DOMINION OF CANADA

REPORT OF THE DEPARTMENT

OF

MINES AND RESOURCES

INCLUDING

REPORT OF SOLDIER SETTLEMENT OF CANADA

FOR THE

FISCAL YEAR ENDED MARCH 31, 1941

OTTAWA
EDMOND CLOUTIER
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1941

Price, 50 cents

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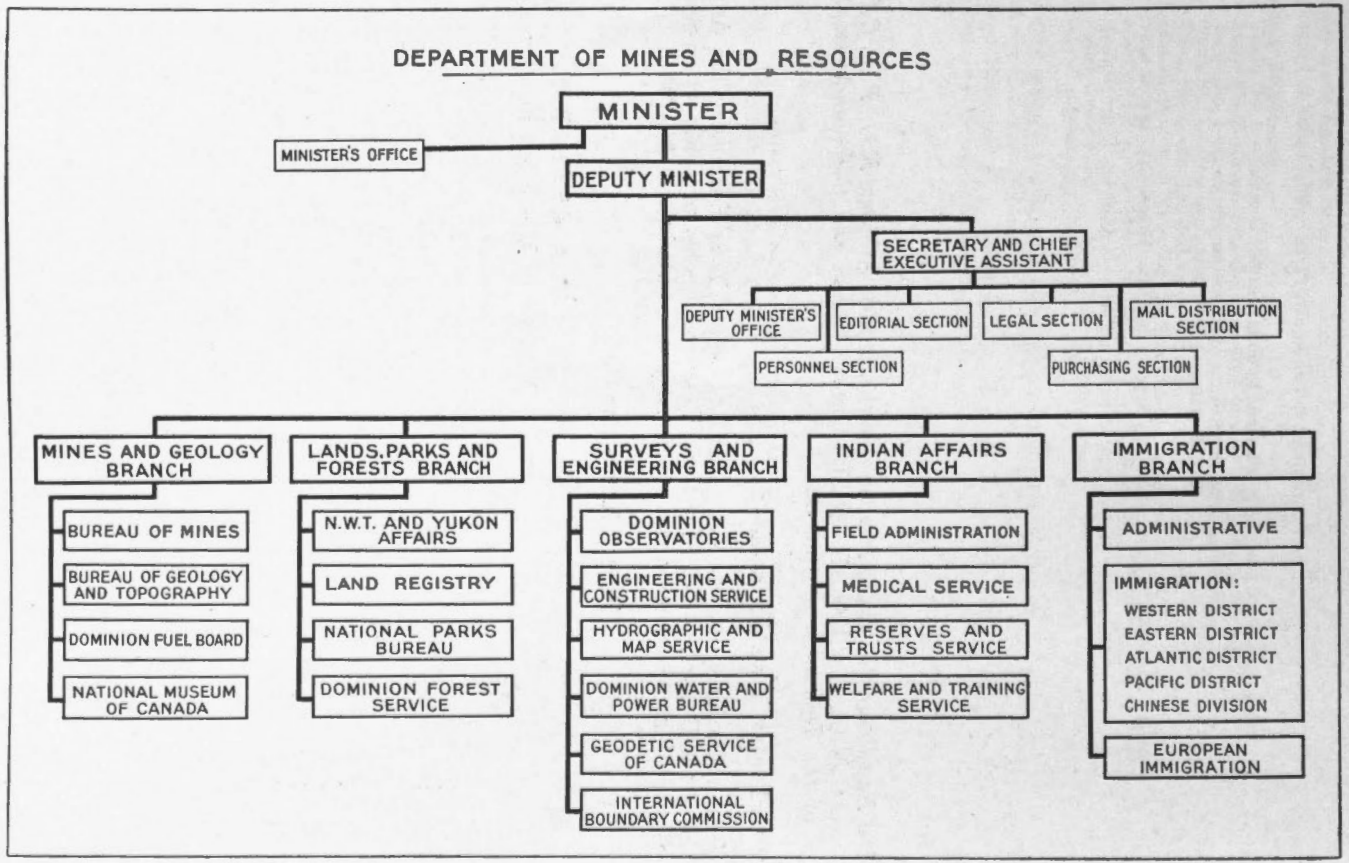
To His Excellency the Right Honourable the Earl of Athlone, K.G., P.C., G.C.B., G.C.M.G., G.C.V.O., D.S.O., Governor General and Commander-in-Chief of the Dominion of Canada.

MAY IT PLEASE YOUR EXCELLENCY:

The undersigned has the honour to lay before Your Excellency the Annual Report of the Department of Mines and Resources, including a Report on Soldier and General Land Settlement, for the fiscal year ended March 31, 1941.

Respectfully submitted,

T. A. CRERAR,
Minister of Mines and Resources.



Organization Chart, Department of Mines and Resources

REPORT

of the

DEPARTMENT OF MINES AND RESOURCES

Including

REPORT OF SOLDIER SETTLEMENT OF CANADA

FOR THE FISCAL YEAR ENDED MARCH 31, 1941

The Honourable T. A. CRERAR,
Minister of Mines and Resources,
Ottawa.

SIR,—I have the honour to submit the fifth Annual Report of the Department of Mines and Resources.

The completion of a fiscal year of activity under war conditions revealed in great measure the effect of economies instituted during the previous year. Total expenditures were reduced by $7,000,000, or about 30 per cent. The reduction was effected mostly under "special" items in the estimates, such as Tourist Roads, Mining Roads, and National Parks and Historic Sites Votes, but expenditures under the ordinary votes of the Department were also lower. There were two hundred fewer persons employed by the Department on March 31, 1941, than on the same date in 1940, and this figure does not take into account one hundred and nine employees on military leave and seventeen on loan to other Departments. Revenue was higher by close to $150,000.

As the reports of the Directors indicate, the Department of Mines and Resources continued to aid industry in solving problems arising out of the war, and in otherwise aiding the war effort. There has been close co-operation with the different Controllers of materials of the Department of Munitions and Supply, with the Coal Administrator of the Wartime Prices and Trade Board, and other officials and organizations.

Production of minerals and electricity reached new peaks. During the calendar year 1940 the output of minerals from Canadian mines totalled $530,000,000—an increase of $56,000,000 over the previous year. The output of electricity from central electric stations totalled 30,434,000,000 kilowatt hours during the fiscal year 1940-41 as compared with 28,703,000,000 kilowatt hours during the previous year.

Statistics on the production of forest products do not enable an exact comparison as between the 2 years, but war developments during the year covered by this report resulted in rising demands for Canadian pulp and paper, very large consumption of lumber in domestic defence projects and war industries, and record-breaking shipments of lumber to the United Kingdom.

SUMMARY OF REVENUE AND EXPENDITURE FOR FISCAL YEAR 1940-41

	Revenue	Expenditure Ordinary	Expenditure Special	Total Expenditure
General Administrative Branch	$ 209 29	$ 166,210 62	$	$ 166,210 62
Mines and Geology Branch—				
Branch Administration		27,780 96		
Bureau of Mines	3,653 79	423,284 64	4,434 71	
Bureau of Geology and Topography	[1]5,698 12	641,767 43		
National Museum of Canada		55,889 20		
Dominion Fuel Board	2,642 01			
Administration $ 26,591 23				
Coal Subventions 4,356,132 14				
Domestic Fuel Act 51,747 00				
		4,434,470 43		
Assistance in improving transportation facilities into mining areas.	1,391 70		[3]55,004 63	
	$ 13,385 62	$ 5,583,192 66	$ 59,439 34	
				$ 5,642,632 00
Lands, Parks and Forests Branch—				
Branch Administration		19,562 39		
Dominion Lands, Ordnance Lands, etc.	75,836 34	100,091 60		
National Parks and Historic Sites	393,546 67	1,176,219 17	198,730 55	
Forestry	29,761 48	304,684 42	30,384 74	
Northwest Territories	[2]150,095 74	293,935 19	26,501 64	
Yukon Territory	102,053 21	89,428 63		
	$ 751,293 44	$ 1,983,921 40	$ 255,616 93	
				$ 2,239,538 33
Surveys and Engineering Branch—				
Branch Administration		18,919 98		
Dominion Observatories	289 74	126,598 97		
Dominion Water and Power Bureau	120,740 57	233,249 75		
Geodetic Service	32 14	136,041 06		
International Boundary Commission	65 53	26,069 78		
Engineering and Construction Service	2,007 51	93,387 23	402,196 37	
Hydrographic Service	9,335 16	314,885 30		
Legal Surveys and Map Service	11,108 15	167,472 28		
	$ 143,578 80	$ 1,116,624 35	$ 402,196 37	
				$ 1,518,820 72
Indian Affairs Branch—				
Branch Administration		54,650 56		
Indian Agencies—Administration	1,685 58	645,690 61		
Reserves and Trusts—Administration		45,803 16	79,428 06	
Indian Education	944 18	1,908,274 08	136,471 80	
Medical Services	559 39	1,363,192 95	51,664 42	
Welfare of Indians	4,461 12	909,119 59		
Miscellaneous Statutory Items (Indian Annuities)		259,919 75		
Miscellaneous Revenue—not including revenue accruing to Indian Band funds	7,582 18			
	$ 15,232 45	$ 5,186,650 70	$ 267,564 28	
				$ 5,454,214 98

SUMMARY OF REVENUE AND EXPENDITURE FOR FISCAL YEAR 1940-41—*Conc.*

	Revenue	Expenditure Ordinary	Expenditure Special	Total Expenditure
Immigration Branch—				
Administration of the Immigration Act and the Chinese Immigration Act		157,382 00		
Field and Inspectional Service—Canada		1,013,833 85		
Field and Inspectional Service—Abroad		92,856 30		
Relief of Distressed Canadians outside Canada		8,446 67		
Special War—Miscellaneous			225,092 06	
Miscellaneous Statutory Items		4,094 67		
Miscellaneous Revenue	29,381 51			
	$ 29,381 51	$ 1,276,613 49	$ 225,092 06	
				$ 1,501,705 55
Totals for Department	$ 953,081 11	$15,313,213 22	$1,209,908 98	$16,523,122 20

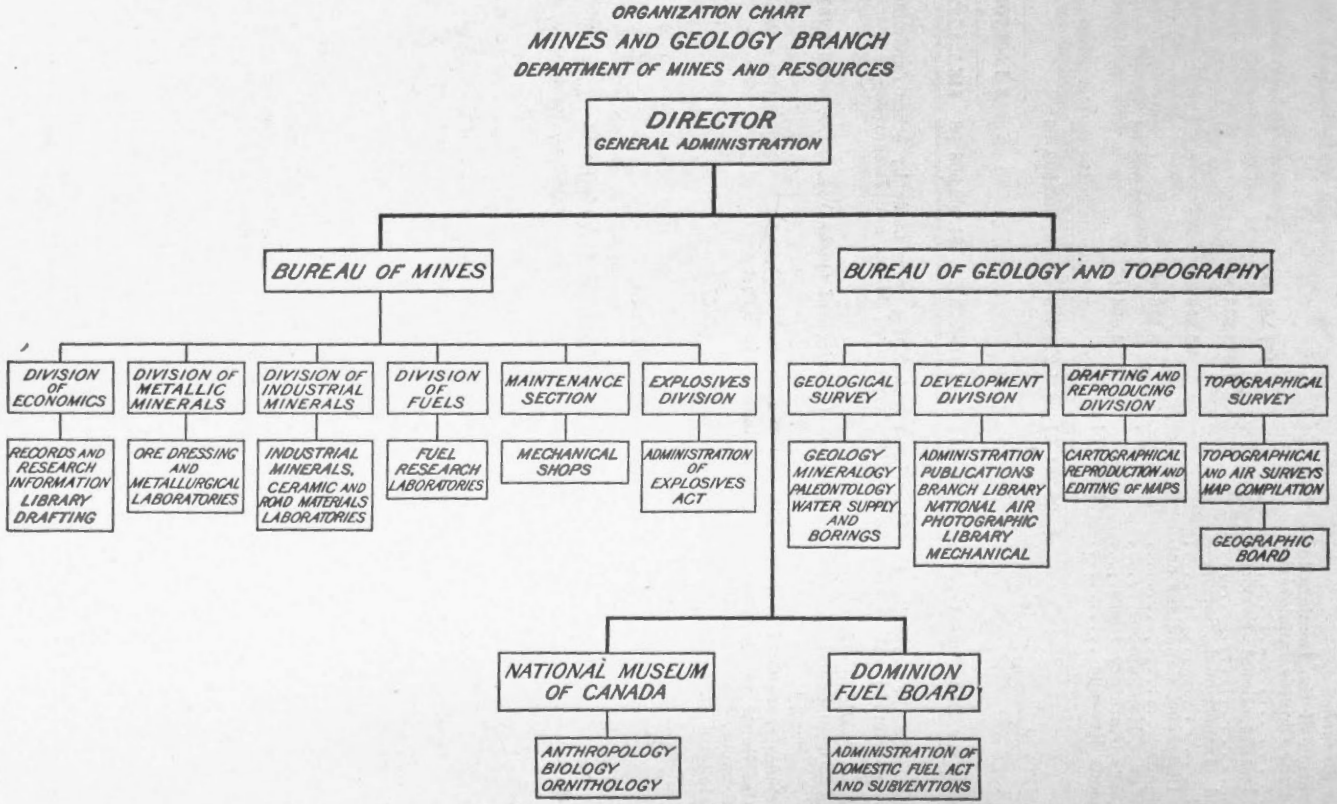
In addition to the foregoing the following expenditures were made by other departments from funds transferred out of votes of the Department of Mines and Resources—

Department of Public Works—
Vote 194S—Development of Tourist Highways (Province of Quebec) $313,401 60

NOTES—[1]Includes revenue of National Museum of Canada.
[2] Also liquor profits, fines, etc., credit balance in Trust Account, March 31, 1941, $37,510.82.
[3]Includes contributions to Provinces for work on roads.

