-1, 1966, pp. 186-187 and Paper 67-1A, 1967, p. 217.
723. Fawcett, J.J., Univ. of Toronto:
Chemical reactions involved in low grade metamorphic rocks, 1964-.
See The phase relations of chlorites in the system $\text{MgO-Al}_2\text{O}_3\text{-SiO}_2\text{-H}_2\text{O}$; American Mineralogist, Mar.-Apr. 1966.
724. Fawcett, J.J., Rucklidge, J.C., Univ. of Toronto:
Mineralogy and chemistry of basalt lavas, 1965-.
See Geological expedition to the Tertiary basalt region of Scoresby Sand, East Greenland; Nature, Nov. 1966.
725. Gale, G., Newfoundland Dept. of Mines, Agriculture and Resources:
Pegmatites survey, 1964-67; M.Sc. thesis.
Involves geological mapping, thin section and X-ray study, chemical analysis and economic appraisal.

726. Gibb, F.G.F., Fawcett, J.J., Univ. of Toronto:
Melting relations of basic and ultrabasic rocks, 1966-68.
727. Gittins, J., Univ. of Toronto:
Studies of carbonatite petrogenesis, 1959-.
Phase equilibrium systems related to the origin and physical emplacement of carbonatite magmas; petrological studies of carbonatite complexes and their mineralogy. See Carbonatites; eds. J. Gittins, O.F. Tuttle, Wiley-Interscience, London, 1966.
728. Gittins, J., York, D., Univ. of Toronto:
Ages of alkaline rocks and carbonatites in Eastern Canada, 1964-67.
A systematic study of the age distribution of carbonatite and feldspathoidal magmatism in Ontario and Quebec suggests four ages at 100-125 m.y., 560 m.y., 1,000 m.y., and 1,700 m.y. Carbonatites of both 1,000 m.y. and 1,700 m.y. ages occur widely in the Superior Province. See The ages of carbonatite complexes in Eastern Canada; Can. Jour. Earth Sciences, in press.
The $\text{Sr}^{87/86}$ ratio of metamorphosed limestones, 1963-66.
See The significance of Sr isotope ratios in theories of carbonatite genesis; Nature, vol. 207, pp. 625-626, 1965.
729. Gross, W.H., Univ. of Toronto:
The composition of some serpentinites in Eastern North America, 1965-67.
Approximately 100 samples from locations stretching from Alabama to northern Ontario are being analyzed.
730. Gunn, B.M., Université de Montréal:
Geochemistry of Rattlesnake Syenogabbro, 1966-67.
Geochemistry of Guadalajara volcanics, 1966-67.
Computer solution of matrix effects in X-ray spectrometry, 1966-67.
731. Harriss, R.C., McMaster Univ.:
Chemical weathering of volcanic rocks from Puerto Rico, 1966-.
Study of mineralogical and chemical transformations related to the weathering of volcanic rocks in a tropical environment.
732. Houghton, D.R., McMaster Univ.:
Investigation of calcium concentration in coexisting plagioclase and scapolite, 1965-67; M.Sc. thesis.
Analysis with the electron microprobe to elucidate some of the petrology of scapolite. Studies are in hand on specimens from areas of low grade regional metamorphism, skarn deposits, and an anorthosite.

733. Irvine, T.N., Geol. Surv. Can.:
Investigation of nomenclature and classification of volcanic rocks,
1966-67.
734. Kretz, R., Univ. of Ottawa:
Study of metamorphic rocks, 1955-.
See Grain-size distribution for certain metamorphic minerals
in relation to nucleation and growth; Jour. Geol., vol. 74,
pp. 147-173, 1966.
735. Mason, I.M., McMaster Univ.:
Study of the Hagerman anorthosite and surrounding rocks,
1963-67; Ph.D. thesis.
Includes structural, textural and mineralogical studies.
736. Maxwell, J.A., Geol. Surv. Can.:
Investigation of field sampling errors, 1965-67.
To determine magnitude of error in composition of replicate
samples taken in the field for subsequent compositional analysis.
737. Peach, P.A., Univ. of Toronto:
A study of Grenville granites, 1965-68.
The study is designed to show the relationship between the
ages of some Grenville intrusives, satellite intrusives and wall-
rocks and the composition of the intrusive.
738. Roeder, P.L., Hill, R., Queen's Univ.:
The role of oxygen fugacity in the crystallization of basic igneous
rocks, 1962-; Ph.D. thesis (Hill).
See Experimental data for the system $\text{MgO-FeO-Fe}_2\text{O}_3\text{-CaAl}_2\text{Si}_2\text{O}_8\text{-SiO}_2$ and their petrologic implications; Am. J. Sci.,
vol. 264, pp. 428-480, 1966.
739. Schwarcz, H.P., McMaster Univ.:
Study of $\text{U}^{234}/\text{U}^{238}$ activity ratio in tektites.
Use of functional relation between two or more trace element
abundances to determine whether a given metamorphic rock
type is of metasedimentary or meta-igneous origin.
Crystal field stabilization energy as a factor in determining trace
transition element partitioning between coexisting metamor-
phic minerals.
Study of the origin of charnockites.
740. Skippen, G.B., Carleton Univ.:
An experimental study of the metamorphism of carbonate rocks,
1967-69.

Involves the measurement of equilibrium constants for reactions occurring among the phases quartz, calcite, dolomite, talc, tremolite, diopside, forsterite, wollastonite and enstatite. See Igneous and metamorphic reactions involving gas equilibria, in P.H. Abelson, ed., *Researches in Geochemistry*, vol. 2, New York, John Wiley and Sons.

741. Smith, C.H., and others, Geol. Surv. Can.:
Ultrabasic intrusions of Canada, 1957-.
742. Smith, D.G.W., Univ. of Alberta:
Pyrometamorphism of phyllites by a dolerite-plug, 1961-67.
See The chemistry and mineralogy of some emery-like rocks from Sithean Sluaigh, Strachur, Argyllshire; *Amer. Mineralogist*, 50, pp. 1982-2022, 1965.
Mineralogy of low-grade (chlorite zone) metamorphics of Loch Tyne area, Argyllshire, Scotland, 1965-68.
Petrology, geochemistry and vulcanology of Ascension Island, 1964-68.
See Oxford expedition to Ascension Island, 1964; *Nature*, 204, pp. 722-724, 1964.
743. Wilson, H.D.B., Univ. of Manitoba:
The igneous episodes in the Superior Province, Canadian Shield, 1964-.
The chemical nature of the principal igneous episodes is being determined by chemical analysis. Thus far, these include the Archaean lavas, the Kenoran granitic intrusions, the "Keeweenawan" diabases and lavas, the late syenitic-alkaline plugs, and the intrusions and lavas along the boundary of the province. See *Volcanic history of the Canadian Archaean Province*; International Symposium on Volcanology, New Zealand, 1965.

PLEISTOCENE AND GROUNDWATER

Alberta

744. Carlson, V.A., Research Council of Alberta:
Gravity exploration for a buried channel near High Prairie, Alberta.
A large, negative gravity anomaly has been found near High Prairie. It was thought to be connected with a deeply buried pre-glacial channel. Test drilling has been carried out to determine.

the accuracy of the gravity results and to determine the density of the bedrock and overburden materials encountered.

Bedrock-topography and sand-thickness maps of the Edmonton area, 1961-66.

A bedrock topography map of townships 49-55, ranges 20-27, W. 4th Meridian with 25-foot contours has been constructed using information from oil company shot-hole logs and other sources. A map of the thickness of sand encountered in the drift has also been constructed. See Bedrock topography and surficial aquifers of the Edmonton district, Alberta, Res. Coun. Alberta Rept. 66-3, 21 pages (in press).

Bedrock topography of the Drumheller map-area, 1966-68.

745. Clissold, R.J., Research Council of Alberta (part time):
Groundwater mapping in the Red Deer area, 1966-68; M.Sc. thesis.
746. Dreimanis, A., Univ. of Western Ontario:
Deposition of loess of Recent age at North Saskatchewan River crossing, Banff National Park, Alberta, 1965-67.
747. Dunn, D., Research Council of Alberta (part time):
Groundwater resources of the Stettler area, Alberta, 1965-67;
Ph.D. thesis.
Analysis of the hydrological parameters of the Edmonton Formation in the Stettler area from pump-test data; mapping of the bedrock topography from water-well and seismic-shot-hole data; hydrology of a buried channel aquifer in the area.
748. Gabert, G.M., Research Council of Alberta:
Bedrock topography of the Edson area, 1961-67.
Some buried glacial meltwater channels will also be defined on the bedrock-topography map.
Groundwater hydrology of the Edmonton area, 1963-68.
Groundwater hydrology of a buried channel aquifer near Devon, Alberta, 1965-67.
Location and evaluation of the groundwater potential for the buried channel.
749. Gabert, G.M., Antoniuk, D., Johansen, O., Research Council of Alberta:
Tabulation and publication of water-well data.
Data for townships 11-25 has been compiled and should be published early in 1967. See Water-well records, southern Alberta, townships 1 to 10, Res. Coun. Alberta.

750. Gabert, G.M., Vanden Berg, A., Research Council of Alberta:
Investigations of a water-table aquifer near Codogan, Alberta,
1966.
751. Geiger, K.W., Research Council of Alberta:
Bedrock topography of southwestern Alberta, 1962-66.
The publication contains a topographic map of the present
surface superimposed on a topographic map of the bedrock sur-
face at the scale of 1/250,000. An interpretation of the pre-
glacial drainage is made. See Bedrock topography of southwestern
Alberta, Res. Coun. Alberta Prelim. Rept. 1965, 14 pages.
Groundwater geology of Lethbridge and vicinity, 1963-67.
Bedrock topography of National Topographic System map-area
821, Alberta, 1964-66.
Groundwater conditions and changes near the Waterton Dam,
Alberta, 1964-67.
752. Green, R., Research Council of Alberta, Westgate, J.A.,
Tokarsky, O., Univ. of Alberta:
The preglacial Peace Valley and its deposits around the town of
Peace River, Alberta, 1966-68; M.Sc. thesis (Tokarsky).
753. Hills, L.V., Univ. of Calgary:
Palaeoecological study of an abandoned Oxbow Lake, Duffield,
Alberta, 1966-.
The deposits range from 10 to 32 feet thick and are contin-
uously exposed for 1,500 to 2,000 feet along the banks of the
present North Saskatchewan River. Two C¹⁴ dates from ten feet
above the base of the deposits yielded dates of about 7,600 to
8,000 B.P. It is the purpose of this research to establish the
palynological and faunal sequence and to attempt to evaluate the
changes observed in terms of palaeoecology and palaeoclimato-
logy.
754. Jones, J.F., Research Council of Alberta:
Geology and groundwater resources, Peace River district,
Alberta, 1961-66.
See Reconnaissance groundwater study, Swan Hills and
adjacent areas, Alberta, Res. Coun. Alberta Prelim. Rept.
62-5, 1962, 43 pages. A R.C.A. bulletin on the project is in
press.
755. Le Breton, E.G., Research Council of Alberta:
Groundwater geology and hydrology of the Lamont-Chipman area,
1963-66.
Regional groundwater reconnaissance survey of the Red Deer
map-area, 1966-69.

756. Le Breton, E.G., Vanden Berg, A., Research Council of Alberta:
Groundwater geology and hydrology of east-central Alberta,
1957-1966.
See Chemical analyses of groundwaters of east-central
Alberta, Res. Coun. Alberta Prelim. Rept. 65-5, 24 pp.
757. Lennox, D.H., Bukhari, A., Research Council of Alberta:
Geophysics in groundwater exploration, 1957-1966.
See A generalized method of numerical resistivity analysis,
Geophysics, vol. 31, No. 3, pp. 625-626.
758. Lennox, D.H., Carlson, V.A., Research Council of Alberta:
Geophysical exploration for buried valleys in an area north of Two
Hills, Alberta, 1961-66.
Extensive field data has been collected within the area of
about one township using three geophysical methods: Gravity,
Seismic and Resistivity. An evaluation of these three methods as
an aid in groundwater exploration was made using bore-hole
control.
The seismic method in exploring for buried channels near Stavely,
Alberta, 1958-67.
Extensive Research Council refraction seismic data in the
Stavely area has been compared with subsequent geologic control
in order to better establish the limitations of the method.
759. Ramsden, J., Univ. of Alberta:
Stratigraphic study of Pleistocene deposits in the Edmonton area,
Alberta, 1967-69; M.Sc. thesis.
760. Reimchen, T., Univ. of Alberta:
Stratigraphy and fauna of the Saskatchewan gravels in Alberta,
1966-68; M.Sc. thesis.
761. Roed, M.A., Research Council of Alberta:
Surficial geology of the Edson area (83-F), Alberta, 1964-67;
Ph.D. thesis, Univ. of Alberta.
Preliminary results serve to define two distinct advances of
Cordilleran glaciers and at least one advance of a continental
glacier. Tills of different origin and age can be identified in the
field on the basis of erratic composition, geomorphic expression
and detailed stratigraphy.
762. Rutter, N., Geol. Surv. Can.:
Surficial geology along the Bow Valley between the Kananaskis
River and Cochrane, Alberta.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 113.

763. Stalker, A.M., Geol. Surv. Can.:
Glacial geology studies in southern and central Alberta, 1965-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 113-114.
764. Stevenson, D.R., Research Council of Alberta:
An evaluation of the groundwater budget and its significance within the hydrologic balance for the Marmot Creek basin, 1964-68.
Measurement of the groundwater components of the hydrologic cycle and evaluation of the groundwater balance.
An evaluation of the groundwater budget and its significance within the hydrologic balance for the Streeter basin, 1964-68.
Measurement of the groundwater components of the hydrologic cycle and evaluation of the groundwater balance.
An evaluation of the groundwater budget and its significance within the hydrologic balance for the Lodgepole Pine basin, Alberta, 1966- .
An evaluation of the groundwater budget of the Cache Percotte and Whiskeyjack basins near Hinton, Alberta, 1966- .
To instrument and calibrate the groundwater phase of the hydrologic cycle and subsequently observe the effects of various forest cropping methods on the groundwater budget.
The hydrologic balance from a large prairie drainage basin in central Alberta, 1966-.
765. St. Onge, D.A., Geol. Surv. Can.:
Geomorphology and glacial geology studies in north-central Alberta, 1965-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 115-117.
766. Tokarsky, O., Research Council of Alberta:
Evaluation of groundwater potential in the Wapiti Formation south of Grande Prairie, 1965-66.
Surficial geology and groundwater resources of Grimshaw-Cardinal Lake area, 1965-67.
Groundwater potential in the Keg River area, 1966.
Surficial geology and groundwater prospects of Spirit River, Wanham area, Alberta, 1964-68; M.Sc. thesis, Univ. of Alberta.
767. Toth, J., Research Council of Alberta:
Development and investigation of methods to determine the groundwater regime in uninstrumented drainage basins, 1963-66.