Your obedient servant,

CHARLES CAMSELL,
Deputy Minister.



Organization Chart, Mines and Geology Branch.

MINES AND GEOLOGY BRANCH

JOHN McLEISH, DIRECTOR

The activities of the Branch during the year were linked closely with Canada's war effort. At the commencement of the fiscal year this effort was already well advanced and the demand for minerals and mineral products was far in excess of peacetime requirements. The demand continued to increase, with the result that steadily increasing use was made by the industry and by the Government war departments of the research and investigative facilities of the Branch.

Much of the work had little to do with minerals, but rather with the production of the tools of war. This included experimental studies and physical and chemical tests on materials used in the manufacture of war equipment; the supplying of information on manufacturing methods; and investigations of metallurgical problems encountered in the production of different types of equipment. In several cases these investigations were the means of avoiding delays in production and of improving the quality of the material produced.

Of special interest also were the investigations made in reference to strategic minerals. It is highly desirable owing to ocean shipping risks that these minerals be obtained in as large quantities as possible from domestic sources and, accordingly, intensive surveys were made of known deposits and of prospective producers. Largely for similar reasons, investigations were continued on certain industrial minerals such as graphite, fluorspar, potash, and brucite with a view to the developing of Canadian deposits for war use. Aside from their regular work, the fuel engineers were occupied largely in the examination and evaluation of tenders for supplies of coal to military establishments throughout the Dominion. A feature of the work of the Branch was the inspection of new explosives factories and related establishments in Canada.

Geological and topographical field work was directed largely toward the extension of the gold mining industry, which provides essential foreign credits, and toward an evaluation of the Dominion's petroleum possibilities and resources. Investigations were also made of certain war minerals that are important in the production of munitions. Twenty-six geological and eleven topographical parties were engaged in field work.

So much of the war work of the Branch is of a confidential nature that little can be said of many of its most interesting features. It has involved among other matters, close co-operation with the Metals, Oil, and Steel Controllers, and the Coal Administrator, with the war departments and organizations, and with manufacturers of war equipment; special economic office and field studies of different minerals; the loaning for varying periods of twenty-eight members of the staff to other departments of Government; and the curtailment or rearrangement in some cases of the regular work of the Branch. During the year nineteen members of the staff enlisted for active service.

From a viewpoint of production, the year was the greatest in the history of the industry, the value of output in 1940 having reached a record total of close to $530,000,000, an increase of $56,000,000 as compared with 1939. Gains were recorded by most of the fifty or more minerals produced in commercial quantities and as there were few price changes of consequence, the gains can be traced to the increasing demands of the war industries for metals and minerals.

MINING ROADS DIVISION

The report for the fiscal year ended March 31, 1940, summarized 4 years of Dominion assistance in the providing of transportation facilities into mining areas. Included therein was a table of values of works executed by provinces and territories for each year of the program, and the approximate figures given for 1939-40 have turned out to be substantially correct.

For the fiscal year 1940-41 only $58,000 was voted by Parliament. Of this, $15,319.65 was required for settlement of outstanding 1939-40 accounts and $23,000 was provided to the Lands, Parks and Forests Branch for the undertaking of projects in the Yukon and the Northwest Territories. In the Yukon, out of $15,000 allocated, expenditures were made on three road projects—Clear Creek road, Bonanza-Eldorado and Quartz Creek roads, and Dawson to Boundary and Sixtymile road—and on a fourth project consisting of improvements to airports at Whitehorse, Carcross, and McQuesten. In the Northwest Territories, the expenditures from the $8,000 allocated were on three projects, namely, Fort Smith waterfront (roads, aeroplane landing fields, and seaplane bases), Yellowknife Settlement (roads and wharf, and Yellowknife Bay), and Ptarmigan Mine road, the last being on the basis of the Dominion reimbursing 50 per cent of the mining company's expenditure.

From the remainder of the funds, under arrangements with the Province of Ontario, $7,694.68 was devoted to the completion of the 40 miles of road extending northeasterly from Goldpines to Confederation Lake, the basis being that the Dominion, Province, and Uchi Gold Mines, Limited, would each contribute one-third of the costs.

Out of a special War Appropriation of $10,000, assistance was granted to British Columbia for further work on a project to provide urgently needed access by all-weather road to a mercury mine at Pinchi Lake. An amount of $7,133.17 was expended on the basis of the Dominion, Province, and Consolidated Mining and Smelting Company of Canada each bearing one-third of the costs.

No funds for development of tourist highways were administered by the Division, but examination was made of outstanding provincial claims relating to works executed in the previous year and certain accounts, totalling $2,024.40, were transferred to the Surveys and Engineering Branch for settlement.

BUREAU OF GEOLOGY AND TOPOGRAPHY

The Bureau of Geology and Topography comprises the Geological Survey, the Topographical Survey, the Development Division, and the Draughting and Reproducing Division.

Twenty-nine geological parties were in the field in 1940, four of which were in British Columbia, five in Alberta, one in Saskatchewan, two in Manitoba, three in Ontario, six in Quebec, one in New Brunswick, three in Nova Scotia, one in Yukon, and three in the Northwest Territories. These parties were engaged chiefly in areas favourable to the occurrences of oil, gold, and strategic war minerals. Five memoirs, twenty preliminary geological papers, and fifty geological maps were published.

The Topographical Survey had eleven regular parties and two supervisory parties in the field. These parties were all employed in the foothills region of Alberta to provide base maps for the extension of geological studies of the oil potentialities. Fourteen topographical maps were published.

A total of 88,275 reports, maps, and other publications were distributed.

GEOLOGICAL SURVEY

The Geological Survey promotes the discovery and development of Canada's mineral resources by means of geological studies. The nature and extent of the underground water resources in various parts of Canada are ascertained and other investigations are made to obtain information to serve as a basis for the classification of soils for agriculture and forestry. The results of the work of the Geological Survey are presented to the public by geological maps and reports, by interview, and by correspondence. Many requests for advice regarding mineral deposits and allied subjects are also dealt with, and numerous rock and mineral specimens are identified.

Field Work

The field work in 1940 is shown in tabular form below:

Geologist	Map-area	Latitude	Longitude	Remarks
	Northwest Territories			
J. F. Henderson...	MacKay Lake.....	63°–64°	110°–112°	New project
A. W. Jolliffe.....	Yellowknife Bay...	62° 15′–62° 30′	114°–114° 30′	Completed
	Prosperous Lake...	62° 30′–62° 45′	114°–114° 30′	
C. S. Lord.....	Wray Lake.....	64°–65°	115°–117°	Completed
	Yukon			
H. S. Bostock.....	Mayo.....	63°–64°	134°–136°	Completed
	McQuesten	63°–64°	136°–138°	New project
	Mineral industry, general.....	.....	.....	Annual
	British Columbia			
J. E. Armstrong...	Manson Creek (west half).....	55°–56°	124°–125°	New project
A. H. Lang.....	Manson Creek (east half).....	55°–56°	125°–126°	New project
W. E. Cockfield...	Ashcroft (east half).	50°–51°	120°–121°	Continuation
H. M. A. Rice....	Examination of mercury, antimony, tungsten, and manganese deposits...	.....	.....	Completed
	Alberta			
B. R. MacKay....	Big Horn.....	52° 15′–52° 30′	116° 00′–116° 15′	Completed
	Brazeau.....	52° 15′–52° 30′	116° 15′–116° 30′	Completed
	Wawa.....	52° 30′–52° 45′	116°–116° 15′	New project
H. H. Beach.....	Morley.....	51°–51° 15′	114° 45′–115°	Completed
G. S. Hume.....	Pekisko.....	50° 15′–50° 30′	114°–114° 30′	Continuation
C. O. Hage.....	Beaver Mines.....	49° 15′–49° 30′	114° –114° 15′	New project
J. S. Stewart.....	Redcliff.....	50°–51°	110°–111°	Completed
	Steveville.....	50°–51°	111°–112°	Completed
	Saskatchewan			
G. M. Furnival....	Cypress Hills.....	49°–50°	109°–110°	New project

Geologist	Map-area	Latitude	Longitude	Remarks
		MANITOBA		
J. D. Bateman	Last Hope–McVeigh Lakes	.....	.....	Completed
A. F. Buckham	Athapapuskow	54° 30′–54° 45′	101° 30′–101° 45′	Completed
		ONTARIO		
T. L. Tanton	Steeprock Lake	.....	.....	Continuation
J. F. Caley	Bruce Peninsula	.....	.....	Continuation
A. E. Wilson	Ottawa–St. Lawrence	.....	.....	Continuation
		QUEBEC		
G. Shaw	Lake Evans	50°–51°	76°–77°	Completed
	Assinica	50°–51°	75°–76°	Completed
M. E. Wilson	Rouyn township	.....	.....	Continuation
E. D. Kindle	Beauchastel township	.....	.....	Completed
G. W. H. Norman	Vassan township	.....	.....	Completed
J. W. Ambrose	Brucite at Wakefield	.....	.....	Completed
	Chromite in Eastern Townships	.....	.....	New project
C. H. Stockwell	Chromite in Eastern Townships	.....	.....	New project
F. J. Alcock	Manganese on Magdalen Islands	.....	.....	Completed
L. J. Weeks	Manganese on Magdalen Islands	.....	.....	Completed
		NEW BRUNSWICK		
F. J. Alcock	Saint John to Maine	.....	.....	New project
		NOVA SCOTIA		
G. W. H. Norman	Malagash salt deposit	.....	.....	Completed
L. J. Weeks	Cobequid Bay	45° 15′–45° 30′	63° 30′–64°	Continuation
	Examination of manganese deposits	.....	.....	Completed
H. C. Cooke	Cape Breton	46° 15′–46° 30′	60° 30′–60° 45′	New project
R. T. D. Wickenden	Soil surveys in collaboration with Department of Agriculture	.....	.....	New project

OFFICE WORK

Many reports were prepared, based on the examinations of deposits of chromium, manganese, tungsten, mercury, antimony, and molybdenum.

Copy for the following geological reports and maps was completed and forwarded for publication.

Memoirs

Mining Industry of Yukon, 1939
Jacquet River and Tetagouche River Map-areas, N.B.
Noranda District, Quebec
Nelson Map-area, East Half, B.C.
Palæozoic Geology of the Brantford Area, Ont.
Mineral Industry of Northwest Territories
Gold Occurrences in Canada (Summary Account), third edition
Rare Element Minerals of Canada, second edition
The Geology of East-Central Alberta.