See A theoretical analysis of groundwater flow in small drainage basins, J. Geophys. Res. 68, 16, 4795-4812, 1963. Investigations for groundwater for the town of Olds, central Alberta, 1964-66.

The investigations started as an emergency program for finding water for the town of 3,000 people. They developed, however, into a detailed survey of the groundwater resources of the area, proving a total safe yield of approximately 700 gallons per minute. The geology, water chemistry and groundwater flow systems have been studied also. See Groundwater geology, movement, chemistry, and resources near Olds, Alberta, Res. Coun. Alberta Bull. 17, 1966, 126 pp. Investigations for groundwater in the Three Hills area, central Alberta, 1965-67.

A program to obtain a detailed knowledge of the quantity, quality, and distribution of groundwater available and suitable for domestic, municipal, and agricultural uses and gathering of field information for basic research in hydrology.

768. Turner, W.R., Research Council of Alberta:

Investigations for groundwater in the Red Deer area, central Alberta, 1965-69.

A program to obtain detailed knowledge of the quantity, quality, and distribution of groundwater available and suitable for domestic, municipal, and agricultural uses and gathering of field information for basic research in hydrology.

Regional groundwater reconnaissance of the Drumheller map-area, 1966-69.

Quantitative study of groundwater resources of city of Red Deer and vicinity, 1966-68; M.Sc. thesis, Univ. of Alberta.

769. Vanden Berg, A., Research Council of Alberta:

Investigations of an alluvial aquifer south of Redcliff, Alberta, 1966-67.

Groundwater movement and groundwater chemistry in the Hand Hills-Bullpound Creek area, Alberta, 1963-67.

Includes detailed mapping of the chemical quality of the groundwater; mapping of groundwater discharge and recharge areas from surface indications and piezometric data; stratigraphy of the Edmonton and Paskapoo Formations from bore-hole data and bedrock exposures; investigation into the origin of anomalous calcium-magnesium ratios observed in groundwater through chemical analysis of bore-hole samples.

Analysis of pump-test results, 1962-67.

This project will illustrate the practical application of available analytical methods to well and aquifer evaluation in

Alberta. Formulas and methods are applied to results obtained from separate pumping tests conducted in unconfined and confined aquifers. See Transmissibility determination by the bail-test method, Res. Coun. Alberta Ground Water 2, 1, 38-39, 1964.

770. Westgate, J.A., Univ. of Alberta:

Detailed lithologic study of the glacial tills in south-eastern Alberta, 1965-68.

An attempt is being made to find critical sedimentary parameters that will facilitate correlation. See The surficial geology of the Foremost-Cypress Hills area, Alberta: Research Council of Alberta, Bulletin (in press).

771. Westgate, J.A., Univ. of Alberta, Dreimanis, A., Univ. of Western Ontario:

Postglacial soils and volcanic ash layers at Banff National Park, Alberta, 1962-.

Three distinctive volcanic ash layers are present: the Bridge River ash, the Mazama ash and, possibly, the St. Helen's "Y" ash. See Volcanic ash layers of recent age at Banff National Park, Alberta, Canada, Canadian Journal of Earth Sciences (in press).

772. Westgate, J.A., Univ. of Alberta, Green, R., Research Council of Alberta:

The stratigraphy and palaeoecology of the Saskatchewan gravels at Watino, Alberta, 1966-68.

See Periglacial structures in the Saskatchewan gravels and sands of central Alberta, Canada; Jour. Geol., vol. 72, pp. 641-648, 1964.

British Columbia

773. Fulton, R.J., Geol. Surv. Can.:

Quaternary studies, Vernon (West Half), British Columbia, 1965-.

See Geol. Surv. Can., Paper 66-1, 1966, pp. 56-57.

Quaternary geology, Columbia River, British Columbia.

See Geol. Surv. Can., Paper 66-1, 1966, p. 57 and Paper 67-1A, 1967, p. 58.

774. Leaming, S.F., Geol. Surv. Can.:

Surficial geology, Prince George map-area, British Columbia, 1966-.

See Geol. Surv. Can., Paper 67-1A, 1967, p. 71.

775. Murray, J.W., Mathews, W.H., Univ. of British Columbia:
Pleistocene and recent sediments, Howe Sound, British Columbia.
Concerns the distribution, composition and sedimentary structures of the Recent and Pleistocene sediments in an open marine fjord north of Vancouver. The field work at sea is now completed and the laboratory work will be finished in 1967.
776. Rutter, N., Geol. Surv. Can.:
Surficial geology of Peace River Dam and Reservoir areas, British Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 87-89.

Manitoba

777. Delorme, L.D., Geol. Surv. Can.:
A study of freshwater Ostracoda from Delta, Manitoba, 1966-.
778. McPherson, R.A., Anderson, D.T., Leith, E.I., Univ. of Manitoba:
Pleistocene deposits of Gull Lake-Winnipeg River, Manitoba, 1966-67; M.Sc. thesis (McPherson).
779. Wyder, J.E., Collett, L.S., Geol. Surv. Can.:
Testing side-wall sampler in Pleistocene sediments, Winkler area, Manitoba, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 128-129.

New Brunswick, Nova Scotia and Prince Edward Island

780. Brandon, L.V., New Brunswick Dept. of Natural Resources:
Groundwater in New Brunswick, 1966-67.
Three hundred samples of water have been obtained for chemical analysis, and analysis by computer of river baseflows is in progress to assess groundwater run-off. Studies of salt water intrusion of coastal aquifers may start in 1967.
781. Grant, D.R., Geol. Surv. Can.:
Detailed study and mapping of submerged phenomena and shoreline features, Nova Scotia, 1966-67; Ph.D. thesis.
782. MacNeill, R.H., Acadia Univ. and Nova Scotia Research Foundation:
Pleistocene geology of Nova Scotia, 1951-68.
The mainland of Nova Scotia will be completed in 1968; the study of Cape Breton Island will follow. See Variation in Content

of Drumlins in Southwestern Nova Scotia; Maritime Sediments, vol. 1, No. 3, 1965.

Northwest Territories and Yukon

783. Fyles, J.G., Geol. Surv. Can.:
Quaternary of Western Queen Elizabeth Islands, Northwest Territories, 1964-65.
Preliminary reconnaissance of Quaternary deposits and history of the Western Queen Elizabeth Islands concentrating particularly on extent and age of glaciation; extent of marine submergence; and on the Beaufort Formation. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 8-9.
Quaternary stratigraphy, Mackenzie Delta and Arctic Coastal Plain, Northwest Territories, 1965.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 34-35.
Eskers of the western Shield, Northwest Territories and Arctic Coastal Plain, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 25.
784. Hughes, O.L., Geol. Surv. Can.:
Surficial geology studies, central and southwestern Yukon, 1965.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 48-49.
785. Lerbekmo, J.F., Campbell, F.A., Univ. of Alberta:
Size distribution and composition of the White River Ash deposit, Yukon Territory, 1963-67.
A study of a Recent ash fall as a model for interpreting bentonites in ancient deposits.
786. Rampton, V.N., Geol. Surv. Can.:
Pleistocene geology, Snag-Kluane Lake, southwestern Yukon, 1965-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 50-51.

Ontario

787. Delorme, L.D., Geol. Surv. Can.:
A study of Pleistocene stratigraphy in southwestern Ontario, 1966.
788. Dreimanis, A., Berti, A., Univ. of Western Ontario:
Stratigraphic correlations of glacial deposits between Lake Huron and St. Lawrence lowland, 1958-; Ph.D. thesis (Berti).

See Lake Arkona-Whittlesey and post-Warren radiocarbon dates from "Ridgetown Island", in S. W. Ontario, 1966, Ohio Journal of Science (in press).

789. Henderson, E.P., Geol. Surv. Can.:
Surficial deposits of Athens-Charleston Lake area, Eastern Ontario, 1965-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 142-143.
Regional aspects of glacial chronology and Champlain Sea between St. Lawrence and Ottawa Rivers, 1965-.
790. Hore, R.C., Puccini, D.P., Renzonni, C., Ontario Water Resources Commission:
Hydrogeology and hydrology of Blue Springs Creek; Bowmanville, Soper and Wilmot Creeks; east and middle branches of Oakville Creek; and Venison Creek drainage basins, 1965-.
Intensive instrumentation for measurements of streamflow, groundwater levels, soil moisture and meteorological parameters, with detailed studies of geology, geomorphology and hydrology in drainage basins representative of various geomorphological conditions.
791. Karrow, P.F., Geol. Surv. Can. (part time), Waterloo Univ.:
Tills of the Stratford-Conestogo area, Ontario, 1965-66.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 147-148.
792. Karrow, P.F., Carter, J.C.H., Duthie, H.C., Fernando, C.H., Univ. of Waterloo:
Fossil remains in interstadial and interglacial deposits of the Toronto area, 1966-70.
See Pleistocene geology of the Scarborough area; Ont. Dept. of Mines Geol. Rept. 46, 1966.
793. Mayr, F., Univ. of Western Ontario:
Late glacial history of selected parts of the Great Lakes Region (Field work in Southwestern Ontario), 1966-67.
794. Mellary, A.A., Jeffs, D.N., Singh, B.A., Ontario Water Resources Commission:
Aquifer tests on sand plains at Bothwell and in township of Colchester South, 1966.
Installation of observation wells and completion of pumping tests to determine the geologic and hydraulic characteristics of sand and gravel.

795. Sibul, V., Fleischer, F.C., Morrison, W.D., Ontario Water Resources Commission:
Water Resources Survey of Big Otter Creek Drainage Basin, 1965-66.
Study of geology, water availability, water quality and water use.
796. Tovell, W.M., Royal Ontario Museum:
Correlation of raised beaches in the Sault Ste. Marie area, Manitoulin Island, and Georgian Bay, 1965-68.
See Ancestral Lake Superior shorelines, Montreal River harbour area, Ontario; Proc. Geol. Assoc. Canada, vol. 17, September 1966.

Quebec

797. Dessureault, R., Quebec Dept. of Natural Resources:
Hydrogeological survey of the Madeleine Islands, Quebec, 1966-68.
798. Dubé, J.C., Quebec Dept. of Natural Resources (part time), McGill Univ.:
Pleistocene and recent geology of the Arthabaska region, Quebec, 1965-67.
799. Grenier, C., Quebec Dept. of Natural Resources:
Etude de formations aquifères au moyen de puits filtrant dans les municipalités de la Province de Québec, 1965-67.
800. Koulomzine, T. and graduate students, Ecole Polytechnique, Université de Montréal:
Systematic study of the geophysical properties of the unconsolidated rocks of the St. Lawrence lowlands, 1966-68.
801. Lasalle, P., Quebec Dept. of Natural Resources:
Pleistocene geology of the Beloeil area, Quebec, 1961-66.
Late Quaternary vegetation and glacial history of the St. Lawrence Lowlands, Canada.
Pleistocene geology of the Lac St. Jean area, Quebec.
802. Ledoux, R.L., Université Laval:
Mineralogical studies of quick clays in the Province of Quebec, 1965-68.
Includes mineralogical, mechanical and physicochemical studies of the quick clays.

803. McDonald, B.C., Geol. Surv. Can.:
Glacial geology of Eaton River watershed and adjacent areas of
southeastern Quebec, 1966.
See Geol. Surv. Can., Paper 67-1A, 1966, pp. 166-167.
804. McDonald, B.C., Geol. Surv. Can.:
Auriferous till in Eastern Townships, southeastern Quebec,
1965-66.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 51-54.
805. Simard, G., Quebec Dept. of Natural Resources:
Hydrogeological study of Aylmer-St. Francois Lakes area,
Quebec, 1965-67.
806. Tiphane, M., Quebec Dept. of Natural Resources (part time), Univ.
of Montreal:
Sand and gravel beaches on the Gaspesian coast, Quebec, 1966-67.
Study of the behaviour of beach material to find out the
effects, if any, of the exploitation of sand and gravel pits on
neighbouring areas.
807. Tremblay, G., Quebec Dept. of Natural Resources (part time), Univ.
of Laval:
Pleistocene and Recent geology of Isle-Maligne-St. Ambroise
area, Quebec, 1964-66.
808. Tremblay, J.J., Quebec Dept. of Natural Resources:
Groundwater of the Eaton River basin, Quebec, 1965-.
Nearly half the basin has been covered by seismic hammer
survey to determine the drift thicknesses and assess the import-
ance of the geological parameters involved. To establish the
geological formations contributing to base flow a net work of
sampling points has been set-up on the different streams. To
compare results obtained from surface samples the wells in the
region have been sampled. From the results obtained the big
contributor to base flows appears to be the bank storage from the
alluvial flats. Hydrogeological studies of the alluvial flats will be
undertaken to assess their potential contribution.

Saskatchewan

809. Billings, G.K., Freeze, R.A., Univ. of Calgary:
Hydrogeochemical balances within groundwater drainage basins,
Good Spirits Lake, Saskatchewan.

810. Klassen, R.W., Geol. Surv. Can.:
Surficial geology and geomorphology, Assiniboine Valley,
Saskatchewan and Manitoba, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 125-126.
811. Kupsch, W.O., Univ. of Saskatchewan:
Selected problems of glacial geology in Saskatchewan - a continuing project.
See Jointing of boulders caused by flowing ice; Alta. Soc. Pet. Geologists Guidebook 15th Ann. Field Conf., Part 1, Cypress Hills Plateau, pp. 112-115, 1965.
812. Mott, R.J., Geol. Surv. Can.:
Palynological studies in central Saskatchewan, 1965.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 122-123.
813. Rozkowski, A., Geol. Surv. Can. (N.R.C. Postdoctorate Fellow):
Hydrochemistry of Moose Mountain area, Saskatchewan, 1966-67.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 31-34.