Papers

Zeballos Area, B.C.
Quyta Lake and Parts of Fishing Lake and Prosperous Lake Areas, Northwest Territories
Ingray Lake Area, Northwest Territories
Houston Area, B.C.
Natural Gas in the Brantford Area, Ontario
MacKay Lake, Northwest Territories
Northeast Part, Beauchastel Township, Témiscamingue County, Quebec

Preliminary Editions of Maps

MacKay Lake, N.W.T. (long. 110°-112°, lat. 63°-64°)
Ingray Lake, N.W.T. (long. 115°-117°, lat. 64°-65°)
Manson Creek, B.C. (long. 124°-125°, lat. 55°-56°)
Houston, B.C. (long. 126°-127°, lat. 54°-55°)
Jumpingpound, east half, Alta. (long. 114° 30′-114° 45′, lat. 51°-51° 15′)
Grave Flats, Alta., west half (long. 116° 45′-117°, lat. 52° 45′-53°)
Pembina Forks, Alta., east half (long. 116° 30′-116° 45′, lat. 52° 45′-53°)
Wapiabi, Alta. (long. 116° 15′-116° 30′, lat. 52° 30′-52° 45′)
George Creek, Alta. (long. 116° 30′-116°45′, lat. 52° 30′-52° 45′)
Bragg Creek, Alta. (long. 114° 30′-114° 45′, lat. 50° 45′-51°)
Bearberry, Alta. (long. 114° 45′-115°, lat. 51° 45′-52°)
Michwacho Lake, Que. (long. 75°-75° 15′, lat. 49° 45′-50°)
Great Slave Lake to Great Bear Lake, N.W.T. (long. 112°-120°, lat. 62°-66°)
Northeast part, Beauchastel Township, Que.
Morley, Alta. (long. 114° 45′-115°, lat. 51°-51° 15′)

Final Editions of Maps

Yellowknife Bay, N.W.T. (long. 114°-114° 30′, lat. 62° 15′-62° 30′)
Gordon Lake, N.W.T. (long. 113°-113° 30′, lat. 62° 45′-63°)
Gordon Lake South, N.W.T. (long. 113°-113° 30′, lat. 62° 30′-62° 45′)
Houston, B.C. (long. 126°-127°, lat. 54°-55°)
Bragg Creek, Alta. (long. 114° 30′-114° 45′, lat. 50° 45′-51°)
Jumpingpound, Alta. (long. 114° 30′-114° 45′, lat. 51°-51° 15′)
Fish Creek, Alta. (long. 114° 15′-114° 30′, lat. 50° 45′-51°)
Wildcat Hills, Alta., east half (long. 114° 30′-114° 45′, lat. 51° 15′-51° 30′)
Wapiabi, Alta. (long. 116° 15′-116° 30′, lat. 52° 30′-52° 45′)
George Creek, Alta. (long. 116° 30′-116° 45′, lat. 52° 30′-52° 45′)
Bearberry, Alta. (long 114° 45′-115°, lat. 51° 45′-52°)
Pembina Forks, Alta. (long. 116° 30′-116° 45′, lat. 52° 45′-53°)
Grave Flats, Alta. (long. 116° 45′-117°, lat. 52° 45′-53°)
Kitscoty, Alta. (long. 110°-111°, lat. 53°-54°)
Innisfree, Alta. (long. 111°-112°, lat. 53°-54°)
Stony Rapids, Sask. (long. 105°-106°, lat. 59°-60°)
Porcupine River, Sask. (long. 104°-105°, lat. 59°-60°)
Mari Lake, Sask. (long. 102°-102° 15′, lat. 55°-55° 15′)
Schist Lake, Man. (long. 101° 45′-102°, lat. 54° 30′-54° 45′)
Flinflon, Man. (long. 101° 45′-102°, lat. 54° 45′-55°)
Assiniboine, Man. (long. 98°-102°, lat. 49°-53°)
Wekusko Lake, Man. (long. 99° 45′-100°, lat. 54° 45′-55°)
Port Dover, Ont. (long. 80°-81°, lat. Lake Erie-43°)
Waterloo, Ont. (long. 80°-81°, lat. 43°-44°)
L'Orignal, Ont. and Que. (long. 74°-75°, lat. 45° 30′-45° 45′)
Maxville, Ont. (long. 74° 30′-75°, lat. 45°-45°30′)
Valleyfield, Ont. and Que. (long. 74°-74° 30′, lat. 45°-45° 30′)
Mechamego Lake, Que. (long. 75° 15′-75° 30′, lat. 49° 45′-50°)
Michwacho Lake, Que. (long. 75°-75° 15′, lat. 49° 45′-50°)

Palæontological Section

In addition to reporting on fossil collections submitted by field officers, reports were made on several collections submitted by officers of the British Columbia Department of Mines, and on a collection submitted by Imperial Oil Company. The following donations to collections of the Geological Survey were received.

Imperial Oil Company, Calgary, Alta.: Cretaceous fossils from area south of Wapiti River, Alta.

Dr. R. H. Gray, Canadian Collieries, Cumberland, B.C.: fossil plants from Nanaimo and Comox coalfields.

H. Haug, Demmett, Alta.: fossil coral from tp. 75, rge. 12, W. 6th mer., Alta.

Mineralogical Section

Several special investigations were made, the more important being a chemical and spectroscopic study of several foreign glasses used in the manufacture of glass eyes in order to arrive at some formula to be used in the manufacture of this glass in Canada; a mineralogical and chemical study of rock dust from Luscar Coals, Limited, Luscar, Alberta, to ascertain its degree of toxicity and its possibility of causing silicosis; a microscopic study of magnesitic dolomite from Kilmar, Quebec; and an extensive chemical and microscopic study of chromites from St. Cyr, Quebec.

About 6,000 specimens of minerals and rocks from various parts of Canada were examined and reported upon; in addition to which about 2,800 specimens submitted by visitors were reported on verbally.

A total of 1,489 educational collections of minerals and rocks, comprising 57,289 specimens, were furnished to prospectors and to schools and other institutions.

The following mineral specimens were presented to the Geological Survey and have been added to the mineralogical collections.

Dr. R. C. McMurchy, Powell Rouyn Gold Mines, Limited, Noranda, Que.: tetradymite.

Mr. Lorne Wilson, Ottawa: pyrrhotite from Moose Lake, east half lot 1, rge. 1, Villeneuve tp., Papineau co., Que.

Mr. Chas. A. Claflin, 60 High Street, Boston, Mass., U.S.A.: wulfenite and vanadinite from Tiger mine, Mamouth district, Arizona, U.S.A.

Major D. L. McKeand: siderite, quartz, and cryolite from Evigtut, Greenland.

Water Supply and Borings Section

The answering of inquiries on ground water supplies and the examination of samples of the material drilled in water, oil, and gas wells continued to be an important part of the work. Advice was furnished on underground water conditions in areas where war projects were being conducted.

The number of samples of rock cuttings received from wells drilled for oil, gas, or water was 62,905. The 394 samples from one well in British Columbia were received through the courtesy of the Department of Mines of British Columbia; the 35,191 samples from 77 wells in Alberta through the courtesy of the Petroleum and Natural Gas Division, Department of Lands and Mines, Alberta; the 890 samples from 22 wells in Saskatchewan through the courtesy of the Supervisor of Mines, Department of Natural Resources, Saskatchewan; the 23,101 samples from 198 wells in Ontario through the courtesy of the Natural Gas Commissioner, Department of Mines, Ontario; the 445 samples from one

well in Quebec through the courtesy of the Director of the Bureau of Mines, Department of Mines and Fisheries, Quebec; the 1,960 samples from wells in New Brunswick through the courtesy of the New Brunswick Gas and Oil Company; the 20 samples from wells in Nova Scotia through the National Parks Branch, Ottawa; and the 802 samples from four wells in the Northwest Territories and on various Indian Reserves in the Prairie Provinces through Colonel F. M. Steel, Petroleum Engineer, Indian Affairs Branch, Department of Mines and Resources.

Records of 104 wells drilled for water in Saskatchewan were received through the courtesy of Professor F. H. Edmunds, University of Saskatchewan.

British Columbia Office

The visitors who registered at the office seeking information totalled 2,740, and in addition a large number of inquiries were handled by mail and telephone. A total of 2,988 reports and 1,564 separate maps were issued in response to requests. Determinations were made of a large number of rock and mineral specimens for the public.

TOPOGRAPHICAL SURVEY

The Topographical Survey carries out original surveys for ground and air mapping and prepares maps therefrom; and compiles and prepares base maps for use in the development of the mineral and other natural resources.

Field Work of Topographical Survey, 1940

Officer in charge	Sheet name	Sheet number	Latitude and longitude	Scale of publication
J. A. Macdonald..	Limestone Mountain. Marble Mountain....	82 O/14	51° 45′– 52° 00′ 115° 00′–115° 30′	1 in. to 1 mi.
A. C. Tuttle..... R. F. Dore.....	Cripple Creek..... Fall Creek.....	83 B/4	52° 00′– 52° 15′ 115° 30′–116° 00′	1 in. to 1 mi.
F. P. Duvernet....	Tay River.....	83 B/3, W. ½	52° 00′– 52° 15′ 115° 15′–115° 30′	1 in. to 1 mi.
W. B. Dingle..... S. H. deJong.....	Alexo..... Saunders.....	83 B/5	52° 15′– 52° 30′ 115° 30′–116° 00′	1 in. to 1 mi.
R. J. Parlee.....	Dyson Creek.....	82 J/10, E. ½	50° 30′– 50° 45′ 114° 30′–114° 45′	1 in. to 1 mi.
H. A. S. West.....	Langford Creek.....	82 J/1, E. ½	50° 00′– 50° 15′ 114° 00′–114° 15′	1 in. to 1 mi.
A. M. Floyd.....	Martha Creek.....	82 G/16, E. ½	49° 45′– 50° 00′ 114° 00′–114° 15′	1 in. to 1 mi.
R. W. Clark.....	Cowley.....	82 G/9, E. ½	49° 30′– 49° 45′ 114° 00′–114° 15′	1 in. to 1 mi.
H. A. S. West..... R. W. Clark.....	Beaver Mines.....	82 G/8, E. ½	49° 15′– 49° 30′ 114° 00′–114° 15′	1 in. to 1 mi.

H. N. Spence—triangulation control for Sheets 83 B/5; 83 B/4; 83 B/3, W.½; 82 O/14.
W. H. Miller and J. W. Spence supervised the above work in the field.

At the end of the field season, four members of the staff were engaged for a month and a half on mapping for the Department of National Defence.

Office Work

The following manuscript maps were plotted from ground or air surveys and cleared to the Map Compilation Section:

Name	Number	Latitude and longitude	Ground or air	Publication scale
		Yukon		
McQuesten	115 P	63° 00′– 64° 00′ 136° 00′–138° 00′	Ground	1 in. to 4 mi.
		Northwest Territories		
Aylmer Lake	76 C	64° 00′– 65° 00′ 108° 00′–110° 00′	Air	1 in. to 4 mi.
Redrock Lake	86 G, W. ½	65° 00′– 66° 00′ 115° 00′–116° 00′	Air	1 in. to 4 mi.
Hill Island	75 C	60° 00′– 61° 00′ 108° 00′–110° 00′	Air	1 in. to 4 mi.
Abitau Lake	75 B	60° 00′– 61° 00′ 106° 00′–108° 00′	Air	1 in. to 4 mi.
		Alberta		
Fall Creek	83 B/4, E. ½	52° 00′– 52° 15′ 115° 30′–115° 45′	Ground	1 in. to 1 mi.
Saunders	83 B/5, E. ½	52° 15′– 52° 30′ 115° 30′–115° 45′	Ground	1 in. to 1 mi.
Tay River	83 B/3, W. ½	52° 00′– 52° 15′ 115° 15′–115° 30′	Ground	1 in. to 1 mi.
Turner Valley	82 J/9, W. ½	50° 30′– 50° 45′ 114° 15′–114° 30′	Ground	1 in. to 1 mi.
Black Diamond	82 J/9, E. ½	50° 30′– 50° 45′ 114° 00′–114° 15′	Ground	1 in. to 1 mi.
Wawa	83 C/9, E. ½	52° 30′– 52° 45′ 116° 00′–116° 15′	Ground	1 in. to 1 mi.
		Saskatchewan		
Lowe Lake	74 O/7	59° 15′– 59° 30′ 106° 30′–107° 00′	Air	1 in. to 1 mi.
Wiley Lake	74 O/8	59° 15′– 59° 30′ 106° 00′–106° 30′	Air	1 in. to 1 mi.
Stony Rapids	74 P/5, W. ½	59° 15′– 59° 30′ 105° 45′–106° 00′	Air	1 in. to 1 mi.
		Manitoba		
Athapapuskow	63 K/12, E. ½	54° 30′– 54° 45′ 101° 30′–101° 45′	Air	1 in. to 1 mi.

Name	Number	Latitude and longitude	Ground or air	Publication scale
		QUEBEC		
Schyan Lake	31 K/6, E. ½	46° 15′–46° 30′ 77° 00′–77° 15′	Air	1 in. to 1 mi.
St. Patrick Lake	31 K/6, W. ½	46° 15′–46° 30′ 77° 15′–77° 30′	Air	1 in. to 1 mi.
Rowanton	31 K/5, E. ½	46° 15′–46° 30′ 77° 30′–77° 45′	Air	1 in. to 1 mi.
Lac Larouche	31 N/2, W. ½	47° 00′–47° 15′ 76° 45′–77° 00′	Air	1 in. to 1 mi.
Nishkotea Lake	31 N/3, E. ½	47° 00′–47° 15′ 77° 00′–77° 15′	Air	1 in. to 1 mi.
Ward Lake	31 N/3, W. ½	47° 00′–47° 15′ 77° 15′–77° 30′	Air	1 in. to 1 mi.
Labrador Lake	31 N/4, E. ½	47° 00′–47° 15′ 77° 30′–77° 45′	Air	1 in. to 1 mi.
Kachikaki Lake	31 N/8, E. ½	47° 15′–47° 30′ 76° 00′–76° 15′	Air	1 in. to 1 mi.
Lake Travers	31 N/8, W. ½	47° 15′–47° 30′ 76° 15′–76° 30′	Air	1 in. to 1 mi.
Cabonga	31 N/7, E. ½	47° 15′–47° 30′ 76° 30′–76° 45′	Air	1 in. to 1 mi.
Birch Lake	31 N/6, E. ½	47° 15′–47° 30′ 77° 00′–77° 15′	Air	1 in. to 1 mi.
Lac la Loche	31 N/6, W. ½	47° 15′–47° 30′ 77° 15′–77° 30′	Air	1 in. to 1 mi.
Perch Lake	31 N/5, E. ½	47° 15′–47° 30′ 77° 30′–77° 45′	Air	1 in. to 1 mi.
Opikwan Lake	31 N/11, E. ½	47° 30′–47° 45′ 77° 00′–77° 15′	Air	1 in. to 1 mi.
Denain Lake	31 N/14, E. ½	47° 45′–48° 00′ 77° 00′–77° 15′	Air	1 in. to 1 mi.
Marrias Lake	31 N/14, W. ½	47° 45′–48° 00′ 77° 15′–77° 30′	Air	1 in. to 1 mi.
Steamboat Rock Lake.	31 P/3, E. ½	47° 00′–47° 15′ 73° 00′–73° 15′	Air	1 in. to 1 mi.
Lac Livernois	31 P/3, W. ½	47° 00′–47° 15′ 73° 15′–73° 30′	Air	1 in. to 1 mi.
Lac Brehault	31 P/4, E. ½	47° 00′–47° 15′ 73° 30′–73° 45′	Air	1 in. to 1 mi.
Clear Lake	31 P/4, W. ½	47° 00′–47° 15′ 73° 45′–74° 00′	Air	1 in. to 1 mi.
Harper Lake	31 P/6, E. ½	47° 15′–47° 30′ 73° 00′–73° 15′	Air	1 in. to 1 mi.