General Problems

814. Becker, A., Geol. Surv. Can.:
Development of new electrical method of geophysical mapping of surficial deposits and sulphide conductors, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 130-131 and 197.
815. Billings, G.K., Hitchon, B., Univ. of Calgary:
Trace element composition of subsurface brines.
816. Brown, R.J.E., Division of Building Research, National Research Council:
Permafrost distribution in Canada, 1953-.
Observations on the occurrence of permafrost throughout the permafrost region of Canada, with emphasis on the southern fringe area, are being collected continuously by direct field observations, review of the technical literature, reports from other individuals and agencies, and questionnaire; this information is recorded on punch cards and plotted on the 8 mile:1 inch maps of Canada. Accompanying this collection of information is the study of the climatic and terrain factors comprising the permafrost environment as a means of improving the understanding of and ability to predict the distribution and occurrence of permafrost. See Relation between mean annual air and ground temperatures in the permafrost region of Canada; Proceedings Permafrost

International Conference, Perdue University, 1966, pp. 241-247 (NRC 9272).

817. Burke, K.B.S., Geol. Surv. Can. (part time):
Amplitude and frequency characteristics of seismic waves in the study of groundwater problems, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 120-121.
818. Burke, K.B.S., Wyder, J.E., Univ. of Saskatchewan:
Application of geophysical methods to problems of groundwater location in the Canadian prairies, 1963-67; Ph.D. thesis (Wyder).
Evaluation of the application of conventional surface geophysical techniques to specific geohydrological problems in south-eastern Saskatchewan.
819. Chagnon, J.Y., Quebec Dept. of Natural Resources:
Clays and ground slides, 1965-.
A continuing program of research on clays and ground slides including study of areas where sliding has occurred and collection of clay samples for a determination of their physical properties.
820. Craig, B.G., Geol. Surv. Can.:
Reconnaissance glacial investigations, Thelon River Basin, Churchill area, and Hudson Bay Lowland, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 199.
821. Crain, I.K., McGill Univ.:
The influence of post-Wisconsin climatic changes on thermal gradients, 1966-67; M.Sc. thesis.
822. Dreimanis, A., Vagners, U.J., Univ. of Western Ontario:
Relationship of lithologic and granulometric composition of till to bedrock, 1962-; Ph.D. thesis (Vagners).
See Till-bedrock lithologic relationship, INQUA Proceedings (post-congress publication, in press).
823. Elson, J.A., McGill Univ.:
Strandlines and end moraines of glacial Lake Agassiz, 1964-68.
The extent of Lake Agassiz has been outlined (revised from previous work). Many new beach altitudes have been measured and strandlines are being traced on airphotos and ground checked, as are end moraines that appear to be involved in the history of the lake. Lake levels are being dated by C14 and other methods based on certain events dated by C14. See History of glacial Lake Agassiz: in Lowther, G., ed., Problems of the Pleistocene and Arctic; McGill University Museums Pub. No. 2, pp. 1-16, 1962.

824. Elson, J.A., Yong, R., Frenkel, O.J., Douglas, G., McGill Univ.:
The effect of chemical additives on the permeability of clay soils to water, 1960-; M.Sc. theses (Frenkel and Douglas).
Measurements of the threshold and critical gradients for the movement of water through kaolinite and attapulgite have been made in a permeameter that enables control of the particle spacing and orientation. Pressure gradients from -0.1 to 9 atmospheres have been applied to salt solutions ranging from 0.1 normal to 1.0 normal, and these data are being applied to learn the cause of the deviations from the diffusive flow predicted by Kemper. Future work will include the measurement of electro-kinetic potentials to enable the separation of the relative effects of diffusive flow from those of viscous flow especially near threshold gradients. This study has many applications to geology, including the salt-seiving effect, movement of oil field fluids, infiltration of surface water to the groundwater reservoir, and the behaviour of soils during wetting and drying.
825. Fetulah, A., Univ. of Manitoba:
Effect of freezing on the physical properties of Agassiz clay with special reference to hydro tower anchor pullouts; M.Sc. thesis.
826. Fyles, J.G., St. Onge, D.A., Geol. Surv. Can.:
Study of eskers in the western Canadian Shield, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 25.
827. Gorman, W.A., Queen's Univ.:
Transport by esker streams, 1966-68.
The distances that Precambrian particles of various sizes have been transported across the Palaeozoic lowland is being investigated, and is being compared to the distances of transport of Precambrian particles in the adjacent ablation moraine.
Deglaciation of southern Quebec and eastern Ontario, 1963-68.
Palaeogeographic maps of the area under study have been drawn up, but as new data become available, revisions are necessary. The fundamental data used in the preparation of the maps are curves of sea-level changes and curves showing rates of isostatic recovery. See Palaeogeography of the Champlain Sea, 1965, Abstracts VII Internat. Cong. INQUA, Boulder and Denver, Colorado.
828. Gretener, P.E., Univ. of Calgary:
Thermal instability of large diameter wells, 1967-.
Field observations indicate that large diameter wells are thermally unstable as predicted by the theory. This places a

limit on temperature observations in such wells. It is planned to study the ensuing disturbances with the help of models in the laboratory. The theory only predicts the onset of convection but does not describe the motions to be expected.

829. Imantz, D., Univ. of Manitoba:
A study of the optimum lime and moisture content for the stabilization of Agassiz clay subgrades; M.Sc. thesis.
830. Lee, H.A., Geol. Surv. Can.:
Glaciofocus research, 1962-.
A long range study using glacial methods of mineral exploration in the Canadian Shield. See Geol. Surv. Can., Paper 67-1A, 1967, p. 149.
831. Lewis, C.F.M., Geol. Surv. Can.:
Post-glacial shoreline features in northern Lake Huron Basin, 1965-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 150-153.
832. Quigley, R.M., Dreimanis, A., Univ. of Western Ontario:
Secondary aragonite in a soil profile, 1966.
See Secondary aragonite in a soil profile, Earth and planetary science letters, vol. 1, pp. 348-350, 1966.
833. Russell, G.A., Univ. of Manitoba:
An investigation of the effects of varying lime and moisture content on the stabilization of Agassiz clays, by differential thermal analysis.
Airphoto analysis of a research drainage basin in permafrost for the international Hydrologic Decade.
834. Scott, J.S., Geol. Surv. Can.:
Slope stability, Saskatchewan, Alberta and Manitoba, 1962-66.
Study of geological and hydrogeological factors affecting the stability of slopes. See Geol. Surv. Can., Paper 67-1A, 1967, p. 124.
835. Terasmae, J., Geol. Surv. Can.:
Palynological investigations, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 164 and Paper 66-2, 1966, pp. 54-55.
836. Usik, L., Geol. Surv. Can.:
Circular features in organic terrain, 1965-66.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 55-56.

837. Westgate, J.A., Univ. of Alberta, Dreimanis, A., Univ. of Western Ontario:

Stratigraphic study of the Pleistocene deposits in the Woodstock area, southwestern Ontario, 1964-67.

Quaternary volcanic ash deposits in Alberta and adjacent areas, 1964-.

Volcanic ash layers are sufficiently common and widespread in the Quaternary deposits of Alberta to serve as time-stratigraphic marker horizons provided that they can be identified and correlated. The present stage of research involves (a) collection of samples and description of stratigraphic position, and (b) mineralogical investigations. See Volcanic ash layers of Recent age at Banff National Park, Alberta, Canada; Can. Jour. Earth Sciences (in press).

SEDIMENTATION

838. Buchwald, C.E., McMaster Univ.:

Study of the shoreline processes of Lake Erie, 1966-.

Long Point, on the north shore of Lake Erie, is a prominent spit about 25 miles long and from one to five miles wide. Largely untouched by man-made projects, the spit is a natural laboratory for the investigation of shoreline processes. Research is being undertaken on the nourishment and erosion of the beach and the distribution of sediments in the foreshore, shore, beach and dune areas.

839. Campbell, F.A., Univ. of Manitoba:

Studies of the sedimentary rocks of the Rice Lake district, Manitoba, 1966-69; Ph.D. thesis.

840. Church, W.R., Young, G.M., Univ. of Western Ontario:

Stratigraphy, structure and sedimentology of the Huronian north of Manitoulin Island, Ontario, 1963-.

See Huronian stratigraphy of the McGregor Bay area, Ontario: relevance to the paleogeography of the Lake Superior region. Canadian Jour. Earth Sci., vol. 3, 203-210, 1966.

841. Coakley, J.P., Rust, B.R., Univ. of Ottawa:

Sedimentary history of Stanwell-Fletcher Lake, Somerset Island, Northwest Territories, 1965-67; M.Sc. thesis (Coakley).

Study of the textural, mineralogical and chemical characteristics of the lake sediments is virtually complete. Further work will investigate the lake-margin deltas, and will attempt to establish a model for post-Pleistocene desalination of the lake basin.

See Sedimentation in an Arctic lake (Abstract) G.S.A. Annual Meeting, San Francisco, 1966.

842. David, P.P., Université de Montréal:
Study of selected sand dune areas in Canada, 1965-68.
843. Felsher, M., McMaster Univ.:
Processes of sedimentation resulting in the formation of turbidity current deposits, 1966-.
Determination of the granulometric characteristics of such deposits as have been recovered in cores from the Santa Cruz submarine canyon, off the California coast. This study is being extended to similar sediments from the Bahamas.
844. Fleet, M.E., Univ. of Western Ontario:
Use of boron as an indicator of palaeosalinity, 1962-67.
See Preliminary investigation into the sorption of boron by clay minerals; Clay Minerals Bulletin, vol. 6, p. 3, 1965.
845. Garrison, R.E., Univ. of British Columbia:
Electron microscopy of pelagic limestones, 1965-67.
See Electron microscopy of Franciscan Pelagic limestones, California (Abstract); Program, 1966 Annual Meeting, Geol. Soc. America, pp. 75-76.
846. Gees, R.A., Dalhousie Univ.:
Sedimentology of the Bedford Basin and adjacent areas, Nova Scotia, 1966-69.
847. Grant, D.R., Geol. Surv. Can.:
Detailed study and mapping of submerged phenomena and shore-line features, Nova Scotia, 1966-67; Ph.D. thesis.
848. Greggs, R.G., Young, H., Queen's Univ.:
Carbonate petrography of Virden Member, Lodgepole Formation, Manitoba, 1965-67; Ph.D. thesis (Young).
Involves sedimentological investigations on core from wells in the Virden area.
849. Harriss, R.C., McMaster Univ.:
Nucleation of calcium carbonate in natural water systems, 1966-.
A study of the factors controlling the kinetics of calcium carbonate nucleation in ocean and lake waters.

850. Henning, R.H., McGill Univ.:
Petrography and provenance of conglomerates in the Brazeau Formation, Alberta, 1967-68; M.Sc. thesis.
851. Hoffman, P.F., Geol. Surv. Can. (part time):
Stratigraphy, sedimentology, and paleocurrents in East Arm of Great Slave Lake, Northwest Territories, 1966-; Ph.D. thesis, Johns Hopkins Univ.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 36-39.
852. Jordan, F.W., McMaster Univ.:
Origin of an horizon of carbonate concretions in one of the Hamilton shale members near Buffalo, New York, 1965-67; M.Sc. thesis.
Study of the chemical system that leads to formation of carbonate concretions.
853. Kramers, J.W., Univ. of Alberta:
The Gilwood sandstone of the Mitsue-Nipisi area, Alberta, 1966-67; M.Sc. thesis.
A petrographic and chemical study aimed at interpretation of depositional environment and diagenetic changes.
854. Lajoie, J., Léonard, M.A., Mathey, B., Université de Montréal:
Anatomie du flysch de Rimouski, Quebec, 1966-69.
Pétrographie de la séquence; provenance; milieu de sédimentation; paléographie.
855. Lawson, D.E., Univ. of Waterloo:
Sedimentology and stratigraphy of the Torridonian of parts of Wester Ross and Sutherland, northwest Scotland, 1962-67.
Includes study of: (1) a volcanic ash-flow and mud-low complex within the lower Torridonian (2) major and trace element content of Torridonian grey shales (3) possible marine phytoplanktonic fossils from Torridonian grey shales. See Lithofacies and correlation within the lower Torridonian, Nature, vol. 207, No. 4998, pp. 706-708, 1965.
Sedimentology and stratigraphy of the Boss Point Formation in southeastern New Brunswick, 1962-69.
Includes study of plant fragment orientation in relation to palaeocurrents and palaeoenvironment. See Sedimentary facies and palaeocurrents in the Boss Point Formation, southeastern New Brunswick, abstract Bull. Amer. Assoc. Pet. Geol., vol. 47, No. 2, pp. 361-362, 1963.

Sedimentology of the Memramcook and Petitcodiac Rivers and their estuary, southeastern New Brunswick, 1966-.
Recent sediments of the Shediac Bay area, New Brunswick, 1966-.

856. Lerbekmo, J.F., Campbell, F.A., Univ. of Alberta:
Chemical composition of Cretaceous shales in Alberta, 1961-67.
See Mineralogic and chemical variations between Upper Cretaceous continental Belly River shales and marine Wapiabi shales in Western Alberta, Canada; Sedimentology, vol. 2, pp. 215-226, 1963.
857. Lewis, C.F.M., Geol. Surv. Can.:
Lake Ontario bottom deposits, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 153.
858. Macintyre, I.G., McGill Univ.:
Recent sedimentation of the west coast of Barbados, W.I., 1965-67; Ph.D. thesis.
Study of sea floor, distribution of marine flora and fauna, reefs and associated sediments, submerged reefs, relationship to older in situ sediments and outcrops. See Submerged Coral Reefs, west coast of Barbados, West Indies. Can. Jour. Earth Sciences (in press).
859. MacQueen, R.W., Price, L.L., Geol. Surv. Can.:
Studies of evaporite-carbonate-clastic suite, Souris River Formation (Devonian), Saskatchewan.
Seeks a better understanding of the origin of the Souris River Formation cycles, and relations of the rock types within them.
860. Mason, G.D., McGill Univ.:
Depositional environment of the Lorraine and Richmond groups, Quebec, 1966-67; M.Sc. thesis.
861. Mathews, W.H., Murray, J.W., Kellerhals, P., Univ. of British Columbia:
Sedimentation in the Fraser River Delta, British Columbia - a continuing project.
Includes studies of properties of freshly deposited sediment and changes taking place with time and change in pore water composition; studies of land subsidence in and near the delta; and studies of intertidal environments and processes. See Sedimentation of Fraser River Delta, British Columbia; Bull. Am. Assn. Petrol. Geol., vol. 46, pp. 1416-1443.