Name	Number	Latitude and longitude	Ground or air	Publication scale
		QUEBEC—*Continued*		
Lac Boucher	31 P/6, W. ½	47° 15′–47° 30′ 73° 15′–73° 30′	Air	1 in. to 1 mi.
Wickenden Lake	31 P/5, E. ½	47° 15′–47° 30′ 73° 30′–73° 45′	Air	1 in. to 1 mi.
Mondonak Lake	31 P/5, W. ½	47° 15′–47° 30′ 73° 45′–74° 00′	Air	1 in. to 1 mi.
St. Vianney	22 B/11, W. ½	48° 30′–48° 45′ 67° 15′–67° 30′	Ground and air	1 in. to 1 mi.
Cuoq	22 B/11, E. ½	48° 30′–48° 45′ 67° 00′–67° 15′	Ground and air	1 in. to 1 mi.

A revision was made of Yellowknife District map, scale 1 inch to 8 miles, in the Northwest Territories, and covering the area between latitudes 62°00′ to 66°00′ and longitudes 112°00′ to 120°00′.

For use as a base map for forestry information, a compilation on a scale of 800 feet to 1 inch was made from air photography for the Dominion Forest Service of parts of map-sheets numbered 31 F/14, F/13, K/3, and K/4, comprising Petawawa Forest Experiment Station.

A relief model of the Lake Minnewanka area was prepared for administrative use in the Lands, Parks and Forests Branch. Special maps were also prepared to meet the needs of other Government services.

Map projects actively in hand at the end of the fiscal year, 39, and 12 projects, on which the planimetric work has been completed, were set aside for contouring in the field.

The Map Compilation Section forwarded to the Draughting and Reproducing Division the following topographical and geographical base maps:

Name	Sheet number	Latitude and longitude	Publication scale
	YUKON		
Ogilvie	115 O	63° 00′– 64° 00′ 138° 00′–140° 00′	1 in. to 4 mi. (revision)
	NORTHWEST TERRITORIES		
Fort Resolution	85 H	61° 00′– 62° 00′ 112° 00′–114° 00′	1 in. to 4 mi.
Snare River	85 O, W. ½ 85 N, E. ½	63° 00′– 64° 00′ 115° 00′–117° 00′	1 in. to 4 mi.
Indin Lake	86 B	64° 00′– 65° 00′ 114° 00′–116° 00′	1 in. to 4 mi.
Hardisty Lake	86 C	64° 00′– 65° 00′ 116° 00′–118° 00′	1 in. to 4 mi.
Walmsley	75 N	63° 00′– 64° 00′ 108° 00′–110° 00′	1 in. to 4 mi.

Name	Sheet number	Latitude and longitude	Publication scale
BRITISH COLUMBIA			
Fort Fraser (W. ½)	93 K, W. ½	54° 00′– 55° 00′ 125° 00′–126° 00′	1 in. to 4 mi. (revision)
Tatlatui	94 D, W. ½	56° 00′– 57° 00′ 127° 00′–128° 00′	1 in. to 4 mi.
ALBERTA			
Grave Flats	83 C/15, W. ½	52° 45′– 53° 00′ 116° 45′–117° 00′	1 in. to 1 mi.
Moose Mountain	82 J/15, W. ½	50° 45′– 51° 00′ 114° 45′–115° 00′	1 in. to 1 mi.
Jumpingpound	82 O/2, E. ½	51° 00′– 51° 15′ 114° 30′–114° 45′	1 in. to 1 mi.
Wildcat Hills (E. ½)	82 O/7, E. ½	51° 15′– 51° 30′ 114° 30′–114° 45′	1 in. to 1 mi.
George Creek	83 C/10, E. ½	52° 30′– 52° 45′ 116° 30′–116° 45′	1 in. to 1 mi.
Wawa	83 C/9, E. ½	52° 30′– 52° 45′ 116° 00′–116° 15′	1 in. to 1 mi.
Innisfree	73 E, W. ½	53° 00′– 54° 00′ 111° 00′–112° 00′	1 in. to 4 mi.
Kitscoty	73 E, E. ½	53° 00′– 54° 00′ 110° 00′–111° 00′	1 in. to 4 mi.
SASKATCHEWAN			
Nevins Lake	74 O/12, W. ½ and part of 74 O/5, W. ½.	59° 23′– 59° 45′ 107° 45′–108° 00′	1 in. to 1 mi.
Mari Lake	63 M/1, E. ½	55° 00′– 55° 15′ 102° 00′–102° 15′	1 in. to 1 mi.
Porcupine River	74 P, E. ½	59° 00′– 60° 00′ 104° 00′–105° 00′	1 in. to 4 mi.
MANITOBA			
Wekusko	63 J/13, W. ½ and part of 63 J/12, W. ½.	54° 38′– 55° 00′ 99° 45′–100° 00′	1 in. to 1 mi.
Athapapuskow Lake	63 K/12, E. ½	54° 30′– 54° 45′ 101° 30′–101° 45′	1 in. to 1 mi.

Name	Sheet number	Latitude and longitude	Publication Scale
ONTARIO			
Port Dover	40 I/NE	42° 30′–43° 00′ 80° 00′–81° 00′	1 in. to 4 mi.
Waterloo	40 P, E. ½	43° 00′–44° 00′ 80° 00′–81° 00′	1 in. to 4 mi.
Windigo Lake	53 B, W. ½	52° 00′–53° 00′ 91° 00′–92° 00′	1 in. to 4 mi.
North Caribou Lake	53 B, E. ½	52° 00′–53° 00′ 90° 00′–91° 00′	1 in. to 4 mi.
ONTARIO AND QUEBEC			
Valleyfield	31 G/SE, E. ½	45° 00′–45° 30′ 74° 00′–74° 30′	1 in. to 2 mi.
Maxville	31 G/SE, W. ½	45° 00′–45° 30′ 74° 30′–75° 00′	1 in. to 2 mi.
L'Orignal	Part of 31 G/NE.	45° 30′–45° 45′ 74° 00′–75° 00′	1 in. to 2 mi.
QUEBEC			
Lac Routhier	Parts of 32 D/2 and 32 D/7.	48° 14′–48° 17′ 78° 52′–79° 00′	1 in. to 2,000 ft.
Lac Dufault	Part of 32 D/7	48° 17′–48° 21′ 78° 57′–79° 00′	1 in. to 1,600 ft.
Brock River	32 J, E. ½	50° 00′–51° 00′ 74° 00′–75° 00′	1 in. to 4 mi.
Assinica Lake	32 J, W. ½	50° 00′–51° 00′ 75° 00′–76° 00′	1 in. to 4 mi.
Quebec, east sheet,		lat. 47° 00′–50° 30′; long. 61° 00′–67° 00′	1 in. to 16 mi.
Quebec, centre sheet,		lat. 45° 00′–50° 30′; long. 67° 00′–73° 00′	1 in. to 16 mi.
Quebec, west sheet,		lat. 45° 00′–50° 30′; long. 73° 00′–79° 30′	1 in. to 16 mi.
Cullin Lake	31 K/5, W. ½	46° 15′–46° 30′ 77° 45′–78° 00′	1 in. to 1 mi.
Schyan Lake	31 K/6, E. ½	46° 15′–46° 30′ 77° 00′–77° 15′	1 in. to 1 mi.
St. Michel	31 I/NW, W. ½	46° 30′–47° 00′ 73° 30′–74° 00′	1 in. to 2 mi.
NEW BRUNSWICK			
Tetagouche River	21 P/NW, W. ½	47° 30′–48° 00′ 65° 30′–66° 00′	1 in. to 2 mi.
Jacquet River	21 O/NE, E. ½ and part of 22 B/SE., E. ½.	47° 30′–48° 05′ 66° 00′–66° 30′	1 in. to 2 mi.

The following preliminary topographical and geological maps have been prepared:

Topographical	*Geological*
South Nahanni River, N.W.T.	Great Slave Lake-Great Bear Lake, N.W.T.
Carp Lakes, N.W.T.	Ingray Lake, N.W.T.
Fort Resolution, N.W.T.	MacKay Lake, N.W.T.
Mackenzie River Delta, N.W.T.	Taku River, B.C.
Tatlatui, B.C.	Manson Creek, B.C.
Wapiabi Creek, Alta.	Houston, B.C.
Nevins Lake, Map "A", Sask.	Cross-sections of Eastern Foothills, etc., Alta.
Flin Flon, Man. and Sask.	Jumpingpound, Alta.
Stokely Creek, Ont.	Bragg Creek, Alta.
Point Alexander, Ont. and Que.	Wapiabi Creek, Alta.
Chalk River, Ont. and Que.	George Creek, Alta.
Stonecliffe, Ont. and Que.	Grave Flats, Alta.
McGillivray Lake, Que.	Pembina Forks, Alta.
Assinica Lake, Que.	Bearberry, west half, Alta.
Cuvillier, Que.	Stony Rapids, Sask.
Mishagomish Lake, Que.	Porcupine River, Sask.
Soskumika Lake, Que.	Michwacho, Que.
	Assinica Lake, Que.
	Mishagomish Lake, Que.

At the end of the year, eighty-one map manuscripts were in various stages of progress in the Map Compilation Section. Of these, nine geological base maps were completed and are ready for transmission when the geological manuscripts are received. Four preliminary geological maps and forty preliminary topographical maps were also in hand.

Sixty-one map projections were made and base maps for field and office use of the Geological Survey were supplied as required. Three tracings of oil wells in western Ontario and an index of geological maps in Quebec were also prepared.

Physical Geography

Compilation of the geographic base for the Glacial Map of North America, scale 1 inch to 20 miles, and the assembling of the glacial data were continued. Most of th area north of latitude 60° 00′ has been compiled.

Usual inquiries pertaining to subjects of geographical interest were dealt with, and the review of much literature dealing with physical geography was completed.

Geographic Board of Canada

The Secretary reports as follows:

The Geographic Board of Canada was created by Order in Council of December 18, 1897, which directs that all questions concerning geographical names in the Dominion that arise in the departments of the public service shall be referred to the Board and that all departments shall accept and use in their publications the names and orthography adopted by the Board. By Order in Council of December 14, 1899, each province was invited to appoint a representative on the Board.

All proposed names are submitted to the provincial representatives concerned for report and advice before they are dealt with by the Board.

Lt.-Col. J. E. Lyon has been succeeded by M. F. Phelan as the representative for the Department of National Defence; D. C. Harvey, Provincial Archivist, has succeeded the late Harry Piers as the representative for Nova Scotia.

The Dominion Government personnel of the Board is as follows: A. Dickison (Chairman), F. H. Peters, F. C. C. Lynch, G. A. Young, N. J. Ogilvie, and D. L. McKeand, all of the Department of Mines and Resources; E. E. Gagnon, Department of Transport; M. F. Phelan, Department of National Defence; and J. H. Corry, Secretary.

The provincial representatives are: Alberta, H. P. Brownlee; British Columbia, F. C. Green (pro tem. vice G. G. Aitken—on military leave); Manitoba, H. E. Beresford; New Brunswick, A. S. McFarlane; Nova Scotia, D. C. Harvey; Ontario, C. H. Fullerton; Prince Edward Island, Hon. Bradford W. LePage, Lieutenant-Governor; and Saskatchewan, John Ross Hill.

Several controversial questions relating to the orthography of Canadian geographical place-names were ruled upon by the Board, and thousands of place-names were passed as satisfactory for sixty-nine maps; many inquiries were also received and answered regarding the location of geographical features in Canada, the authentic names for the same, and the history of the names.

DEVELOPMENT DIVISION

The Development Division is organized to carry out the general executive and administrative work of the Bureau; to make investigations designed to assist mineral development; to maintain the centralized aerial photographic services; and to administer the general services required by the Bureau and the National Museum.

National Air Photographic Library

The National Air Photographic Library is the central reference library for aerial photography in Canada. It comprises approximately 825,700 prints of aerial negatives, covering an area of about 865,500 square miles. This large collection is made up mostly from aerial photography carried out by the Royal Canadian Air Force, but it includes also prints received from many other sources. Of the 11,448 new photographs added during the year, for instance, 2,390 were supplied by the United States Department of Agriculture. These latter cover a strip along the International Boundary in Manitoba, Saskatchewan, and Alberta. Of particular interest among the new accessions were 732 photographs, covering about 10,000 square miles in Newfoundland, taken by means of the seven-lens camera.