862. May, R.E., Univ. of Calgary:
Sedimentology of Lower Cretaceous Sands, central Alberta, 1966-67; M.Sc. thesis.
863. Miall, A.D., Rust, B.R., Univ. of Ottawa:
The sedimentology and palaeogeography of the Devonian Peel Sound Formation of Somerset and Prince of Wales Islands, Northwest Territories, 1966-68; Ph.D. thesis (Miall).
Laboratory work on material collected from the Peel Sound Formation on Somerset Island is nearing completion, but at least one more field season will be required on Prince of Wales Island, to give a better regional picture of tectonic control of Lower Palaeozoic sedimentation by movements on the Boothia Arch.
864. Middleton, G.V., McMaster Univ.:
Statistical study of operator error in modal analysis of complex sandstones (especially turbidites).
Construction of a flume for sedimentological experiments, 1966-.
865. Mountjoy, E.W., and graduate students, McGill Univ.:
Recent sediments west coast of Barbados, B.W.I., 1964-.
Research includes the study of sea floor morphology, distribution of marine flora and fauna, reefs and associated sediments. The origin and processes controlling distribution of the various types of calcareous and terrigenous sediments and their relationship to organisms are being investigated as well as their geochemistry.
866. Mountjoy, E.W., Clack, W.J., Pendlebury, G.B., McGill Univ.:
Carbonate sedimentation Carriacou, Grenadines, West Indies, 1966-69; Ph.D. thesis (Clack), M.Sc. thesis (Pendlebury).
A study of carbonate sedimentation to determine origin and controlling processes of various types of calcareous and terrigenous sediments and compare this with Barbados and other areas in the Caribbean region.
867. Mukherji, K.K., Univ. of Western Ontario:
Carbonate petrology of the Middle Ordovician Black River Group, southwestern Ontario, 1963-67; Ph.D. thesis.
The Black River section at Marmora has been described in a primary manuscript and will serve as a standard. Stratigraphic sections from Collingwood to Kingston have been collected with the objective of establishing regional correlation. The trend of clasts in closely spaced oriented samples will be used to establish current direction.

868. Murray, J.W., Macdonald, R.D., Univ. of British Columbia:
Composition and genesis of Recent manganese concretions in
Jervis Inlet, British Columbia, 1966-; M.Sc. thesis
(Macdonald).
This project is concerned with the composition and genesis of
manganese concretions that are present at a depth of 1,200 feet in
Jervis Inlet. Initial data suggest that the concretions are post-
Pleistocene in age.
869. Murray, J.W., Mackintosh, E.E., Univ. of British Columbia:
Interstratified glauconite-montmorillonoid pellets, Queen
Charlotte Sound, British Columbia, 1966.
A study of glauconite pellets from Queen Charlotte Sound,
B.C. using X-ray diffraction and chemical analysis and concerned
with the structure of the clay minerals present and their
diagenetic modification.
870. Murray, J.W., Mathews, W.H., Univ. of British Columbia:
Pleistocene and recent sediments, Howe Sound, British Columbia.
Concerns the distribution, composition and sedimentary
structures of the Recent and Pleistocene sediments in an open
marine fjord north of Vancouver. The field work at sea is now
completed and the laboratory work will be finished in 1967.
871. Parkash, B., McMaster Univ.:
Study of the mechanism of deposition of turbidite beds in the
Cloridorme Formation, Gaspé, Quebec, 1965-; Ph.D. thesis.
A group of beds have been traced along strike for 3,100 yards.
The strike is parallel to the mean direction of palaeocurrents
from E-W as deduced from sole marks. A detailed study of ver-
tical and lateral changes in grain size, fabric and internal organ-
ization of these beds is planned.
872. Rust, B.R., Univ. of Ottawa:
Sedimentary features of Cretaceous/Tertiary rocks on Somerset
Island, Northwest Territories, 1965-67.
Includes the relationship between Cretaceous/Tertiary rocks
and the basement, deformed crossbedding in the sediments, and
the palaeogeography of the area.
The sedimentology and palaeogeography of Carboniferous rocks in
Cape Breton Island, Nova Scotia, 1965-67.
Sedimentary structures, lithologies and clast types in Horton
Group (Mississippian) sediments are being studied as guides to
Horton depositional environments and palaeogeography. Sed-
imentary structures in the Pictou Group (Pennsylvanian) are also
being investigated.

873. Schenk, P.E., Dalhousie Univ.:
Study of the depositional environment, fauna, and flora of the Windsor Group (Mississippian) of Nova Scotia, 1963-.
This study is concerned with field relations, carbonate petrology, identification of fauna and flora, palaeoecology, insoluble-residue analysis, and elemental analysis to interpret the palaeo-environment and chronostratigraphy of the Windsorian Stage (Mississippian). See The Macumber Formation of the Maritime Provinces, Canada - a Mississippian analogue to Recent strandline carbonates of the Persian Gulf: Jour. of Sedimentary Petrology (in press).
874. Schenk, P.E., Campbell, F.A., Dalhousie Univ.:
Palaeocurrent, basin analysis, and petrology of the Lower Palaeozoic Meguma Group, Nova Scotia, 1965- ; M.S. thesis (Campbell).
A 4,500 square-mile area of Meguma outcrop has been studied using a 3-mile grid. Lithology, metamorphism, type and orientation of primary sedimentary structures, and texture are measured or described at every location point. Orientated thin-sections of basal portions of arenite layers are described and classified. This is the first over-all sedimentologic study of the main rock mass of Nova Scotia.
875. Solohub, J., Univ. of Manitoba:
Recent sedimentary environment studies in the Grand Beach area, Manitoba, 1965-67; M.Sc. thesis.
876. Tiphane, M., Université de Montréal:
Etude des sédiments récents et physiographie sous-marine du Golfe St-Laurent, 1961-68.
877. Usher, J.L., Yorath, C.J., Queen's Univ.:
Sedimentation on the northeastern Scotian Shelf, 1965-67; Ph.D. thesis (Yorath).
878. van de Poll, H.W., New Brunswick Dept. of Natural Resources:
Sedimentation and palaeocurrents in the Carboniferous basins of New Brunswick, 1965-.
The study of sedimentation and palaeocurrents in the Carboniferous basins of New Brunswick is designed to gain a better understanding of the stratigraphy, tectonics and basin configuration.
879. Vemuri, R., McMaster Univ.:
A statistical examination of the hypotheses for the genesis of cyclothems, 1965-68; Ph.D. thesis.

Cyclothem from a broad non-marine basin are being studied statistically with a view to determining their genesis.

880. Vonhof, J.A., Geol. Surv. Can.:
Stratigraphy and structure of Tertiary gravels, Alberta and Saskatchewan, 1966-67; Ph.D. thesis.
881. Walker, R.G., McMaster Univ.:
Study of the sedimentary analysis of lithofacies sequences, 1966-.
Turbidite studies are emphasized, and trends are being analyzed, using the McMaster IBM 7040 computer, with a view to studying basin evolution in quantitative terms. Data are currently being collected from the Upper Devonian, Central Appalachians, and from the Upper Carboniferous; North Devon, England.
882. Williams, G.D., Univ. of Alberta:
Recent fluvial and associated sediments in Western Canada, 1962-.
See Origin of shale-pebble conglomerate; Bull. Amer. Assoc. Petroleum Geologists, vol. 50, pp. 573-577, 1966.
883. Yole, R.W., and graduate students, Carleton Univ.:
Stratigraphy, sedimentology and palaeontology of Sicker Group, Vancouver Island, 1961-67.
Sedimentological investigation at St. Clair River Delta, Ontario, 1966-70.
884. Young, G.M., Univ. of Western Ontario:
Regional investigation of sedimentology and provenance of the Gowganda Formation (Huronian), Ontario, 1966-68.
885. Young, G.M., Chandler, F.W., Univ. of Western Ontario:
Stratigraphy and sedimentology of Huronian rocks in Harrow and McKinnon townships, Ontario, 1964-67.

STRATIGRAPHY AND PALAEOONTOLOGY

Precambrian

886. Christie, R.L., Geol. Surv. Can., Dawes, P.R., Greenland Geological Survey:
Stratigraphy and age of Precambrian sedimentary rocks and contained sills and dykes, east coast of Arctic Islands and northwest and north Greenland, 1967-.

887. Church, W.R., Young, G.M., Univ. of Western Ontario:
Stratigraphy, structure and sedimentology of the Huronian north of
Manitoulin Island, Ontario, 1963-.
See Huronian stratigraphy of the McGregor Bay area, Ontario:
relevance to the paleogeography of the Lake Superior region.
Canadian Jour. Earth Sci., vol. 3, 203-210, 1966.
888. Donaldson, J.A., Geol. Surv. Can.:
Stratigraphic study of Dubawnt Group, Northwest Territories,
1963-66.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 23-24.
889. Goodwin, A.M., Geol. Surv. Can.:
Timmings-Kirkland Lake-Noranda volcanic belts, Ontario and
Quebec, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 138-142.
890. Hoffman, P.F., Geol. Surv. Can. (part time):
Stratigraphy, sedimentology, and palaeocurrents in East Arm of
Great Slave Lake, Northwest Territories, 1966-; Ph.D.
thesis, Johns Hopkins Univ.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 36-39.
891. Jolliffe, A.W., Riley, R., Queen's Univ.:
Bauxite of Archaean age, Steep Rock Lake, Ontario, 1964-67;
M.Sc. thesis (Riley).
See Stratigraphy of the Steeprock Group, Steep Rock Lake,
Ontario; Geol. Assoc. of Canada, Special Paper No. 3, June 1966.
892. Keating, B.J., St. Francis Xavier Univ.:
Geology of the George River Group of Cape Breton Island, Nova
Scotia, 1963-67.
893. Milligan, G.C., Creed, R.M., Chatterjee, A.K., Sinha, R.,
White, B., Dalhousie University:
Investigations in George River Series, Cape Breton, Nova Scotia,
1962- ; M.Sc. theses (Creed, Chatterjee and Sinha).
It has been necessary to spend much time in routine mapping
to find the stratigraphy and structure of the Series, hertofore
essentially unmapped. More detailed investigations in vicinity of
known mineralization are now being undertaken.
894. Ridler, R.H., Geol. Surv. Can.:
Volcanic-sedimentary stratigraphy and its relation to mineral
occurrences, Kirkland Lake, Ontario, 1966-; Ph.D. thesis.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 159-162.

895. Young, G.M., Chandler, F.W., Univ. of Western Ontario:
Stratigraphy and sedimentology of Huronian rocks in Harrow and
McKinnon townships, Ontario, 1964-67.
896. Young, G.M., Church, W.R., Univ. of Western Ontario:
Stratigraphy, structure and sedimentology of Huronian rocks of
the region north of Manitoulin Island, Lake Huron, Ontario,
1964-67.
See The Huronian system in the Sudbury district and adjoining
areas of Ontario: a review. Proc. Geol. Assoc. Can. vol. 17,
pp. 65-82, 1966.

Cambrian to Silurian

897. Aitken, J.D., Fritz, W.H., Geol. Surv. Can., Whittington, H.B.,
Univ. of Cambridge:
Stratigraphy and palaeontology of Burgess shale, southern Rocky
Mountains, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 52.
898. Bolton, T.E., Geol. Surv. Can.:
Stratigraphic-palaeontologic study of Ordovician and Silurian
formations, Anticosti Island, 1957-.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 216.
899. Copeland, M.J., Geol. Surv. Can.:
Ordovician and Silurian biostratigraphy, Anticosti Island, Quebec,
1964-66.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 216.
900. Dawes, P.R., Greenland Geological Survey:
Lower palaeozoic rocks, western part of north Greenland Fold
Belt, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 4-6.
901. Fritz, W.H., Geol. Surv. Can.:
Cambrian biostratigraphy in the Canadian Eastern Cordillera,
British Columbia and Alberta, 1965-.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 58.
902. Handfield, R.C., Geol. Surv. Can.:
Lower Cambrian biostratigraphic studies, Mackenzie Mountains,
Northwest Territories, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 125.

903. Hay, P.W., New Brunswick Dept. of Natural Resources:
Stratigraphy and structure of the Silurian Mascarene volcanics,
Charlotte county, New Brunswick, 1965-68.
Detailed field mapping to extend the Silurian stratigraphy as
deciphered in Maine into New Brunswick, to interpret the struc-
ture of volcanics, and to determine favourable localities for
detailed mineral exploration.
904. Hubert, C., Quebec Dept. of Natural Resources:
Sedimentological, stratigraphical and structural study of the
Cambro-Ordovician rocks exposed along the south shore of
the St. Lawrence River, Quebec, 1961-69.
See Tectonics of parts of the Sillery in the Chaudière-
Kamouraska segment of the Quebec Appalachians, Trans. Roy.
Soc. Canada, 1966.
905. Lenz, A.C., Univ. of Western Ontario:
Upper Silurian and Lower Devonian biostratigraphy of Royal
Creek, Yukon Territory.
See Upper Silurian and Lower Devonian Paleontology and
Correlations, Royal Creek, Yukon Territory: A Preliminary
Report. Bull. Can. Petrol. Geol., vol. 14, No. 4, 1966 (Dec.
Issue),
Upper Silurian and Lower Devonian graptolite biostratigraphy of
Northwest Territories and Yukon.
See New Occurrences of Graptolites from the South Nahanni
Region, Northwest Territories and Yukon. Bull. Can. Petrol.
Geol., vol. 12, No. 4, pp. 892-900, 1964.
906. Liberty, B.A., Univ. of Guelph:
Stratigraphic studies of middle Ordovician and Cambrian strata in
the St. Joseph Island - Sault Ste. Marie area, Ontario, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 154-155.
Palaeozoic stratigraphy of southern Ontario.
See Stratigraphy of the Bruce Peninsula area, Ontario; Geol.
Surv. Can., Paper 65-41, 1966.
907. Mason, G.D., McGill Univ.:
Depositional environment of the Lorraine and Richmond Groups,
Quebec, 1966-67; M.Sc. thesis.
908. Mukherji, K.K., Univ. of Western Ontario:
Carbonate petrology of the Middle Ordovician Black River Group,
southwestern Ontario, 1963-67; Ph.D. thesis.
The Black River section at Marmora has been described in a
primary manuscript and will serve as a standard. Stratigraphic

sections from Collingwood to Kingston have been collected with the objective of establishing regional correlation. The trend of clasts in closely spaced oriented samples will be used to establish current direction.