Aerial photographs are used widely in the study and development of Canada's natural resources, and the National Air Photographic Library is organized to give all needed assistance in their use. Inquiries by mail are given careful consideration and index maps of areas photographed and other related information are prepared as required. In the Library, facilities for stereoscopic study of the photographs are provided and expert assistance in their interpretation is given. Copies of any of the photographs can be obtained at a nominal charge. During the year, 31,931 prints were supplied in this way.

Extensive use is made of the Library by Federal, Provincial, and commercial organizations. Many of their representatives called to examine photographs of areas in which they were interested and to obtain technical assistance in their problems. Such assistance was given in locating from the photographs a winter road from Island Falls on Churchill River to a proposed storage dam on Reindeer River. Similarly, assistance was given in the selection of suitable sites for manufacturing plants designed for war purposes and in the selection of training areas for the Army and sites of flying fields for the Air Force.

During the past 4 years, employees of the Department of Agriculture have been assisted and supervised in the preparation of municipality folders of aerial photographs for the Water Development and Economic Branches operating under the Prairie Farm Rehabilitation Act. These employees completed their work in December and during the year they indexed, gridded, and assembled into folders approximately 10,000 aerial photographs. These folders covered 77 municipalities, 43 in Saskatchewan, and 34 in Alberta.

Photographic Section

Following is a summary of the work:

Contact prints	4 x 5 to 36 x 48	8,718
Bromide enlargements	4 x 5 to 32 x 40	2,135
Exposures developed	1 x 1½ to 5 x 7	3,040
Dry plate negatives	4 x 5 to 20 x 24	538
Wet plate negatives	8 x 10 to 24 x 30	184
Lantern slides	3¼ x 4	406
Photos and maps mounted		3,554
Total		18,575

Library

The number of accessions to the Library of the Bureau of Geology and Topography and National Museum was somewhat less than last year, owing to war conditions. Many foreign subscriptions and exchanges could no longer be obtained and less funds were available for the purchase of books.

Accessions during the year include:

Books acquired by purchase	84
Books (complete unbound volumes by purchase)	106
Books (by transfer and gift)	677
Pamphlets and reprints (by gift)	204
Canadian Government documents—individual issues (by exchange and gift)	720
British and Foreign Government documents—individual issues (by exchange and gift)	1,242
Canadian periodicals, individual issues	409
British and Foreign periodicals, individual issues	1,708
Scientific societies' bulletins, proceedings, and transactions, individual issues (by exchange and gift)	1,375
Total	6,525

The map collection was increased by 417 new maps and charts and 2,253 photographs were classified and filed. Recorded loans amounted to 8,031. Inter-library loans numbered 613, and 205 books were borrowed from other libraries.

Two hundred and forty-eight maps were borrowed besides those consulted in the Library, and 527 lantern slides were loaned to members of the staff and to educational institutions.

Two hundred and ten volumes were bound. Cards added to the catalogue numbered 4,318, of which 87 were bibliographical and 51 biographical entries. The analysing of important monographs and other significant material added 951 new titles. The map catalogue received 225 new cards. Over sixty new serials were obtained, many from central South American countries.

Among other routine duties performed by the staff was the checking of 429 shelves of textbooks and making corrections, as called for, in the catalogue and shelf list. They also completed the checking of the serial holdings of the Library for inclusion in the second edition of the Union List of Serials in the Libraries of the United States and Canada, to be published by the Council of Learned Societies of America.

The reference and informational service of the Library has been in constant request. Inquiries come from staff members and associates, investigators in other Government departments, and from institutions and individuals throughout the country.

A special effort was made to complete files of valuable scientific series. In response to a request the Service Geologique de France supplied a rare volume of 176 plates, completing volume 4 of the Memoire for 1878-9. Puerto Rico University sent Monographs 2, 3, and 4. Philippine Journal of Science

brought the file up to date by presenting volumes 66 to 71, and the Roumanian Academy of Science sent a considerable number of Bulletins that were not in the set. Many special volumes came from the United States Geological Survey, the librarian presenting a number of needed volumes of the Geological Society of China. Through the courtesy of the Library of Congress and the Librarian of Laval University in Quebec, second sets of United States and Canadian official publications were made almost complete.

Mechanical Section

This section provides the Bureau and the National Museum with blue-printing, photostat printing, carpentry, electrical, and lapidary services and handles the maintenance and issue of scientific and surveying instruments. The blue-printing of maps for preliminary papers, and of plans and drawings for war purposes, were important features of the year's activities, the total output of 87,023 prints requiring 499,037 square feet of paper. Photostat printing totalled 13,680 sheets. Approximately 57 per cent of the total output was for war work.

In the instrument section, maintenance of field and office instruments was carried on and several special instruments were manufactured for the Topographical Survey Division.

Stores and Supplies Section

Field equipment and supplies to the value of approximately $100,000 is stored, checked, repaired, and distributed through this section. Equipment and supplies were assembled and assigned to forty-two geological and topographical field parties operating throughout Canada from the Maritimes to the Yukon. This section also handles all stationery and other office supplies required by the Bureau and the National Museum.

Geological Information and Distribution

A total of 86,363 publications of the Bureau of Geology and Topography and of the National Museum, exclusive of French editions, were distributed. Of these 23,007 were sent to addresses on the regular mailing lists, and 63,356 were distributed in compliance with written and personal requests for named publications, or requests for general or specific information. The French publications, which are distributed by the Editorial Division, numbered 1,912.

DRAUGHTING AND REPRODUCING DIVISION

Maps Published April 1, 1940, to March 31, 1941

Publication Number	Title	Remarks
	Northwest Territories	
558A	Canadian Eastern Arctic; scale, 1 inch to 100 miles	Geography. For Museum Bulletin 92, by N. Polunin.
581A	Beaulieu River, District of Mackenzie; scale, 1 inch to 4 miles	Geology. For separate distribution.
594A	Hanbury, District of Mackenzie; scale, 1 inch to 4 miles	Topography. For separate distribution.
598A	Muir Lake, District of Mackenzie; scale, 1 inch to 1 mile	Topography. For separate distribution.
600A	Marian River, District of Mackenzie; scale, 1 inch to 4 miles	Topography. For separate distribution.

Maps Published April 1, 1940, to March 31, 1941—Continued

Publication Number	Title	Remarks
	BRITISH COLUMBIA	
341A	Keremeos, Similkameen District; scale, 1 inch to 1 mile	Geology. For separate distribution.
538A	Kettle River (west half), Similkameen and Osoyoos Districts; scale, 1 inch to 4 miles	Geology. For separate distribution.
539A	Kettle River (west half), Similkameen and Osoyoos Districts; scale, 1 inch to 4 miles	Mineral localities. For separate distribution.
561A	Little River, Cariboo District; scale, 1 inch to 1 mile	Geology. For separate distribution.
562A	Keithley Creek, Cariboo District; scale, 1 inch to 1 mile	Geology. For separate distribution.
563A	Cariboo Mountain, Cariboo District; scale, 1 inch to 1 mile	Geology. For separate distribution.
564A	Chiaz Creek, Cariboo District; scale, 1 inch to 1 mile	Geology. For separate distribution.
568A	Hedley, Similkameen and Kamloops Districts; scale, 1 inch to 1 mile	Geology. For separate distribution.
569A	Wolfe Creek, Similkameen and Kamloops Districts; scale, 1 inch to 1 mile	Geology. For separate distribution.
603A	Nelson (east half), Kootenay District; scale, 1 inch to 4 miles	Geology. For Memoir 228, by H. M. A. Rice, and separate distribution.
	ALBERTA	
565A	Taber; scale, 1 inch to 4 miles	Geology. For Memoir 221, by L. S. Russell and R. W. Landes and separate distribution.
566A	Foremost; scale, 1 inch to 4 miles	Geology. For Memoir 221, by L. S. Russell and R. W. Landes, and separate distribution.
567A	Dunmore; scale, 1 inch to 4 miles	Geology. For Memoir 221, by L. S. Russell and R. W. Landes, and separate distribution.
606A	Midnapore; scale, 1 inch to 1 mile	Geology. For separate distribution.
609A	Wapiabi Creek; scale, 1 inch to 1 mile	Topography. For separate distribution.
610A	Pembina Forks; scale, 1 inch to 1 mile	Topography. For separate distribution.
611A	Grave Flats; scale, 1 inch to 1 mile	Topography. For separate distribution.
	SASKATCHEWAN	
582A	Goldfields; scale, 1 inch to 1 mile	Topography. For separate distribution.
	SASKATCHEWAN AND MANITOBA	
601A	Schist Lake; scale, 1 inch to 1 mile	Topography. For separate distribution.

Maps Published April 1, 1940, to March 31, 1941—Continued

Publication Number	Title	Remarks
	ONTARIO	
557A	Watcomb, Kenora and Rainy River districts; scale, 1 inch to 4 miles	Geology. For separate distribution.
559A	Madoc; Hastings, Lennox and Addington counties; scale, 1 inch to 1 mile	Geology. For separate distribution.
560A	Marmora, Hastings, Peterborough, and Northumberland counties; scale, 1 inch to 1 mile	Geology. For separate distribution.
583A	Stokely Creek, Algoma district; scale, 1 inch to 1 mile	Topography. For separate distribution.
584A	Toronto-Hamilton; scale, 1 inch to 4 miles	Geology. For Memoir 224, by J. F. Caley, and separate distribution.
585A	Part of Niagara Peninsula; scale, 1 inch to 2 miles	Geology. For Memoir 224, by J. F. Caley, and separate distribution.
586A	Verner, Nipissing, Sudbury, and Parry Sound districts; scale, 1 inch to 2 miles	Topography. For separate distribution.
589A	Capreol; Sudbury district; scale, 1 inch to 2 miles	Topography. For separate distribution.
636A	Norfolk county and parts of adjacent counties; scale, 1 inch to 2 miles	Geology. For Memoir 226, by J. F. Caley, and separate distribution.
	ONTARIO AND QUEBEC	
587A	Casselman; Russell, Dundas, Stormont, Prescott, Carleton, and Papineau counties; scale, 1 inch to 2 miles	Geology. For separate distribution.
588A	Nepean; Carleton, Lanark, Grenville, Dundas, Gatineau, and Papineau counties; scale, 1 inch to 2 miles	Geology. For separate distribution.
	QUEBEC	
547A	Joliette; Maskinongé, Berthier, Joliette, and Richelieu counties; scale, 1 inch to 2 miles	Topography. For separate distribution.
553A	Rochebaucourt, Abitibi county; scale, 1 inch to 1 mile	Geology. For separate distribution.
554A	Gale River, Abitibi territory and Abitibi county; scale, 1 inch to 2 miles	Geology. For separate distribution.
555A	Lewis Lake, Abitibi territory; scale, 1 inch to 1 mile	Geology. For memoir, also French edition, and separate distribution.
556A	Opawica Lake, Abitibi territory; scale, 1 inch to 1 mile	Geology. For memoir, also French edition, and separate distribution.
570A	Puskitamika Lake, Abitibi territory; scale, 1 inch to 4 miles	Geology. For separate distribution.

Maps Published April 1, 1940, to March 31, 1941—Continued

Publication Number	Title	Remarks
	QUEBEC—*Continued*	
571A	Mattagami Lake, Abitibi territory; scale, 1 inch to 4 miles	Geology. For separate distribution.
572A	Sheet 1, Malartic (in four sheets), Malartic, Fournière, Cadillac, and Surimau townships, Abitibi county; scale, 1 inch to 1,500 feet	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, also French edition, and separate distribution.
573A	Sheet 2, Malartic (in four sheets), Malartic and Fournière townships, Abitibi county; scale, 1 inch to 1,500 feet	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, also French edition, and separate distribution.
574A	Sheet 3, Malartic (in four sheets), Malartic township, Abitibi county; scale, 1 inch to 1,500 feet	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, also French edition, and separate distribution.
575A	Sheet 4, Malartic (in four sheets), Malartic and Cadillac townships, Abitibi county; scale, 1 inch to 1,500 feet	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, also French edition, and separate distribution.
—	Figure 1, Generalized map of the Cadillac and Malartic areas, Abitibi county; scale, 1 inch to 1½ miles	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, and also French edition.
—	Figure 2, Vicinity of Canadian Malartic mine, Fournière township, Abitibi county; scale, 1 inch to 300 feet	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, and also French edition.
—	Figure 3, Lots 16 to 20, ranges 4 and 5, Malartic township, Abitibi county; scale, 1 inch to 200 feet	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, and also French edition.
—	Figure 4, Pan-Canadian area, Cadillac township, Abitibi county; scale, 1 inch to 300 feet	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, and also French edition.
—	Figure 5, Little Héva River structure, Malartic township, Abitibi county; scale, 1 inch to 1,500 feet	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, and also French edition.
—	Figure 6, Distribution of metamorphic types, Malartic area, Abitibi county; scale, 1 inch to 1 mile	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, and also French edition.