909. Petryk, A.A., Univ. of Saskatchewan:
Mississippian foraminifera and biostratigraphy of Western Canada, 1965-68; Ph.D. thesis.
910. Rice, D., Univ. of Alberta:
Pre-Chinchaga stratigraphy of Great Slave Lake region, Northwest Territories, 1965-67; M.Sc. thesis.
911. Sharp, D.A., Beards, R., Sanford, B.V., Berry, C., Hadley, C., Hill, J.V., Winder, C.G., Ont. Dept. Energy and Resources Management, Geol. Surv. Can. and Univ. of Western Ontario:
Stratigraphic nomenclature of the Palaeozoic sediments in southwestern Ontario, 1965-67.
The Ontario Well-data-Computer Project, directed by R.J. Brigham at the University of Western Ontario, illuminated the fact that the definition of formation contacts in the sub-surface based on lithologic and mechanical logs must be consistent. The stratigraphic sections in about 30 wells spread across the region will serve as a reference grid.
912. Smith, L., Queen's Univ.:
Spatial relations of Middle Ordovician units in Oklahoma, 1965-68.
Concerns the depositional/erosional relationships within the Simpson Group, with reference to the position of the base of the Tippecanoe Sequence.
913. Usher, J.L., Peterson, N.N., Queen's Univ.:
Ordovician stratigraphy and structure between Kingston and Sydenham, Ontario, 1964-66; Ph.D. thesis (Peterson).
In addition to that from surface outcrops, information has been derived from a series of holes drilled through the Ordovician rocks to basement.
914. Winder, C.G., Univ. of Western Ontario:
Stratigraphy of the Middle Ordovician, southwestern Ontario, 1951-.
The investigation includes both palaeontology and sedimentary petrology. See Fabric of a Middle Ordovician Limestone at Colborne, Ontario, Can. Journal of Earth Science (in press).

Devonian to Permian

915. Aitken, J.D., Geol. Surv. Can.:
Pre-Devonian stratigraphy, Alberta, 1961-64.
Study of pre-Devonian stratigraphy in such detail as to permit precise correlations and to delineate depositional trends and develop criteria by which subsurface pre-Devonian strata of the foothills and plains may be correlated with the exposed sections. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 96-97.
916. Beales, F., Univ. of Toronto:
Palaeoecology and petrography of Devonian reefs of Western Canada - a continuing project.
See Precipitation of lead-zinc ores in carbonate reservoirs as illustrated by Pine Point ore field, Canada; Transactions of Institution of Mining & Metallurgy, vol. 75, 1966. This paper is the outcome of study of Middle Devonian Presqu'ile reef complex. Study of reef-evaporite facies relations in other areas is continuing.
Palaeoecology and petrography of Black River limestones of southern Ontario - a continuing project.
See Diagenesis in pelleted limestones; Soc. Econ. Palaeont. & Min., Special Paper No. 13.
917. Belyea, H.R., MacKenzie, W.S., Geol. Surv. Can.:
Middle Devonian correlation (subsurface), Yukon to Saskatchewan, 1965-66.
918. Braun, W.K., Univ. of Saskatchewan:
Devonian microfaunas and biostratigraphy of Western Canada, 1964-.
919. Crowell, G., Acadia Univ.:
Stratigraphy and structure of a section of the Windsor Group on the Meander River, Hants County, Nova Scotia, 1965-67; M.Sc. thesis.
920. Danner, W.R., Univ. of British Columbia:
Stratigraphy and palaeontology of the Cache Creek Group in southwestern British Columbia, 1964-.
Detailed studies of the Cache Creek Group in its type area near Cache Creek and Clinton, and the correlative sequences easterly to Kamloops and south-easterly to Vernon area and beyond. Also studies of correlative groups on Vancouver Island and in the Chilliwack area of British Columbia and in northwestern Washington State. See Permian Calcareous algae from northwestern Washington

and southwestern British Columbia; Jour. of Palaeontology, vol. 40, No. 2, March, 1966.

921. Ferguson, L., Mount Allison Univ.:
Studies of a Lower Carboniferous marine transgression, 1957-68.
See The Paleocology of Lingula squamiformis Phillips (PS) during a Scottish Mississippian marine transgression; J. of Paleontology, vol. 37, May, 1963, pp. 669-681.
A stratigraphic and faunal study of the Permo-Pennsylvanian of north-central Ellesmere Island, N.W.T., 1961-68.
A stratigraphic and palaeoecologic study of the Permo-Pennsylvanian productid genus Waagenoconcha Chao from the Yukon and Northwest Territories, 1960-67.
Involves the correlation of shell size stage at which geniculation occurs and the coarseness of ornament with stratigraphic position and sediment types.
922. Havard, K., Univ. of Calgary:
Stratigraphic relation of Bakken Sandstone and Exshaw Shale, 1966-67; M.Sc. thesis.
923. Holter, M., Wardlaw, N.C., Univ. of Saskatchewan:
Middle Devonian potash beds in Saskatchewan, 1965-67; M.Sc. thesis (Holter).
A regional study of the Middle Devonian potash beds in southern Saskatchewan. The objective is to correlate beds on a regional basis, define major mineralogical changes, and define major sub-basins.
924. Kramers, J.W., Univ. of Alberta:
The Gilwood sandstone of the Mitsue-Nipisi area, Alberta, 1966-67; M.Sc. thesis.
A petrographic and chemical study aimed at interpretation of depositional environment and diagenetic changes.
925. Lawson, D.E., Univ. of Waterloo:
Sedimentology and stratigraphy of the Torridonian of parts of Wester Ross and Sutherland, northwest Scotland, 1962-67.
Includes study of: (1) a volcanic ash-flow and mud-low complex within the lower Torridonian (2) major and trace element content of Torridonian grey shales (3) possible marine phytoplanktonic fossils from Torridonian grey shales. See Lithofacies and correlation within the lower Torridonian, Nature, vol. 207, No. 4998, pp. 706-708, 1965.
Sedimentology and stratigraphy of the Boss Point Formation in southeastern New Brunswick, 1962-69.

Includes study of plant fragment orientation in relation to palaeocurrents and palaeoenvironment. See Sedimentary facies and palaeocurrents in the Boss Point Formation, southeastern New Brunswick, abstract Bull. Amer. Assoc. Pet. Geol., vol. 47, No. 2, pp. 361-362, 1963.

926. Lowes, B.E., Geol. Surv. Can.:
Chilliwak Group, Harrison Lake area, British Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 74-75.
927. MacQueen, R.W., Geol. Surv. Can. (part time):
Mississippian stratigraphy and petrology of Bow and Highwood River areas, Alberta, 1963-65; Ph.D. thesis, Univ. of Toronto.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 102-104.
Mount Head Formation (Mississippian), Alberta Rocky Mountains and Foothills.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 62-65.
928. MacQueen, R.W., Price, L.L., Geol. Surv. Can.:
Studies of evaporite-carbonate-clastic suite, Souris River Formation (Devonian), Saskatchewan.
Seeks a better understanding of the origin of the Souris River Formation cycles, and relations of the rock types within them.
929. Martin, H.L., Geol. Surv. Can.:
Mississippian subsurface geology, Pembina area, Alberta.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 65-66.
Geology of the Mississippian Elkton Member in the Edson area, Alberta, 1965-67.
930. Monger, J.W.H., Geol. Surv. Can.:
Structure and Permian stratigraphy of part of Atlin Horst, Dease Lake, British Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 41-42.
931. Moore, R.G., Acadia Univ.:
Stratigraphy of the Windsor Group, Nova Scotia, 1964-.
The Lower Windsor Group of the Minas Sub-basin and Upper Windsor Group of the Stellarton Gap are being studied at present.
932. Mountjoy, E.W., McGill Univ. and Geol. Surv. Can.:
Carboniferous stratigraphy and petrology of northern Jasper Park, Alberta, 1959-.
Regional study of Carboniferous stratigraphy to determine extent, thickness and petrography of various units. See The

Permo-Carboniferous succession of Mount Greenock and northern Jasper Park; Bull. Can. Petrol. Geol., vol. 13, pp. 340-345, 1965.

Upper Devonian Miette and Ancient Wall reef complexes, 1960-.

Investigation includes a study of gross stratigraphic relationships, petrology and detailed examination of reef margins in order to determine depositional history and environments. A study was also undertaken with Dr. C.W. Stearn to investigate in more detail the stratigraphy petrography and palaeoecology of the southern margin of the reef. Comparisons with subsurface reefs are being investigated. See Geol. Surv. Can., Paper 61-31, 1962.

Cambrian stratigraphy and petrology of northern Jasper Park, Alberta, 1960-.

Regional study of Cambrian stratigraphy to determine distribution thickness and petrography of various units. A study of Ordovician strata and the pre-Devonian unconformity is also included. See Geol. Surv. Can., Paper 61-31, 1962.

933. Nautiyal, A.C., Univ. of Saskatchewan:

Upper Devonian (Frasnian) microfaunas and biostratigraphy of Saskatchewan and Alberta, 1966-69; Ph.D. thesis.

934. Schenk, P.E., Dalhousie Univ.:

Study of the depositional environment, fauna, and flora of the Windsor Group (Mississippian) of Nova Scotia, 1963-.

This study is concerned with field relations, carbonate petrology, identification of fauna and flora, palaeoecology, insoluble-residue analysis, and elemental analysis to interpret palaeo-environment and chronostratigraphy of the Windsorian Stage (Mississippian). See The Macumber Formation of the Maritime Provinces, Canada - a Mississippian analogue to Recent strandline carbonates of the Persian Gulf: Jour. of Sedimentary Petrology (in press).

935. Streeton, D.W., Wardlaw, N.C., Univ. of Saskatchewan:

Devonian Prairie Evaporite Formation in the Yorkton area, Saskatchewan, 1966-67; M.Sc. thesis (Streeton).

Bromine and rubidium distribution in minerals of the potash ore beds is being investigated, and in combination with petrographic data provides evidence for the relationships between various salt minerals. The area includes a large solution channel and the effects of solutioning on adjacent and associated beds can be examined. Also, the area is situated at the basin margin and the wedging out of the salt formation can be studied with a view to establishing whether this is a depositional edge, or one caused by subsequent erosion.

936. Taylor, G.C., MacKenzie, W.S., Geol. Surv. Can.:
Devonian stratigraphy of northeast British Columbia, 1960-66.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 66-67.
937. Uyeno, T.T., Geol. Surv. Can.:
Biostratigraphic study of Lower and Middle Devonian of southwestern Ontario, 1966.
938. van de Poll, H.W., New Brunswick Dept. of Natural Resources:
Sedimentation and palaeocurrents in the Carboniferous basins of New Brunswick, 1965-.
The study of sedimentation and palaeocurrents in the Carboniferous basins of New Brunswick is designed to gain a better understanding of the stratigraphy, tectonics and basin configuration.
939. Waring, M., Acadia Univ.:
Stratigraphy and structure of section of Windsor Group near Avondale, Hants County, Nova Scotia, 1965-66; M.Sc. thesis.
940. Wheeler, H.E., Univ. of Washington, Smith, L., Queen's Univ.:
Devonian versus intrinsic stratigraphy, 1966-67.
A critique of several of the basic assumptions underlying the concept of the "Devonian System" as presently understood.
941. Yole, R.W., and graduate students, Carleton Univ.:
Stratigraphy, sedimentology and palaeontology of Sicker Group, Vancouver Island, 1961-67.
Sedimentological investigation at St. Clair River Delta, Ontario, 1966-70.

Mesozoic

942. Acham, P., Univ. of Alberta:
The Mannville Group (Lower Cretaceous) in the Wintering Hills - Hussar - Carbon Gas area, Central Alberta, 1966-67; M.Sc. thesis.
943. Binda, P.L., Univ. of Alberta:
The Whitemud and Battle Formations of Alberta, 1964-67; Ph.D. thesis.
Emphasis is on genesis of deposits and correlation.
944. Brooke, M.M. (Miss), Univ. of Saskatchewan:
Jurassic microfossil sequences and biostratigraphy of Saskatchewan and Montana, 1965-67; M.Sc. thesis.

945. Caldwell, W.G.E., North, B.R., McLean, J.R., Univ. of Saskatchewan:
Stratigraphy of the Cretaceous system in Saskatchewan, 1959-.
See Foraminiferal zones in the Cretaceous white-speckled shales of eastern Saskatchewan; Geol. Soc. America, Ann. Program for meeting in San Francisco, November, 1966 (Abstract).
946. Frebold, H., Geol. Surv. Can.:
Stratigraphic-palaeontologic study of Jurassic of Canada, 1959-.
The basal beds of the Lower Jurassic in the Foothills and Rocky Mountains.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 200-201.
947. Gibson, D.W., Geol. Surv. Can.:
Triassic stratigraphy between the Athabasca and Brazeau Rivers, Alberta, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 101-102.
948. Ibbotson, C.J. (Miss), Geol. Surv. Can.:
Correlation of the Kneehills Tuff zone of southwestern Alberta by means of subsurface data, 1966-67.
949. Irish, E.J.W., Geol. Surv. Can.:
Stratigraphy of near-surface rocks of plains of Alberta and Saskatchewan, 1963-.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 102.
950. Jeletzky, J.A., Geol. Surv. Can.:
Stratigraphy and palaeontology of Lower Cretaceous and Upper Jurassic rocks of Taseko Lakes and Pemberton map-areas, British Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 65-68.
Biochronology of lower part of Nanaimo Group (Mid-Upper Cretaceous), eastern Vancouver Island, British Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 69-70.
Jurassic-Cretaceous transition beds, Pacific slope of North America, 1966-67.
To evaluate the stratigraphic position and age of fossiliferous marine upper Tethonian and lower Berriasian rocks in western Canadian Cordillera.
951. Mountjoy, E.W., McGill Univ. and Geol. Surv. Can.:
Mesozoic stratigraphy of northern Yukon, 1961-.
A regional study of the Mesozoic stratigraphy of northern Yukon as a part of Operation Porcupine of the Geological Survey.