Maps Published April 1, 1940, to March 31, 1941—Continued

Publication Number	Title	Remarks
	QUEBEC—*Concluded*	
—	Figure 7, Cartier Malartic area, Malartic and Fournière townships, Abitibi county; scale, 1 inch to 200 feet	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, and also French edition.
—	Figure 8, Isometric diagram, Sladen Malartic mine, Fournière township, Abitibi county; scale, 1 inch to 75 feet	Geology. For Memoir 222, by H. C. Gunning and J. W. Ambrose, and also French edition.
597A	Mishagomish Lake, Abitibi and Mistassini territories; scale, 1 inch to 4 miles	Topography. For separate distribution.
612A	Sheet 1, Bousquet-Joannès (in four sheets), Bousquet township, Abitibi county; scale, 1 inch to 1,500 feet	Geology. For Memoir 231, by H. C. Gunning, also French edition, and separate distribution.
613A	Sheet 2, Bousquet-Joannès (in four sheets), Bousquet and Joannès townships, Abitibi and Témiscamingue counties; scale, 1 inch to 1,500 feet	Geology. For Memoir 231, by H. C. Gunning, also French edition, and separate distribution.
614A	Sheet 3, Bousquet-Joannès (in four sheets), Joannès and Bousquet townships, Témiscamingue and Abitibi counties; scale, 1 inch to 1,500 feet	Geology. For Memoir 231, by H. C. Gunning, also French edition, and separate distribution.
615A	Sheet 4, Bousquet-Joannès (in four sheets), Joannès and Rouyn townships, Témiscamingue county; scale, 1 inch to 1,500 feet	Geology. For Memoir 231, by H. C. Gunning, also French edition, and separate distribution.
617A	Soskumika Lake, Abitibi territory; scale, 1 inch to 4 miles	Topography. For separate distribution.
	NEW BRUNSWICK	
477A	Loch Lomond (east half), Saint John and Kings counties; scale, 1 inch to 1 mile	Geology. For Memoir 216, by F. J. Alcock, and separate distribution.
478A	Loch Lomond (west half), Saint John and Kings counties; scale, 1 inch to 1 mile	Geology. For Memoir 216, by F. J. Alcock, and separate distribution.
497A	Saint John, Saint John and Kings counties; scale, 1 inch to 1 mile	Geology. For Memoir 216, by F. J. Alcock, and separate distribution.

Maps Published April 1, 1940, to March 31, 1941—Concluded

Publication Number	Title	Remarks
	NOVA SCOTIA	
616A	New Glasgow, Pictou county; scale, 1 inch to 2,000 feet	Geology. For Memoir 225, by W. A. Bell, and separate distribution.
—	Diagram showing area of Stellarton series, Pictou county; scale, 1 inch to 2,000 feet	Geology. For Memoir 225, by W. A. Bell, and separate distribution.

Maps in Hands of King's Printer, March 31, 1941

Publication Number	Title	Remarks
	NORTHWEST TERRITORIES	
590A	Leith, District of Mackenzie; scale, 1 inch to 4 miles	Topography. For separate distribution.
591A	Gordon Lake South, District of Mackenzie; scale, 1 inch to 1 mile	Topography. For separate distribution.
607A	Fort Smith, District of Mackenzie; scale, 1 inch to 4 miles	Geology. For separate distribution.
618A	Gordon Lake, District of Mackenzie; scale, 1 inch to 1 mile	Topography. For separate distribution.
644A	Gordon Lake, District of Mackenzie; scale, 1 inch to 1 mile	Geology. For separate distribution.
645A	Gordon Lake South, District of Mackenzie; scale, 1 inch to 1 mile	Geology. For separate distribution.
	BRITISH COLUMBIA	
622A	McConnell Creek, Cassiar district; scale, 1 inch to 4 miles	Topography. For separate distribution.
627A	Okanagan Falls, Similkameen and Osoyoos districts; scale, 1 inch to 1 mile	Geology. For separate distribution.
628A	Olalla, Similkameen, Osoyoos, and Kamloops districts; scale, 1 inch to 1 mile	Geology. For separate distribution.
630A	Fort Fraser (east half), Coast district; scale, 1 inch to 4 miles	Geology. For separate distribution.
631A	Fort Fraser (west half), Coast district; scale, 1 inch to 4 miles	Geology. For separate distribution.
	ALBERTA	
652A	Wildcat Hills (east half); scale, 1 inch to 1 mile	Geology. For separate distribution.
653A	Jumpingpound; scale, 1 inch to 1 mile	Geology. For separate distribution.
654A	Bragg Creek; scale, 1 inch to 1 mile	Geology. For separate distribution.

Maps in Hands of King's Printer, March 31, 1941—Continued

Publication Number	Title	Remarks
	SASKATCHEWAN	
576A	Weitzel Lake; scale, 1 inch to 4 miles	Geology. For separate distribution.
577A	Brustad River; scale, 1 inch to 4 miles	Geology. For separate distribution.
578A	Upper Clearwater River; scale, 1 inch to 4 miles	Geology. For separate distribution.
579A	Haultain River; scale, 1 inch to 4 miles	Geology. For separate distribution.
580A	Porter Lake; scale, 1 inch to 4 miles	Geology. For separate distribution.
592A	MacKay Lake; scale, 1 inch to 1 mile	Geology. For separate distribution.
595A	Reindeer Lake; scale, 1 inch to 4 miles	Geology. For separate distribution.
596A	Spalding Lake; scale, 1 inch to 4 miles	Geology. For separate distribution.
599A	Crackingstone; scale, 1 inch to 1 mile	Topography. For separate distribution.
638A	Etomami River; scale, 1 inch to 4 miles	Geology. For separate distribution.
639A	Mari Lake; scale, 1 inch to 1 mile	Geology. For separate distribution.
	SASKATCHEWAN AND MANITOBA	
632A	Flin Flon; scale, 1 inch to 1 mile	Geology. For separate distribution.
633A	Schist Lake; scale, 1 inch to 1 mile	Geology. For separate distribution.
637A	Mafeking; scale, 1 inch to 4 miles	Geology. For separate distribution.
	ONTARIO	
619A	Port Dover; scale, 1 inch to 4 miles	Geology. For Memoir 226, by J. F. Caley, and separate distribution.
624A	Waterloo; scale, 1 inch to 4 miles	Geology. For Memoir 226, by J. F. Caley, and separate distribution.
	QUEBEC	
401A	Opémisca (second edition), east half, Abitibi territory; scale, 1 inch to 1 mile	Geology. For memoir, also French edition, and separate distribution.
593A	Waconichi; Abitibi and Mistassini territories; scale, 1 inch to 1 mile	Geology. For separate distribution.
602A	Opémisca (west half), Abitibi territory; scale, 1 inch to 1 mile	Geology. For memoir, also French edition, and separate distribution.
608A	Mechamego Lake, Abitibi territory; scale, 1 inch to 1 mile	Geology. For separate distribution.
623A	Michwacho Lake, Abitibi territory; scale, 1 inch to 1 mile	Geology. For separate distribution.
625A	Lake Routhier, Rouyn township, Témiscamingue county; scale, 1 inch to 1,500 feet	Geology. For memoir, also French edition, and separate distribution.

Maps in Hands of King's Printer, March 31, 1941—Concluded

Publication Number	Title	Remarks
	QUEBEC—*Continued*	
626A	Lake Dufault, Dufresnoy township, Abitibi county; scale, 1 inch to 1,500 feet	Geology. For memoir, also French edition, and separate distribution.
634A	La Pause; Abitibi and Témiscamingue counties; scale, 1 inch to 1 mile	Geology. For memoir, also French edition, and separate distribution.
635A	Clériсy; Abitibi and Témiscamingue counties; scale, 1 inch to 1 mile	Geology. For memoir, also French edition, and separate distribution.
	QUEBEC AND NEW BRUNSWICK	
620A	Matapedia; Restigouche and Bonaventure counties; scale, 1 inch to 1 mile	Geology. For separate distribution.
	NEW BRUNSWICK	
604A	Salisbury; Westmorland and Albert counties; scale, 1 inch to 1 mile	Geology. For separate distribution.
605A	Alward Brook, Westmorland, Queens, and Kings counties; scale, 1 inch to 1 mile	Geology. For separate distribution.
621A	Campbellton, Restigouche county; scale, 1 inch to 1 mile	Geology. For separate distribution.
640A	Tetagouche River, Gloucester and Restigouche counties; scale, 1 inch to 2 miles	Geology. For Memoir 227, by F. J. Alcock, and separate distribution.
641A	Jacquet River, Restigouche, Gloucester, and Northumberland counties; scale, 1 inch to 2 miles	Geology. For Memoir 227, by F. J. Alcock, and separate distribution.
642A	Petitcodiac (east half), Kings, Westmorland, and Albert counties; scale, 1 inch to 1 mile	Geology. For separate distribution.
643A	Petitcodiac (west half), Kings and Westmorland counties; scale, 1 inch to 1 mile	Geology. For separate distribution.

Other Map-Work in Varying Stages of Progress

—	Title	Remarks
	NORTHWEST TERRITORIES	
1	Fort Resolution, District of Mackenzie; scale, 1 inch to 4 miles	Topography.
	YUKON	
2	Mayo; scale, 1 inch to 4 miles	Topography.

Other Map-Work in Varying Stages of Progress—Concluded

—	Title	Remarks
	British Columbia	
3	Tatlatui, Cassiar district; scale 1 inch to 4 miles.	Topography.
	Alberta	
4	Fish Creek; scale, 1 inch to 1 mile.....	Geology.
5	Wapiabi Creek; scale, 1 inch to 1 mile.....	Geology.
6	Moose Mountain; scale, 1 inch to 1 mile.....	Topography.
	Saskatchewan	
7	Stony Rapids; scale, 1 inch to 4 miles.....	Geology.
8	Porcupine River; scale, 1 inch to 4 miles.....	Geology.
9	Nivens Lake; scale, 1 inch to 1 mile.....	Topography.
10	Forget Lake; scale, 1 inch to 1 mile.....	Topography.
	Manitoba	
11	Wekusko; scale, 1 inch to 1 mile.....	Geology.
12	Athapapuskow Lake; scale, 1 inch to 1 mile.....	Topography.
	Ontario	
13	North Caribou Lake, Kenora district, Patricia portion; scale, 1 inch to 4 miles.....	Topography.
14	Windigo Lake, Kenora district, Patricia portion; scale, 1 inch to 4 miles.....	Topography.
	Ontario and Quebec	
15	L'Orignal; scale, 1 inch to 2 miles.....	Geology.
16	Maxville; scale, 1 inch to 2 miles.....	Geology.
17	Valleyfield; scale, 1 inch to 2 miles.....	Geology.
	Quebec	
18	Brock River, Abitibi and Mistassini territories; scale, 1 inch to 4 miles.....	Topography.
19	Assinica Lake, Abitibi and Mistassini territories; scale, 1 inch to 4 miles.....	Topography.
	New Brunswick	
20	Albert, Albert county; scale, 1 inch to 1 mile...	Geology.
21	Moncton; Westmorland and Albert counties; scale, 1 inch to 1 mile.....	Geology.
22	Hillsborough; Albert and Westmorland counties; scale, 1 inch to 1 mile.....	Geology.

In addition to the foregoing, the geological compilation of a large part of the Province of Quebec, included within latitudes 45° 00′ to 50° 30′ and longitudes 61° 00′ to 79° 30′, was developed to an advanced stage; also fifty-three map and other figure drawings were prepared for reproduction by zinc-cut process for illustrating reports, papers, and memoirs; other draughting and related work necessary for staff, war departments, and public use amounted to thirty-five items.

Two senior map draughtsmen were loaned to the Department of National Defence for a period of 2 months each, and one to Hydrographic and Map Service for 11 months; three senior copperplate map engravers were superannuated.

NATIONAL MUSEUM OF CANADA

The National Museum of Canada carries on investigational and educational work in the field of natural history. It maintains exhibition halls, publishes bulletins on the results of its surveys and researches, and distributes visual aids, such as lantern slides and motion pictures, illustrating its activities. It comprises the Anthropological Division, the Biological Division (including the National Herbarium), and the Ornithological Division.

Field work was temporarily discontinued, as an economy measure, and instead, the efforts of the staff were devoted to the continuation of the systematic study of the museum material on hand.

In the exhibition halls the third of a series of habitat groups was completed. This features a group of polar bears in a typical Arctic setting.

Donations, exchanges, and other co-operative assistance, which were so generously given to the Museum, are hereby gratefully acknowledged.

ANTHROPOLOGICAL DIVISION

D. Jenness, Chief of the Division, and C. M. Barbeau, ethnologist, were seconded to the Dependents' Allowance Board from February 1940 to January 1941. After their return to the Museum, Mr. Jenness completed a report on the material culture of the Copper Eskimos and began a study of the Indian rock carvings on the Pacific Coast; and Mr. Barbeau prepared two soldiers' song-books for the Canadian army, one in English and one in French, and commenced a monograph on the argillite carvings and the silver work of the Pacific Coast Indians.