Includes determination of gross stratigraphic relationships, petrography and depositional history of these rocks. See Upper Cretaceous and Tertiary stratigraphy, northern Yukon Territory and District of Mackenzie; Geol. Surv. Can. (in press).

952. Ollerenshaw, N.C., Geol. Surv. Can.:
Blairmore Group and Kootenay Formation between Bow and Clearwater Rivers, 1966-.
953. Proctor, R.M., Geol. Surv. Can.:
Triassic Baldonnel Formation, Jedney-Laprise Creek area, northeastern British Columbia.
See Geol. Surv. Can., Paper 66-2, 1966, p. 69.
954. Tipper, H.W., Geol. Surv. Can.:
Mesozoic stratigraphy of Skeena River region, British Columbia (Operation Skeena River), 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 93-94.
Stratigraphy and palaeontology of Toarcian to Oxfordian beds of Taseko Lakes area, British Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 92-93.
955. Tozer, E.T., Geol. Surv. Can.:
Triassic biostratigraphic studies in northeastern British Columbia, 1960-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 95-96.
956. Trettin, H.P., Geol. Surv. Can.:
Lower Triassic "Tar Sands", northwestern Melville Island, Arctic Archipelago.
See Geol. Surv. Can., Paper 66-2, 1966, pp. 71-73.
957. Usher, J.L., Mothersill, J.S., Queen's Univ.:
The discontinuous Halfway Formation of the Milligan Creek area, British Columbia, 1965-66; Ph.D. thesis (Mothersill).
958. Vanden Berg, A., Research Council of Alberta:
Groundwater movement and groundwater chemistry in the Hand Hills-Bullpound Creek area, Alberta, 1963-67.
Includes detailed mapping of the chemical quality of the groundwater; mapping of groundwater discharge and recharge areas from surface indications and piezometric data; stratigraphy of the Edmonton and Paskapoo Formations from bore-hole data and bedrock exposures; investigation into the origin of anomalous calcium-magnesium ratios observed in groundwater through chemical analysis of bore-hole samples.

959. Westermann, G.E.G., McMaster Univ.:
The Triassic-Jurassic marine transition of coastal central Chile.
Structure and biostratigraphy of the Pine River Bridge Section,
British Columbia.

Cenozoic

960. Monger, J.W.H., Geol. Surv. Can.:
Tertiary rocks of Greenwood area, British Columbia, 1966.
961. Rutter, N.W., Muller, J.E., Geol. Surv. Can.:
Extensive Tertiary section, Parsnip River valley, British
Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 86.
962. Vonhof, J.A., Univ. of Saskatchewan:
Tertiary gravels and sands of Western Canada, 1966-67; Ph.D.
thesis.
See The Cypress Hills Formation and its reworked deposits
in southwestern Saskatchewan; Alta. Soc. Pet. Geologists
Guidebook 15th Ann. Field Conf., Part 1, Cypress Hills Plateau,
pp. 142-161, 1965.

General Problems

963. Belyea, H.R., Mackenzie, W.S., Geol. Surv. Can.:
Organic growth in carbonate tongues, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 97-100.
964. Benson, D.G., Geol. Surv. Can.:
Stratigraphy of Antigonish Basin, Nova Scotia, 1966-.
965. Burk, C.F., Geol. Surv. Can.:
Computer program for processing subsurface stratigraphic data,
1966-.
See Geol. Surv. Can., Paper 66-2, 1966, p. 58.
966. Chi, B., Univ. of Alberta:
Correlation of Upper Cretaceous and Palaeocene sediments in
southern Alberta and southwestern Saskatchewan, 1964-68;
Ph.D. thesis.
Emphasis is on petrographic (heavy mineral and thin section)
work.

967. Howie, R.D., Geol. Surv. Can.:
Subsurface and regional studies in Eastern Canada as related to oil and gas, 1960-.
968. Lerbekmo, J.F., Univ. of Alberta:
Correlation of Cretaceous-Tertiary continental deposits in Alberta, 1962-.
Emphasis on petrographic study and radiometric dating. See Heavy minerals and the Cretaceous-Tertiary boundary in Alberta, Canada; Proceedings of the XXII International Geological Congress, New Delhi, 1964, Sec. 3.
969. McCabe, H.R., Manitoba Mines Branch:
Stratigraphic map series and report (Palaeozoic and Jurassic), 1965-67.
The stratigraphic map series is a continuing project, as maps will be periodically up-dated and revised; it is expected that maps will be available for all formations by 1967. A report on structural and stratigraphic anomalies in the Palaeozoic formations of southwestern Manitoba based on the stratigraphic map series should also be completed in 1967. See Stratigraphic Map Series (23 new and revised maps for Palaeozoic formations) issued by Manitoba Mines Branch.
970. Nassichuk, W.W., Geol. Surv. Can.:
Permo-Carboniferous and Mesozoic strata of northern Ellesmere Island, Northwest Territories, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 10-12 and Paper 66-2, 1966, p. 66.
971. Norford, B.S., Geol. Surv. Can.:
Biostratigraphic studies, northeast Ellesmere Island, Northwest Territories, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 12.
972. Norris, D.K., Geol. Surv. Can.:
Stratigraphic and structural studies in the southeastern Canadian Cordillera, 1964-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 208-209.
973. Russell, L.S., Royal Ontario Museum:
Correlation of Cretaceous and Tertiary formations of southern Saskatchewan and Alberta with those of northern Montana, 1965-68.
A number of discrepancies in the accepted correlation of Cretaceous and Tertiary formations across the International

Boundary will be investigated, mainly by the collecting and identification of fossils from critical horizons in both Canada and the United States. See Cretaceous non-marine faunas of north-western North America, Royal Ontario Museum, Life Sci. Contrib. 61, 24 pp., 1964.

974. Snead, R.G., Univ. of Alberta:
Upper Cretaceous-Palaeocene boundary in southern Alberta,
1964-67; Ph.D. thesis.
Emphasis of study is on palynology.
975. Stelck, C.R., Warren, P.S., Univ. of Alberta:
Stratigraphic studies of Western Canada.
See Geological history of Albertain Hardy, W.G. (ed.),
Alberta, A Natural History, Centennial Project, M. Hurtig,
Edmonton.
976. Trettin, H.P., Geol. Surv. Can.:
Pre-Mississippian "Eugeosynclinal" rocks in selected areas of
northern Ellesmere Island, Northwest Territories, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 13-18.

STRUCTURAL GEOLOGY

British Columbia, Alberta, Saskatchewan, and Manitoba

977. Ambrose, J.W., Bielenstein, H.U., Queen's Univ.:
Rundle thrust sheet, Banff, Alberta, 1965-67; Ph.D. thesis
(Bielenstein).
This study was undertaken under the field direction of Dr.
R.A. Price, Geological Survey of Canada. Several thrusts are
involved in the area, separated by fault slices; includes detailed
statistical study of some of the minor structures associated with
the larger features. See Geol. Surv. Can., Paper 67-1A, 1967,
pp. 100-101.
978. Ambrose, J.W., Cook, D.G., Queen's Univ.:
The Stephen-Dennis zone, Field, British Columbia, 1964-67;
Ph.D. thesis (Cook).
This study was undertaken under the field direction of Dr.
R.A. Price, Geological Survey of Canada.

979. Anderson, D.T., Univ. of Manitoba:
Photogeology for Project Pioneer area, Manitoba, 1965-70.
Project Pioneer is a joint University of Manitoba - Manitoba Mines Branch geological study a portion of eastern Manitoba centred on Bissett. The photogeological research is an integral part of this study.
980. Arthur, J.C.L., Univ. of Manitoba:
Structural studies of the San Antonio Formation and underlying volcanic rocks, Manitoba, 1966-67; M.Sc. thesis.
981. Baer, A.J., Geol. Surv. Can.:
Structural studies in gneissic terrain, Fond-du-Lac, Saskatchewan, 1966.
982. Bell, K.W., Univ. of Manitoba:
Structural studies of the San Antonio conglomerate, Manitoba, 1965-67; M.Sc. thesis.
983. Boetzkes, P.C., Charlesworth, H.A.K., Univ. of Alberta:
Structural analysis of joints and microjoints in the Cardium sandstone of the central Alberta Foothills, 1966-68; M.Sc. thesis (Boetzkes).
See Jointing in folded Cardium sandstones along the Bow River, Alberta; Canadian Jour. Earth Sciences, vol. 3, pp. 579-596, 1966.
984. Coates, J., Univ. of British Columbia:
Structure of Lower Cretaceous rocks in Manning Park Area, Cascade Mts., British Columbia, 1964-66; Ph.D. thesis.
See Geol. Surv. Can., Paper 66-1, 1966, p. 55.
985. Friesen, M., Univ. of Saskatchewan:
Mechanical properties of Lynn Lake rock as an aid to mining, 1966-67; M.Sc. thesis.
Determination of elastic properties of rock specimens from the results of static stress-strain tests.
986. Fyles, J.T., British Columbia Dept. of Mines and Petroleum Resources:
Jordan River area, British Columbia, 1964-67.
Study of structure and lead-zinc mineralization in rocks of the Shuswap metamorphic complex. Part of the Cordilleran Structure Project.

987. Fyson, W.K., Univ. of Ottawa:
Structural and stratigraphic relations of Palaeozoic and Mesozoic rocks in the Shuswap Lake area, British Columbia, 1965-67.
See Structures in the Mt. Ida, Cache Creek, and Monashee Groups, Shuswap Lake area; Geol. Surv. Can., Paper 66-1, pp. 58-59.
Relation of minor to major structures in the Maritime Provinces, 1962-.
See Structures in the Lower Palaeozoic Meguma Group, Nova Scotia; Geol. Soc. Am. Bull., vol. 77, pp. 931-944, 1966.
988. Haugh, I., Manitoba Mines Branch:
Structural studies in Rice Lake-Beresford Lake area, Manitoba, 1966-71 (Project Pioneer).
The tectonic evolution of the area including study of the metamorphism of deformed rocks.
989. Imrie, A.S., Charlesworth, H.A.K., Univ. of Alberta:
Analysis of underground powerhouse and at the Portage Mountain damsite, Hudson Hope, British Columbia, 1965-67; M.Sc. thesis (Imrie).
990. Kornik, L.J., Univ. of Manitoba:
Regional structural compilation in northern Manitoba, 1965-69;
Ph.D. thesis.
991. Leech, G.B., Geol. Surv. Can.:
Kananaskis Lakes and Canal Flats, 1 inch to 4 miles, 1962-65.
See Geol. Surv. Can., Paper 66-1, 1966, pp. 65-66.
Cretaceous strata in the west face of the Rocky Mountains, British Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 72-73.
992. Lowes, B.E., Univ. of Washington:
Chilliwak Group, Harrison Lake area, British Columbia, 1966;
Ph.D. thesis.
Structure and metamorphism in the northern continuation of the Cascade orogen of Washington. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 74-75.
993. McMillan, W.J., Carleton Univ.:
Ratchford Creek area, Monashee Mountains, British Columbia, 1965-66; Ph.D. thesis.
Structure of the core and enveloping rocks on the west side of the Frenchman's Cap gneiss dome. See Geol. Surv. Can., Paper 67-1A, 1967, p. 75.

994. Monger, J.W.H., Geol. Surv. Can.:
Structure and Permian stratigraphy of part of Atlin Horst, Dease Lake, British Columbia, 1966.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 41-42.
995. Mountjoy, E.W., McGill Univ.:
Structure of Front and Main Ranges, Northern Jasper Park, Alberta, 1957-.
Extent, geometry and development of fold and thrust structures, relationships of folds with abrupt termination of thrusts, interrelations of hanging-wall and foot-wall structures. See Geol. Surv. Can. Map 47, 1963.
996. Ollerenshaw, N.C., Geol. Surv. Can.:
Structural studies of the Panther Dome, Lake Minnewanka area, Alberta.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 104-105.
997. Preto, V.A.G., McGill Univ.:
Structure and petrography of the Grand Forks Group, British Columbia, 1965-67; Ph.D. thesis.
998. Reesor, J.E., Blattner, P., Geol. Surv. Can.:
Thor-odin gneiss dome, west upper Arrow Lake, British Columbia, 1964-65.
See Geol. Surv. Can., Paper 66-1, 1966, pp. 78-80, Paper 66-2, 1966, pp. 44-48.
999. Richards, T., Univ. of British Columbia:
Study of the Chilliwack batholith and environs, British Columbia; Ph.D. thesis.
1000. Robinson, J.E., Charlesworth, H.A.K., Univ. of Alberta:
Structural analysis of folding in the Interior Plains of Alberta, 1966-68; Ph.D. thesis (Robinson).
1001. Ross, J.V., Kellerhals, P., Sinclair, A.J., Libby, W., Univ. of British Columbia:
Structural and petrological studies in Slocan area, British Columbia.
1002. Simony, P., Univ. of Calgary:
Small scale structures in Moose Dome, Alberta, 1964-67.

1003. Simony, P., Ellison, E.H., Wind, G., Univ. of Calgary:
Geology of Dogtooth Mountains, British Columbia, 1965-69;
M.Sc. theses (Ellison and Wind).
Detailed study of the structural geometry, stratigraphy,
metamorphism and tectonic history of the northern portion of the
Dogtooth Mountains and adjacent portions of the Rocky Mountain
Trench. Correlation of tectonic events in Dogtooth Mountains
with those in Selkirk and Rocky Mountains.
1004. Stauffer, M.R., Wardlaw, N.C., Hoque, M., Univ. of Saskatchewan:
Structural geology of the gypsum deposit near Gypsumville,
Manitoba, 1966-67; M.Sc. thesis (Hoque).
1005. White, W.R.H., Bone, M.N., Dominion Observatory:
Crustal studies in the Cordillera, British Columbia and Alberta -
a continuing project.
A program of seismic refraction studies to outline the major
crustal and upper mantle features of the Cordilleran region.
Observations parallel to the West Coast have been published, and
a reversed profile from Merrit to Quesnel completed. An
unreversed profile from Revelstoke to Vancouver Island was
conducted in 1966. See A seismic refraction and gravity study of
the earth's crust in British Columbia; Bull. Seism. Soc. Am.,
55, p. 463, 1965.
1006. Zaturecky, J.W., Charlesworth, H.A.K., Univ. of Alberta:
Structure analysis of cleavage in Proterozoic rocks near Jasper,
Alberta, 1966-; M.Sc. thesis (Zaturecky).