W. J. Wintemberg studied the material he had excavated a few years earlier at the prehistoric Indian village near Middleport, Ontario. He completed his report on this site before his retirement on January 1, 1941.

J. D. Leechman completed the reorganization of the exhibition halls, and transferred the specimens in storage in the Blyth building, Frank Street, to the Vimy building on Sparks Street. He selected and displayed a series of war pictures in the entrance hall of the Museum and commenced a report on some Eskimo sites excavated by him in Hudson Strait in 1935 and 1936.

BIOLOGICAL DIVISION

R. M. Anderson, Chief of Division, continued research work on the scientific status, past and present distribution, ecological relations, and economic values of the mammal life of Canada. The additions to the mammal collections numbered 154. This is considerably less than for several years past and is due to the cessation of Museum field work in the different provinces and to general conditions, which have changed the status of private individuals interested in the activities of the National Museum. The catalogued collection of mammals totalled 17,097 specimens on March 31, 1941, any and all parts (skin, skull, skeletal parts, or in liquid preservation) being listed under the same catalogue number.

The cessation of field activities owing to the war has provided an opportunity to concentrate on arrears of office and laboratory work. Much work was done in the specific determination of specimens that had been in a doubtful status pending completion of surveys in various localities. Some collections were supplied with additional labels and made more useful for quick reference.

Clyde L. Patch and Claude E. Johnson finished construction of a polar bear habitat group, now installed in the mammal hall. It is 23 feet wide by 13½ feet deep, with panoramic background 44 feet long by 18 feet high, depicting ice, sea, and sky, with ice pack represented in the foreground. The group shows adult male and female polar bear with two cubs, and one ringed seal, the polar

bears having been collected by members of the Canadian Arctic Expedition in Beaufort Sea region in 1914-15. Other smaller animals were added to the exhibition collections. The general preparation of smaller mammals and birds, many of them of considerable scientific value, was continued. Fourteen additions and replacements were mounted for the school loan collections, and 317 mammals and birds were loaned to educational institutions to be used as aids in art work and visual nature study. A few reptiles and amphibians were added to the herpetological collection.

Several temporary exhibits of special interest were arranged and exhibited from time to time in the front lobby of the Museum, including the first recorded find of nest and eggs of Ross's goose, taken near Perry River, N.W.T., in the summer of 1940, and presented through R. H. G. Bonnycastle of Hudson's Bay Company; and 44 old whale-oil, camphene, candle, and other sorts of antique Canadian lamps loaned by W. J. Wintemberg. Line drawings, departmental signs, coloured lantern slides, plaster and rubber moulds, and casts of scientific material were prepared, and a large amount of Museum material was labelled and numbered.

A. E. Porsild was detailed for special duty outside the Department, but until May 20, 1940, when he left the Division, he continued routine work in the National Herbarium. He returned December 30 and continued work on Canadian botany for the remainder of the fiscal year. Late in May most of the front room space of the National Herbarium was given over to the Postal Censorship Branch.

Miss H. T. Harkness continued labelling, mounting, and inserting botanical material in its systematic place in the collection, 4,798 sheets being thus mounted and over 1,000 labelled. More than 1,000 mounted sheets were repaired; 3,288 specimens were distributed to other herbaria on regular exchange; 1,610 specimens were loaned for study to other botanical institutions in the United States and Canada; and 580 specimens were borrowed for study. New accessions totalled 2,471 specimens, increasing the number of specimens in the National Herbarium to 160,426.

Due to the war, the use of the Herbarium by visiting botanists declined to some extent. A total of 84 visitors consulted the Herbarium, and those who carried out more extended studies spent 17 full days there. About 200 letters were written dealing with various requests for botanical information.

In February 1941 a most valuable donation was made to the National Herbarium by Dr. Francis H. Gisborne, K.C., of Ottawa. This consisted of a first edition of the very rare *Flora Londinensis*, in six folio volumes, containing 419 hand-coloured plates with letter-press and, in addition, 20 folios containing British plants, some collected in 1791, and still in excellent condition. This collection is of great historical value and when properly indexed will be most valuable also for taxonomical work.

Professor Thomas M. C. Taylor, Department of Botany, University of Toronto, continued work on the flora of the north shore of Lake Superior, and reported in March that about 10,000 specimens from Thunder Bay district had been determined and were ready for attachment of the printed labels. The systematic work by Professor Taylor and the ecological reports by Professor Robert C. Hosie, Faculty of Forestry, University of Toronto, on five seasons of botanical work in the Lake Superior region, will add much to the knowledge of the area.

ORNITHOLOGICAL DIVISION

P. A. Taverner, Chief Ornithologist, reports that the work of the Division was concentrated upon rearranging, studying, and systematizing existing collections, and in perfecting various filing and bibliographical systems. There

were numerous requests from the public for ornithological information. Material has been lent to and borrowed from other public institutions and research scientists for the purpose of study. A number of technical reports on the results of the study of Canadian birds were prepared and several of these were published in ornithological periodicals.

EDUCATIONAL WORK

Educational work is one of the most important of the activities of the National Museum. It reaches all classes of people in every province of the Dominion. This is evidenced by the increasing demands made by the public upon all phases of the Museum's educational facilities. These facilities are made available to the public through exhibits in the Museum halls and by direct distribution of suitable material to educational and other institutions studying natural sciences.

VISITORS AND SCHOOL VISITS

The exhibits are made up of specimens selected for their educational value, and carry labels in non-technical language. The exhibition halls were visited by more than 133,000 persons. In addition, thousands of junior and senior school classes came in organized groups. As an example, the Ottawa Public School Board continued its weekly classes in biology, anthropology, and palæontology. There was a total attendance at these classes in the Museum of 7,440 pupils.

LECTURE HALL

The National Museum maintains a lecture hall equipped with motion picture projectors and a projection lantern. During the year, in addition to its use by the Museum, there were 83 reservations of the hall by scientific or educational organizations. A total of 16,062 persons attended these meetings.

LECTURES AND MOTION PICTURE PROGRAMS

As part of its service to the public, the National Museum organizes each year a program of lectures and motion pictures related to its activities. Two series of lectures were given during the year. The Lecture Committee, having in mind the importance of presenting to the public information on the activities of the Armed Forces, arranged, in addition, two lectures and one program of motion pictures, with the co-operation of the Royal Canadian Navy, the Royal Canadian Air Force, and the National Film Board of Canada.

The total attendance at the children's Saturday morning lectures was 10,600 and was 6,000 at the Wednesday evening lectures for adults.

Following is a list of the lectures:

India's Three Hundred and Sixty Millions, by Reverend Charles D. Donald, B.A., B.D., Ottawa.
Around the Year with Ottawa Birds, by Hoyes Lloyd, M.A., Superintendent, Wild Life Protection, National Parks Bureau, Ottawa.
British Commonwealth Air Training Plan, by Flying Officer N. A. Nunn, Headquarters, Air Ministry, Ottawa.
Glimpses of our National Parks in Colour, by R. J. C. Stead, Superintendent, Parks and Resources Publicity, National Parks Bureau, Ottawa.
With Williamson Beneath the Sea (Motion Picture).
Documentary films—Britain at War, by John Grierson, Government Film Commissioner, National Film Board, Ottawa.
Mexico, by Dr. G. M. Geldert, Ottawa.
The Navy in Wartime, by Commander F. L. Houghton, Royal Canadian Navy, Ottawa.
Iceland, by Reverend H. I. S. Borgford, Ottawa.

MOTION PICTURES AND LANTERN SLIDES

Motion pictures and lantern slides, when not in use at the National Museum, are lent to other museums, scientific societies, educational institutions, and other related organizations throughout Canada. These films and slides were seen by 185,302 persons during the year.

MISCELLANEOUS

Considerable information was conveyed by correspondence to meet inquiries about the Museum's activities, and extensive co-operation was given in the identification and loan of specimens and in the selection and loan of photographs to illustrate scientific and popular publications and textbooks.

BUREAU OF MINES

The Bureau of Mines is a central technological and economic research organization, its investigations ranging from the examination and treatment of ores from prospective mines to the many problems related to the economic utilization and marketing of mine products. It is completely equipped at Ottawa with large-scale experimental ore dressing, fuel, and ceramic laboratories in which are applied the most recent developments in the technique of ore and mineral treatment.

The Bureau has five main divisions, namely, Metallic Minerals, Industrial Minerals, Fuels, Economics, and Explosives. It also has an administrative unit and a maintenance section, the latter equipped with mechanical shops and serving the laboratories.

The reviews of the year's activities by the chiefs of divisions are of particular interest for the evidence they provide of the use made of the Bureau's facilities in the war effort. In the change-over in its services from a peacetime to a wartime basis little difficulty was encountered, as most of its laboratory equipment can be used equally as well for war work as for the regular work of the Bureau. This, and the fact that a wealth of information on minerals and their products had already been acquired, enabled the Bureau to attend to requests for investigations from the war departments and organizations and from the war industries with a minimum of delay. By the end of the fiscal year practical use had already been made of the results of several of the investigations.

During the fiscal year, 18,281 copies of Bureau of Mines reports, memorandum series, lists of mines, metallurgical works, etc., were distributed; 55,525 mimeographed sheets were printed, and 10,000 notification cards were sent out.

ECONOMICS DIVISION

The Division of Economics is primarily a central clearing-house for all information related to mineral resources and their economic development and use. This information is being assembled from all available sources for study and compilation to form the basis of what will eventually be a comprehensive inventory of Canada's mineral resources. It is applied to practical service through the medium of special reports prepared for distribution to the industry; of economic studies and investigations as required by the Government in dealing with problems of mineral interest; and in replies to inquiries by correspondence or otherwise.

The Chief of the Division was occupied in part during the early part of the year with work of interdepartmental committees and of committees of national mining organizations on matters pertaining to strategic minerals and to other mining problems related to Canada's war effort. Since the establishment in June of government control of minerals and other materials, which was found to be essential for the maximum effective development of the rapidly growing armament program, practically his entire time was occupied in the office of the Metals Controller on work of a technical and economic advisory character.

The Division has otherwise facilitated the work of mineral controllers by furnishing information from its records, and by making special investigations and studies as requested. The latter included a survey of the non-ferrous scrap metal situation, requiring 6 weeks' field work by one of the senior officers in

the Toronto, Hamilton, and Montreal areas, and his attendance at several conferences; the preparation of a report on industrial diamonds in the mechanical industries, with special reference to Canadian conditions; a study of Canada's tin situation, with particular reference to the bearing of the large tin purchases being made by the United States Government for the accumulation of emergency wartime reserves upon the availability of supplies for Canada; an investigation with reference to the effect of diverting for war needs aluminium that would otherwise be required for certain civilian use; and several statistical studies relating to a number of minerals, including fuels.

Following a conference, in July, of representatives of the Government, the Bank of Canada, and the Canadian gold mining industry, with reference to the need for increasing the industry's already important contribution to Canada's war effort, two officers of the Division visited a large number of the gold mines of Ontario and Quebec as representatives of the Deputy Minister, to obtain first-hand information on all factors relating to production, and to consult with the mine managers on the possibilities of effecting increases in output. The data collected during the survey, which was subsequently extended to the whole of the Dominion, provided the basis of the preparation for the information of the Government and of its financial advisers, several months before the end of the year, of a very close estimate of Canada's gold production in 1940. The survey has also made possible the preparation of a dependable estimate of the production to be expected in 1941.

The annual survey of the deliveries of fuel oil for consumption in the several provinces was continued. The compilation of the 1939 survey was completed in September and a tabulated summary of its results was printed and distributed early in October. A survey was also made of bunker coal deliveries along the St. Lawrence River and the Great Lakes, and a report thereon was completed and submitted on May 31. These surveys, made largely for the Dominion Fuel Board, involved one month's field work in Quebec and Ontario, and afforded first-hand information on current developments in the distribution and use of fuel oils.

A study was made of the probable effect upon the Canadian silver mining industry of the passage by the United States Congress of a Bill that had been introduced, providing for the repeal of the Silver Purchase Act. A further study of the estimated costs of a large-scale pipeline movement of Turner Valley crude petroleum to Ontario was also made to supplement the investigation of the preceding year.

Special reports on mining properties were prepared for the information of the Deputy Minister in assisting the Commissioner of Income Tax in dealing with applications received under Section 89, Income War Tax Act, which authorizes a 3-year exemption of new metalliferous mining companies from Dominion corporation tax from the commencement of commercial production. Reports were also prepared for the Deputy Minister on certain questions arising from the administration of this section of the Act.

Material was assembled for use at the Conference of Dominion and Provincial Ministers of Mines held at Ottawa in mid-January to review the underlying causes of the recent declining activity in prospecting and mineral exploration in Canada, and to consider practical measures for encouraging a renewed interest in this highly important field of mining development.

Some 1,350 inquiries for information on mining properties and on a wide variety of mining subjects were answered. Interviews were given to a large number of mineral producers and others in search of information pertaining to mineral resources, development, markets, etc., particularly in relation to the minerals of war importance. Various articles or papers on subjects pertaining to the different phases of mineral development were prepared for publication by the press, for presentation at meetings of technical associations, or for departmental use.