Maritime Provinces

1007. Brown, R.L., Helmstaedt, H., Lee, D., Univ. of New Brunswick:
Detailed structural studies in the Bay of Fundy Region of south-
ern New Brunswick, 1965- ; Ph.D. thesis (Helmstaedt),
M.Sc. thesis (Lee).
See Upper Devonian Plant Fossils from Beaver Harbour,
N.B.; Maritime Sediments (in press).
1008. Church, W.R., Univ. of Western Ontario:
Geology of the Burlington Peninsula and adjoining areas, Northeast
Newfoundland, 1963-.
See Structural evolution of Northeast Newfoundland: compar-
ison with that of the British Caledonides. Maritime Sediments,
vol. 1, 10-14, 1965.

1009. Crowell, C., Acadia Univ.:
Stratigraphy and structure of a section of the Windsor Group on the
Meander River, Hants County, Nova Scotia, 1965-67; M.Sc.
thesis.
1010. Cumming, L.M., Howie, R.D., Geol. Surv. Can.:
Offshore structures, Mirimachi Bay, New Brunswick, 1966.
1011. Hay, P.W., New Brunswick Dept. of Natural Resources:
Stratigraphy and structure of the Silurian Mascarene volcanics,
Charlotte county, New Brunswick, 1965-68.
Detailed field mapping to extend the Silurian stratigraphy as
deciphered in Maine into New Brunswick, to interpret the struc-
ture of volcanics, and to determine favourable localities for
detailed mineral exploration.
1012. Kennedy, M.J., Geol. Surv. Can. (N.R.C. Postdoctorate Fellow):
Structural study of the Fleur de Lys Group, Newfoundland,
1966-67.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 180-182.
1013. Robertson, W.A., Roy, J.L., Park, J.K., Dominion Observatory:
Fisset Brook Formation (Devonian) Cape Breton, Nova Scotia,
1965-67.
An investigation of the pole position for the Devonian-
Carboniferous boundary by study of volcanic and sedimentary rocks
from Cape Breton.
1014. Roy, J.L., Robertson, W.A., Park, J.K., Dominion Observatory:
Palaeomagnetism of Shepody Formation, New Brunswick, 1964-67.
Thermal study of the magnetic spectrum in order to identify
the primary magnetic component, and from it to determine the
sense of the field and the position of the pole in mid-Carboniferous
time.
History of the Carboniferous palaeomagnetic pole from rocks from
the Maritimes of Canada, 1964-68.
Review of the magnetic field in North America in Carboniferous
time as displayed by palaeomagnetic results from formations in the
Maritime Provinces.
1015. Stevens, G.R., Acadia Univ.:
Primary fabric, structures and petrology of Triassic basalt flows,
Bay of Fundy shore, Nova Scotia, 1966-.
An attempt to relate fabric, structures and petrologic varia-
tions to flow and emplacement directions of Triassic basalts and
possible feeder dykes and vents; design of hypersonic device to

detect fabric or preferred orientation in basalt by means of selective absorption; eventual application of such techniques to flow-fabric of Devonian granites.

1016. Stevens, R., Univ. of Western Ontario:
The Taconic orogeny, wildflysch, and gravity sliding in western Newfoundland, 1966-69; thesis project.
1017. Waring, M., Acadia Univ.:
Stratigraphy and structure of section of Windsor Group near Avondale, Hants County, Nova Scotia, 1965-66; M.Sc. thesis.
1018. Weaver, D.F., Dominion Observatory:
Gravity survey of Newfoundland, 1964-67.
Analysis of gravity data reveal a major gravity gradient across a line that trends northeasterly over the southern part of the Great Northern Peninsula. This line may mark the boundary between the Grenville and Appalachian geological provinces. The anomalies north of this line average about 30 mgal less than the anomalies in the southern area. Seismic work suggests a thinner lower density crust in the north where the anomalies are negative, and a thicker higher density crust in the southern area where the anomalies are generally positive. Calculations show that the results are compatible with the gravity data if density variations in the upper mantle contribute to the gravity field. In neither area does there appear to be any dependence of Bouguer anomaly on elevation.
A correlation of the local Bouguer anomalies with the surface geology suggests that granite is the prime cause of the negative anomalies of Newfoundland. The sediments, most of which are metamorphosed, appear to have very little effect on the gravity field. Most of the positive anomalies of Newfoundland correlate with large bodies of diorite or with gabbroic and ultrabasic intrusions. It is suggested that many of the longer wave-length regional variations in the gravity field are produced by changes in the crustal parameters at depth. See Preliminary results of the gravity surveys of the Island of Newfoundland (with maps); Gravity Map Series, Dom. Obs. Maps Nos. 53, 54, 55, 56, 57, 1966.

Northwest Territories and Yukon

1019. Barr, K.G., Berry, M.J., Dominion Observatory and Polar Continental Shelf Project:
Crustal studies in Canadian Arctic, 1962-.
Refraction seismic profiles in the Arctic Archipelago with special interest in anomalous features in the western Arctic Islands

and the Continental margin. Attempts are being made to relate the seismic refraction results to other geophysical results in the same area. See Deep seismic refraction investigation in the Canadian Arctic Archipelago; Geophysics, 30, p. 87, 1965.

1020. Barr, K.G., Tyrlik, W.T., Kanasewick, E.R., Cumming, G.L., Piche, W., Berry, M.J., Dominion Observatory and Univ. of Alberta:

Crustal studies in Yellowknife area, Northwest Territories, 1966-68.

An experiment using 18 shot points and eleven observing crews was undertaken in 1966 to determine the sub-Moho velocity and time terms at points inside and outside the Slave Province, and to shoot a profile through Yellowknife at distances bracketing the cross over distance, across the Bear-Slave provincial boundary and across the McDonald fault.

1021. Brown, L., Univ. of New Brunswick:

Structural studies in the Precambrian basement of the Boothia Peninsula, Northwest Territories, 1965-67.

1022. Reinhardt, E.W., Geol. Surv. Can.:

McDonald fault, Great Slave Lake, Northwest Territories, 1965-66.

A study of the gneisses and mylonites between the fault and the Nonacho Basin. See Geol. Surv. Can., Paper 67-1A, 1967, pp. 40-43.

Ontario

1023. Brisbin, W.C., Univ. of Manitoba:

Deformational environments in the Superior Province in Northwest Ontario.

Examines the variation in the nature of granitic diapirs as related to geometric, kinematic, and dynamic properties of the deformational environments at different levels of the granitic crust as exposed in the area.

1024. Carmichael, D.M., Geol. Surv. Can.:

Structural studies, Hastings area, Ontario, 1 inch to 1 mile, 1965-66; Ph.D. thesis.

See Geol. Surv. Can., Paper 67-1A, 1967, pp. 133-134.

1025. Fabbri, A.G., Univ. of Ottawa:
Structural analysis of Grenville rocks, Madoc area, Ontario,
1967-69; Ph.D. thesis.
1026. Henderson, J.R., McMaster Univ.:
The structural and metamorphic history of the boundary between
the Grenville and Southern structural provinces in an area
southeast of Sudbury, Ontario, 1963-67; Ph.D. thesis.
1027. Hornal, R.W., Boyd, J.B., Dominion Observatory:
Gravity survey of District of Mackenzie, Northwest Territories,
1966-.
Some 4,696 stations were established to investigate the
gravity field over the Bear and Slave geological provinces and
also to delineate the extension of the Coppermine gravity high
outlined during the 1962 field season. The survey area included
some 250,000 square miles between latitudes 62°N and 70°N and
between longitudes 102°W and 120°W. About 2,300 rock samples
were collected and catalogued. The results and a preliminary
analysis are being prepared for publication in the Gravity Map
Series.
1028. Hsu, M.Y., McMaster Univ.:
Relationship of joint orientations and densities to bed thickness
and composition, 1966-68; M.Sc. thesis.
Area of study is primarily the Niagara Escarpment from
Orangeville to Niagara Falls, Ontario.
1029. Kendrick, G., Univ. of Toronto:
A study of structural fabric in Grenville rocks of an area in
southeastern Ontario, 1964-66; M.Sc. thesis.
Study of minor folds developed in siliceous layers within
marble at the core of the Clare River syncline suggests that
initial stages of their deformation may have involved buckling.
This interpretation is supported by such evidence as a nearly
constant ratio of fold wavelength to thickness of siliceous layers
within the folds. Relations can be deduced concerning the mean
ductility of the rocks and the ductility contrast between siliceous
layers and surrounding marble during deformation.
1030. Manchee, E.B., Weichert, D., Whitham, K., Dominion Observatory:
Array seismology, 1962-.
The continuous processing of seismic signals recorded on a
medium aperture crossed array of nineteen seismometers in
order to study small magnitude events, criteria to distinguish
explosion and earthquakes, and lateral and vertical upper mantle

discontinuities. A primary purpose is to increase the signal-to-noise ratio in order to study propagation paths, the earthquake signal at the focus and crustal reverberation. See Digital experiments at twice real-time speed on the capabilities of the Yellowknife Seismic Array; Geophys. J.R.A.S., "Symposium on Geophysical Theory and Computers" Issue, 1966.

1031. Moore, J.M. Jr., Sethuraman, K., Carleton Univ.:
Petrology and structure of metasedimentary and metavolcanic rocks, Barrie-Clarendon area, south-eastern Ontario, 1966-68; Ph.D. thesis (Sethuraman).
The objects are to establish structure, metamorphic zoning, and, in the lower-grade (greenschist-low amphibolite) rocks, the stratigraphy.
1032. Norris, D.K., Larochelle, A., Geol. Surv. Can.:
Tectonic analysis, northern Cordillera, Northwest Territories and Yukon, 1966-.
See Geol. Surv. Can., Paper 67-1A, 1967, pp. 45-46 and p. 218.
1033. Ramachandra Rao, D.S., Univ. of Ottawa:
Structural analysis of Grenville rocks, E. Bancroft area, Ontario, 1967-69; Ph.D. thesis.
1034. West, G.F., Halls, H., Univ. of Toronto:
Structure of the Keweenaw Basin and the earth's crust in the vicinity of Lake Superior, 1963-67; Ph.D. thesis (Halls).
The results of the 1963 Lake Superior Seismic experiment showed that the crust of the earth is abnormally thick under the eastern part of Lake Superior, and that the late Keweenaw sedimentary basin (in which the lake lies) is much deeper than was expected. Much additional geophysical data is now available and a much improved picture of the structure of the region should be obtained. Combined geological and geophysical studies are being undertaken to this end.
1035. Young, G.M., Church, W.R., Univ. of Western Ontario:
Stratigraphy, structure and sedimentology of Huronian rocks of the region north of Manitoulin Island, Lake Huron, Ontario, 1964-67.
See The Huronian system in the Sudbury District and adjoining areas of Ontario: a review. Proc. Geol. Assoc. Can. vol. 17, pp. 65-82, 1966.

Quebec

1036. Ambrose, J.W., Brown, A., Queen's Univ.:
Geology of Opemiska mine, Quebec, 1961-67; Ph.D. thesis (Brown).
A study of the detailed structure of the Opemiska Mine area including various statistical approaches to the study of small folds and other minor structures.
1037. Ambrose, J.W., Sharma, K.N.M., Queen's Univ.:
A structural study of Baskatong Reservoir, Quebec, 1964-68; Ph.D. thesis (Sharma).
A petrofabrics study of specimens associated with a fault. This forms part of an aerial study made by R.S. Jacoby and Kamal Sharma working jointly under the sponsorship of the Quebec Department of Natural Resources.
1038. Béland, J., Université de Montréal:
Etude tectonique et stratigraphique du secteur québécois de la chaîne appalachienne, 1965-68.
Analyse tectonique du socle précambrien au voisinage des massifs anorthositiques dans la province tectonique de Grenville, 1965-68.
1039. Béland, J., Gentile, F., Université de Montréal:
Structural and stratigraphic study of the Lemieux Dome, Gaspé, Québec, 1965-67; M.Sc. thesis (Gentile).
A study of the origin of this dome and the copper mineralized breccias it contains.
1040. Béland, J., Martignole, J., Hocq. M., Université de Montréal:
Structural and petrological study of the Grenville rocks exposed in the Shawinigan area, Quebec, 1964-68; M.Sc. thesis (Hocq).
This study is aimed at clarifying the mode of emplacement of the anorthosite-mangerite complexes from a structural viewpoint. An attempt is made to relate deformation, crystallization, recrystallization in time.
1041. Currie, K.L., Geol. Surv. Can.:
Manicouagan crater, Quebec, 1963-65.
See Geol. Surv. Can., Paper 67-1A, 1967, p. 165.
1042. Gilmore, R., McGill Univ.:
Phillipsburg Rosenberg slices, Quebec, 1967-68; M.Sc. thesis.

1043. Globensky, Y., Quebec Dept. of Natural Resources:
Geology of the Drummondville area, Quebec, 1965-67.
Semi-detailed mapping with special emphasis on the structure.
1044. Gross, W.H., Fitzgerald, A.C., Graham, R.J., Rucklidge, J.C.,
Univ. of Toronto:
Application of Au/Ag ratios to a fault displacement problem,
Bourlamaque, Quebec, 1965-67.
Gold-silver ratios were obtained from annual mint returns from the Lamaque and Sigma mines. These values are being compared to ratios obtained by fire assay of stope samples and electron microprobe analyses of gold particles extracted from the samples. The Lamaque and Sigma mines lie on opposite sides of a fault zone. It is hoped that the throw on the fault can be determined by matching the Au/Ag values plotted against depth for each mine.
1045. Grove, E.W., McGill Univ.:
Petrochemical and structural studies, Lake Miquelon, Quebec, 1963-67; Ph.D. thesis.
1046. Hubert, C., Quebec Dept. of Natural Resources:
Sedimentological, stratigraphical and structural study of the Cambro-Ordovician rocks exposed along the south shore of the St. Lawrence River, Quebec, 1961-69.
See Tectonics of parts of the Sillery in the Chaudiere-Kamouraska segment of the Quebec Appalachians, Trans. Roy. Soc. Canada, 1966.
1047. Kumarapeli, P.S., McGill Univ.:
Tectonics of the St. Lawrence lowlands, 1966-67; Ph.D. thesis.
1048. Murtaugh, J.G., Quebec Dept. of Natural Resources (part time),
Univ. of Ohio:
Lac Manicouagan area, 1964-67.
Part of a continuing joint project with Quebec Department of Natural Resources and the Geological Survey of Canada to determine the nature and origin of the structure bounded by the Manicouagan and Mouchalagan Lakes which may be a volcano-tectonic feature or the result of meteorite impact.
1049. Neilson, J.M., Queen's Univ.:
Grenville Front in the Mistassini region, Quebec - a continuing project.
See Lake Albanel iron range; CIMM Bull., vol. 56, No. 609, 1963.

1050. Robertson, W.A., Dominion Observatory:
Palaeomagnetism of Manicouagan Lake, Quebec, 1964-67.
A study of the dacitic annulus of the ring feature; examination of its magnetic stability; comparison of the calculated pole with other Mesozoic pole positions.
1051. Robertson, W.A., Roy, J.L., Park, J.K., Dominion Observatory:
Palaeomagnetism of Manicouagan Formation, Quebec, 1965-67.
Detailed study of stability of a mid-Carboniferous formation, to test the possibility of within-Carboniferous polar movement.
1052. Sikander, A.H., Univ. of Ottawa:
Structural analysis of the Lower Palaeozoic rocks of western Gaspé, Quebec, 1964-67; Ph.D. thesis.
1053. Williams, M.C., McGill Univ.:
Study of a fold belt in the Snegamook Lake map area, Quebec, 1966-68.

General Problems

1054. Andrieux, P., Clark, J.F., Dominion Observatory:
Study of meteoritic crater by electrical prospecting method, 1964-67.
1055. Brisbin, W.C., Univ. of Manitoba:
Deformational environments in the western Superior Province of the Precambrian Shield, 1964-69.
The project consists of geometric, kinematic and dynamic structural analysis in three deformational environments considered to be representative of different levels in the granitic crust.
1056. Brisbin, W.C., Univ. of Manitoba, and Turek, A.C., Haugh, I., Scoates, R.F.J., Manitoba Mines Branch:
Development of computer treatment methods for field observations and programming for their retrieval, decoding and plotting (Project Pioneer).
1057. Brisbin, W.C., Turek, A.C., Univ. of Manitoba, Haugh, I., Manitoba Mines Branch:
Computer analysis of structural orientation data, 1966-.
This study which is part of Project Pioneer consists of development of a structural field data sheet to ensure complete and consistent structural observations and which serves as a

document for machine input; and development of programmes for processing structural orientation data.

1058. Chagnon, J. Y., Quebec Dept. of Natural Resources:

Clays and ground slides, 1965-.

A continuing program of research on clays and ground slides including study of areas where sliding has occurred and collection of clay samples for a determination of their physical properties.

1059. Clifford, P.M., McMaster Univ.:

Structural and metamorphic development in a "Keewatin" greenstone belt, 1966-.

Analysis of abundant field data indicates triple folding of a stratovolcanic pile and its associated sediments, coupled with highly variable regional metamorphism and contact metamorphism.

Mechanical behaviour of the Precambrian crust, 1966-.

An hypothesis of progressive crustal thickening in the Precambrian is being investigated by analytical techniques. Experimental rock deformation, 1966-.

Investigation of the effect of strain rate on mechanical behaviour of sandstones.

1060. Coates, D.F., Gyenge, M., Waranica, K., Casey, F.L., Mines

Branch, Dept. of Energy, Mines and Resources:

Rock slope stability, 1960-.

A number of projects are being conducted to determine the mechanics of failure in rock slopes. Basic studies are being pursued into the stress distribution occurring in typical slope geometries. Mathematical and photoelastic techniques are being used for this work.

1061. Cochrane, T.S., Parsons, R.C., Mines Branch, Dept. of Energy, Mines and Resources:

Rock burst research, 1962-.

Measurements of stress and deformation were conducted in one mine experiencing rock bursts at the shallow depth of 400 ft. The analysis of this data is continuing.

1062. Currie, J.B., Univ. of Toronto:

Photoclastic and model experiments related to studies of geologic structure - a continuing project.

Experimental analysis of structural processes involved in development of features such as cleavage, faults and fold patterns; and a continuing development of dimensionally and experimentally satisfactory model materials. Recent experiments have

concerned fracture propagation in low-modulus cellulose acetate-benzl alcohol mixtures. See Photoelastic experiments related to structural geology; Proc. Geol. Assoc. Can., vol. 15, pp. 33-51, 1964.

1063. Currie, J.B., Boyd, J.R., Univ. of Toronto:

Transition from brittle to ductile behaviour in alabaster under confining pressure to 5 kilobars, 1964-67; M.Sc. thesis (Boyd).

With increasing confining pressure a transition occurs from a through-going fracture toward almost homogeneous deformation in which grain boundaries become points of rupture throughout the sample and intragranular deformation is also important. The latter type of deformation includes systematic development of kink lamellae.

1064. Dawes, P.R., Greenland Geological Survey:

Lower Palaeozoic rocks, western part of north Greenland Fold Belt, 1966.

See Geol. Surv. Can., Paper 67-1A, 1967, pp. 4-6.

1065. Edmond, K.L. (Mrs.), Univ. of Toronto:

Analysis of methods used in preparing structural cross-sections, 1961-67; M.A. thesis.

An investigation of methods useful in preparing interpretive cross-sections of subsurface geologic structures in sedimentary strata.

1066. Grant, F., Barron, K., Coates, D.F., van Heerden, W.L., Mines Branch, Dept. of Energy, Mines and Resources:

Measurements of stress in situ, 1951-.

Field measurements of stress in rock has been conducted using both a bore-hole deformation meter and a strain cell (developed by the U.S. Bureau of Mines and the South African CSIR respectively). Results have been obtained in two different mines. Comparative measurements have been obtained for the two different techniques with encouraging agreement although not with identical results. See Stress Measurements at Elliot Lake, CIM Bull. vol. 59, No. 649, 1966 (May).

1067. Gurbuz, M.B., Univ. of Manitoba:

Velocity variation in crust and upper mantle and body-wave attenuation in crust for Univ. of Manitoba crustal soundings and data from Project Early Rise in Manitoba and Ontario, 1966-69; Ph.D. thesis.

1068. Innes, M.J.S., Goodacre, A.K., Weston, A., Weber, J.R.,
Dominion Observatory:
Gravity survey, Hudson Bay, 1965-67.
See Structural implications of gravity data for Hudson Bay
and vicinity; Centennial Volume on Hudson Bay, 1967 (in press).
1069. Innes, M.J.S., Weston, A.A., Dominion Observatory:
Gravity interpretation in Appalachia, 1965-66.
Analysis of gravity data indicates that the marked gravity
high over the Green-Sutton mountain anticlinorium, and an
adjacent gravity low to the west or northwest cannot be explained
entirely by the surface geology, and deep-seated sources at the
base of the crust or in the upper mantle, are necessary. These
major gravity trends which mark the boundary between
Appalachia and the Shield are persistent and extend south to
Alabama, and northeast to Newfoundland. Statistical analyses
show that Bouguer and free air anomalies are 30 milligals
greater over the Appalachians than the adjoining Precambrian
Shield. The Appalachian region is under-compensated by 20
milligals while the Shield is over-compensated by about 10
milligals. These gravity results are inconsistent with the
crustal thicknesses determined seismically, but consistent with
the higher seismic velocities indicating a denser crust underly-
ing Appalachia. See Gravity measurements in Appalachia and
their structural implications; Proc. Roy. Soc. Can., Sym. on
Appalachia Tectonics, 1966.
1070. King, M.S., Univ. of Saskatchewan:
Mechanical properties of minerals and rocks, 1966-.
Determination of the rheologic properties of Prairie
evaporites at elevated temperatures.
1071. Krishnamurthy, P., McGill Univ.:
Experimental deformation of ores, 1966-67; M.Sc. thesis.
1072. Kwak, T.A.P., McMaster Univ.:
Metamorphic geology of an area on the Grenville Front,
1964-68; Ph.D. thesis.
Study of an area ten miles southeast of Sudbury to elucidate
the metamorphic and structural history of the Grenville Front.
1073. Lajtai, E.Z., Univ. of New Brunswick:
The influence of interlocking discontinuities on compressive
strength, 1966.

The first phase of a general research program to investigate the stability of jointed rock masses, based on structural model tests (plaster of Paris).

Shear strength of discontinuities, 1966-67.

Structural model tests utilizing a specially designed large capacity direct shear machine.

1074. Larocque, G.E., Terada, M., Darling, J.A., Aslam, M., Coates, D.F., Mines Branch, Dept. of Energy, Mines and Resources: Shock wave propagation, 1963-.

A research project is in process for studying the coupling of explosive energy with rock and the propagation of the resultant shock into the rock both for surface explosions and underground explosions. A laboratory project has been completed on measuring particle velocities and propagation velocities within the crater zone from a surface explosion. This laboratory work has been conducted using two different types of explosive and three different types of hard rock. A second set of field experiments have been conducted on ground motion acceleration close to a chemical explosion. See Attenuation of the Spherical Stress Wave Induced in Elliot Lake Quartzite by an Explosion, FMP 66/108-MRL.

1075. Norris, D.K., Geol. Surv. Can.:

Stratigraphic and structural studies in the southeastern Canadian Cordillera, 1964-.

See Geol. Surv. Can., Paper 67-1A, 1967, pp. 208-209.

1076. Parsons, R.C., Coates, D.F., Hardy, H.R. Jr., Hedley, D.G.F., Mines Branch, Dept. of Energy, Mines and Resources: Time-dependent deformation of geologic materials, 1962-.

Tests have been conducted in the laboratory on a wide spectrum of rock substances to determine typical time-dependent deformation properties. In addition, a special study is being conducted on potash. See Experimental Criteria for Classification of Rock Substances, Int. J. of Rock Mech. and Min. Sci., vol. 3, pp. 181-189, 1966.

1077. Rector, R.J., McMaster Univ.:

An experimental study of the effect of grain size, sorting and cement composition on the deformational behaviour of sandstones subjected to triaxial compression, 1966-; Ph.D. thesis.

1078. Riva, J., Université Laval:

Early Mesozoic thrust-sheets in northeastern Nevada, U.S.A., 1958-68.

See Easternmost occurrence of allochthonous Ordovician-Silurian western facies in Nevada; Geol. Soc. America, Spec. Paper 68, pp. 253-254, 1962.

1079. Schwerdtner, W.M., Ahmad, W., Univ. of Toronto:
Geometric relations between hornblende fabric and directions of quasi-homogeneous strain, 1962-70; Ph.D. thesis (Ahmad).
It is hoped to correlate the directions of preferred orientation of hornblende with the trajectories of finite strain in mesoscopic structures. After the hornblende lineations are standardized it is hoped to demonstrate their use in structural analysis of large metamorphic regions. See Preferred orientation of hornblende in a banded hornblende gneiss; Amer. Jour. Sci., 262, p. 1212, 1964.
1080. Serson, P.H., Dawson, E., Clark, J.F., Haines, G.V., Dominion Observatory:
Geomagnetism in the Hudson Bay region, 1964-66.
Presents the history of geomagnetic measurements in the Hudson Bay region, the secular variation, large scale magnetic features and their interpretation in terms of the magnetization of rocks beneath the Bay, geomagnetic disturbance and conjugate point phenomena. See Geomagnetism in the Hudson Bay region; Chapter in Hudson Bay, ed. C.S. Beals (in press).
1081. Starkey, J., Univ. of Western Ontario:
The application of X-ray techniques to petrofabric analysis, 1960-.
Newly developed X-ray petrofabric techniques and X-ray A. V. A. (Achsenverteilungsanalyse) techniques are being applied to naturally and experimentally deformed rocks. Crystallographic data are also being obtained from the deformed minerals.
Experimental deformation of quartz, 1966-.
1082. Stauffer, M.R., Univ. of Saskatchewan:
A study of textures in deformed rocks, 1963-.
See Tectonic strain in some volcanic, sedimentary and intrusive rocks near Canberra, Australia; A comparative study of deformation fabrics: New Zealand Jour. of Geol. and Geophys., in press.
Geometry of folded linear orebodies.
To derive geometric techniques for recognizing and tracing folded linear orebodies.
1083. Underhill, D.H., McMaster Univ.:
Experimental investigation of the mechanism of strain development in rock materials, 1966-; Ph.D. thesis.

The make-up of bulk strain will be determined by studying the distribution of strain between the grains and the cement in deformed specimens. Factors such as strain rate and the relative proportion of framework and cement will be varied and the effect of these variables studied.

1084. Waterhouse, J.B., Univ. of Toronto:

Tectonic history of New Zealand, 1966-67.

A structural history of New Zealand based on faunal and stratigraphic affinities with Australia and New Caledonia, especially the Permian. See A Permian fauna from northwest Nelson, New Zealand; Trans. Roy. Soc. N.Z. Geol. 3 (5), pp. 57-84, 1965.

1085. Wickens, A.J., Pec, K., Dominion Observatory:

Surface wave studies, 1962-.

A study of mean crustal and upper mantle structure for all major geological units in Canada using the seismic network of long period instruments. See Theoretical dispersion tables for Love Waves propagating in a wedge and in a single non-homogeneous layer with a linear velocity gradient; Pub. Dom. Obs., vol. 35, No. 1, 1966.

1086. Wilson, J.T., Univ. of Toronto:

Fracture zones, submarine ridges and the spreading of oceans.

The great fracture zones on the ocean floors appear to be transform faults. Assuming this to be so, their properties and the pattern of some chains of islands have been interpreted to show the possible directions of flow in the Upper Mantle. See Evidence from Ocean Islands suggesting movement in the Earth; Philosophical Trans. Roy. Soc. of London, vol. 258, No. 1038, 1965, pp. 145-167.

1087. Wynne-Edwards, H.R., Queen's Univ.:

Mechanics and geometry of folding in high grade metamorphic rocks, 1960-.

A continuing field study and theoretical investigation of folding in the catazone. See Flow folding; Am. Jour. Sci. 261, pp. 793-814, 1963.

The tectonics of the Grenville Province, 1960-.

A continuing examination of the Grenville Province and the tectonic and age relations among the different rocks within it. This is a composite study based on several smaller projects within the Grenville Province, as reported elsewhere. See The Grenville Province and its tectonic significance - Reply to Discussion; Proc. Geol. Assoc. Canada, 16, pp. 59-62.

AUTHOR INDEX

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