One hundred and thirty-eight mineral samples were received, examined, and reported upon. These samples included 27 molybdenum ores, 21 tungsten ores, 3 chromium ores, 30 mercury ores, 23 manganese ores, 23 diatomite, 1 corundum, 1 slate, and 9 other minerals. An officer of the Division spent about 10 days in examining chromite deposits in the Province of Quebec. Two others were successively in attendance at the mineral exhibit in the Canadian Pavilion at the New York World's Fair during part of its second season.

The annual review of the Canadian mining industry for 1940, by individual minerals, was in course of preparation at the end of the year. Lists of the coal mines of Canada, and of Canadian iron and steel works were published, and a list of peat producers was mimeographed for distribution. Similar lists of Canadian metallic mineral and industrial mineral milling plants were also in preparation.

Staff Changes. The Division lost four of its staff by retirement on superannuation, and in addition to the diversion of its Chief to work at the Metals Controller's office, it has temporarily lost the services of an engineer who was released on loan to the Priorities Division of the Department of Munitions and Supply, and of a senior map draughtsman to the Gauge Division of the National Research Council.

Library

The technical reference library of the Bureau of Mines is attached to the Division. It reports the following additions:

Books and pamphlets ordered	170
Bureau of Mines reports added to the circulating division	26
Canadian Government documents—individual issues (by exchange and gift)	2,594
British and Foreign Government documents—individual issues (by exchange and gift)	1,121
Scientific societies' bulletins, proceedings, and transactions—individual issues (by exchange and gift)	1,538
Periodicals (other than scientific societies and British and Foreign publications)—individual issues	1,950
Trade catalogues (by gift)	124
Periodicals and annuals subscribed for	210
Annuals, continuations and periodicals (by gift)	385
Cards added to the catalogue	923
Volumes bound	149
Recorded loans	4,179

Draughting Section

The Draughting Section of the Bureau, which is also part of the Division, reports the following work performed:

A map of the coal areas of Cumberland County, Nova Scotia, was drawn and prepared for reproduction to illustrate a report, Cumberland County Coalfield, Memorandum Series No. 78. Thirty-three graphs and flow-sheets were prepared and traced for reproduction in the same report. One chart was prepared and traced for the Dominion Fuel Board, and eighteen tracings were made for the Explosives Division.

In addition, 520 photostat prints and 986 blue-print negatives and tracings were made.

METALLIC MINERALS DIVISION

The Metallic Minerals Division is organized to assist the mining and metallurgical industry in solving problems relating to the treatment of ores and to the production of non-ferrous and ferrous metals and alloys, in particular iron and steel. This Division has the only laboratories in Canada that are staffed and equipped to carry out such work.

The effort being made to increase gold production and to obtain a domestic supply of strategic war minerals has greatly increased the work required of the Division's laboratories, with the result that it has been necessary for the industry to provide additional staff, including labourers, mechanics, engineers, and chemists to assist in and to expedite the work on certain important investigations. Staff has also been lent to the Division from other Divisions of the Bureau of Mines, and from the Department of National Defence. This help has made it possible to undertake and complete work that otherwise could not have been handled.

Much less time than is desirable can now be given to this type of work owing to the many demands originating from Government departments concerned with the prosecution of the war and to requests to investigate new processes for the production of materials entering into munitions. It has also been necessary to use the staff and equipment to process materials possessing highly explosive properties.

Twenty-five per cent of the engineering staff and 30 per cent of the chemical laboratory staff were occupied on technical research in respect to armament production, and as a service to the Department of National Defence (Navy, Army, and Air Force), the Department of Munitions and Supply, and the Joint Inspection Board of the United Kingdom and Canada. Among the principal investigations carried out for the Department of National Defence were those in connection with the manufacture of the Bren gun and of track-links for Universal Carriers. Difficulties in the production of track-links in Canada were encountered by Canadian manufacturers and, during an investigation on the English type of link required, a steel link was developed in the laboratories which, when tested under actual use, gave superior performance. This link is now in use and the English type of link is also being successfully produced.

Confidential reports were prepared on processes and materials for the Metals Controller and other wartime boards and individuals. This and the regular work of the Division necessitated considerable field work both in the United States and in Canada.

In addition to the reports issued by the Division covering the results of investigations, the following memoranda and reports on the physical and chemical properties of metals and alloys were prepared in furtherance of the war effort:

Information on:

Hard facing materials. (To the Department of Transport, Canada.)
Thermo-alloy process of steel manufacture. (To the Commercial Intelligence Service.)
Methods used to produce calcium molybdate and ferro-molybdenum. (To the Pan-American Alloys Co., Ltd.)
Sources of casting copper of high purity for shell manufacturing. (To the Ottawa Car and Aircraft Co., Ltd., Ottawa.)
Brass and manganese bronze. (To the Department of National Defence.)
Heat resisting steel. (To the Royal Canadian Navy, Ottawa.)
The type of high speed steel tools used in rough machining 9·2 shells. (To Mr. B. B. Weaver, Montreal.)
The use of steel substitute in the fabrication of Lysander aircraft. (To the Royal Canadian Air Force.)
Structural steels. (To the Harbour Commission.)
The inspection of wrought iron chain. (To the Ottawa Electric Railway, Ottawa.)
Brass screws for aircraft; on steel substitutes. (Royal Canadian Air Force, Ottawa.)
The use of stainless steel springs for helmet linings. (To the Department of National Defence.)
Composition of stainless steels. (For J. S. C. Shotwell, Ottawa.)
Ferro-alloys. (To the Harbour Commission.)
Chrom-X. (To the British High Commissioner in Ottawa.)
Steel substitutes. (To the Royal Canadian Air Force.)
Special bridge circuits. (To the Fuels Division.)

Memoranda on:

The manufacture of high-alumina cements in the blast furnace.
The parts used for hand-operated gun winches.

Close Checking on the Control of the Production of War Materials

The number of tests were as follows:

—	Aluminium alloys	Iron alloys	Copper alloys
Stress-strain relationships	171	87	.....
Hardness tests	.....	776	89
Other physical tests (tensile, bend, impact, hammering tests, etc.)	102	348	36
Heat treatment	34	926	.....

Examinations:	
Photomicrographs	212
Macroscopic photographs	48
Radiographs	72
Polished specimens	155
Chemical analysis (sampling)	221
Number of test pieces machined for physical tests and microscopical examinations	899

The greater part of these tests were made for the following concerns:

British Air Commission:

From the Inspector at the Aluminum Company of America: stress-strain relationships, 50; heat treatments, 16.

From the Inspector at the Ottawa Car and Aircraft Company, Limited, Ottawa: stress-strain relationships, 10; examinations, 23.

From the Inspector at Fairchild Aircraft Company, Limited, Longueuil, Que.: stress-strain relationships, 6.

From the Inspector at the Canadian Car and Foundry Company, Limited, Montreal; stress-strain relationships, 18; other physical tests, 7.

From the Inspector at Canadian Vickers: stress-strain relationships, 5.

From the Inpector at Canadian Associated Aircraft, Limited, Montreal: stress-strain relationships, 9.

From the Inspector at Canadian Car and Foundry Company, Limited, Fort William, Ont.: stress-strain relationships, 21; other physical tests, 56; examinations, 1.

From the Inspector at the Aluminum Company of Canada, Limited, Kingston, Ont.: stress-strain relationships, 8; other physical tests, 43.

From the British Air Commission: stress-strain relationships, 55; other physical tests, 42; heat treatments, 8.

Department of National Defence:

From the Hall Machinery Company, Sherbrooke, Que.: physical tests, 53; heat treatment, 1.

From the Inspector at the Brewster Aeronautical Corporation, Long Island City, N.Y.: physical tests, 4.

From the McKinnon Industries, Limited, St. Catharines, Ont.: physical tests, 11; examinations, 46.

From the Department of National Defence: stress-strain relationships, 53; hardness tests, 209; other physical tests, 188; examinations, 82; heat treatments, 38.

From Royal Canadian Navy: physical tests, 4; examinations, 2.

From Royal Canadian Air Force: physical tests, 8; examinations, 2.

Joint Inspection Board of United Kingdom and Canada: Hardness test, 1; other physical tests, 9; examinations, 1.

Department of Munitions and Supply: Hardness tests, 80.

Department of Transport: Steel examinations, 3

Joliette Steel, Limited, Joliette, Que.: Steel examinations, 8.

Sorel Steel Company, Limited, Sorel, Que.: Steel examinations, 2.

Mis-Can-Ada Manufacturing Company, Limited, Ottawa: Heat treatments, 125; hardness tests, 44.

Dominion Engineering Company, Limited.: Impact determinations, 2.

Ketchum Manufacturing Company, Limited, Westboro, Ont.: Steel hardness tests, 2.

Preston East Dome Gold Mines, Limited: Examination of a white iron grinding ball.

Department of Trade and Commerce: Examination of an X-metal claimed to be the source of a bullet-proof material.

Mr. Anderson, Saskatoon, Sask.: Determination of hardness of four copper specimens.

Canadian National Railways, Ottawa: Examination of an exploded "Pinsch Gas" tank.

Hull Iron and Steel Foundries Company, Limited, Hull, Que.: Examination of eight steel track links.

Quyon Molybdenite Company, Limited, Quyon, Que.: Examination of a ferro-molybdenum sample.

Renfrew Electric Refrigerator Company, Limited: Hardness determinations, 4.

Union Drawn Steel Company: Hardness determinations, 3.

J. Trudeau, Ottawa: Examination of steel.

International Harvester Company, Limited, Hamilton, Ont.: Examination of fourteen track links.

National Research Council: Hardness determinations, 5.

Alexander Fleck, Limited, Ottawa: Examination of a chromium steel.

Miscellaneous

Sergeant Reddy, Toronto, and Mr. Anderson, Saskatoon, Sask.: Examination of two claims of "copper hardness."

Ottawa Car and Aircraft Company, Limited, Ottawa: Calibration of two temperature recorders and two thermo-couples.

Quyon Molybdenite Company, Limited, Quyon, Que.: Calibration and repair of one thermo-couple.

Smith-Nemo Company, Hull, Que.: Thermostat calibration.
Investigation of the effect of testing variables on proof stress determinations.
Work on the accuracies of tensile and impact test machines.
Study of the methods of determining proof stress in aircraft alloys.

Gauges.—Heat-treated and tested for hardness, 367 gauges (29 for the Department of National Defence, 326 for the John Hay and Co., Ltd., Ottawa, 12 for Dr. Macaulay, Ottawa).

Plating.—Chromium deposition.—30 snap, plug and ring shell gauges; 3 thread gauges.
Copper deposition.—300 track pins; 5 steel forgings.

The chemical laboratories completed analyses on 6,671 samples requiring 21,904 determinations. The samples were made up from the following:

—	Number of samples	Per cent of total
Metallic mill products	4,922	73·78
Pyrometallurgical Laboratory	221	3·31
Industrial Minerals Division	451	6·76
National Defence	762	10·26
Fuel Testing Division	47	0·70
Bureau of Geology and Topography	97	1·46
Custom assays	249	3·73
	6,749	100·00
Total determinations	21,904	.....
Total gold assays	4,454	20·34
Total silver assays	568	2·59

Determinations made on samples of war supplies, etc., during the year:

	Samples	Determinations
Department of National Defence—		
Miscellaneous sources	460	3,308
Atlas steels for Bren gun	154	2,100
British Air Commission	91	893
War Supply Board	6	96
British Supply Board	2	12
Pyrometallurgical Laboratory:		
Samples from problems related to war supplies production	49	244
Total	762	6,653

From the viewpoint of the time required to make the determinations, this represents 30 per cent of the work of the chemical laboratories staff.

Following is a list of the reports issued covering the results of laboratory investigations on various products submitted.

Ore Dressing:

Flotation concentration of copper-lead-zinc ore from the Dominion No. 1 Mine, Woodstock, N.B. Hatfield-Kyle, Ltd., Toronto. (January 24, 1940.)

Flotation, elutriation, and cyanidation of a gold ore from the Tyranite Mine, Gowganda, Ont. (January 19, 1940.)

Ore from section 6, township 20, range 17, west of 6th meridian, British Columbia. J. A. Desrosiers, Kamloops, B.C. (February 2, 1940.)

Gold ore from the Century Mining Corp., Ltd., at Elbow Lake, Man. February 3, 1940.)

Jig and blanket concentration of a gold ore from Warne Bay, Vancouver Island, B.C. (February 5, 1940.)

Microscopic examination of eight samples of manganese-bearing material from the Magdalen Islands. J. W. Sorere, Toronto. (February 7, 1940.)

Low-grade cobalt ore from Kehoe Township, Algoma District, Ont. Dr. J. E. Gimby, Sault Ste. Marie. (February 19, 1940.)

Gold ore from the Tiblemont Consolidated Mines, Limited, Tiblemont Island, Que. (February 15, 1940.)

Microscopic examination of sample of low-grade ore from the Sullivan Consolidated Mines, Ltd., Sullivan Post Office, Abitibi, Que. (February 19, 1940.)

Preliminary report—concentration of hand-picked scheelite ore from the Bridge River Area, B.C. (February 27, 1940.)

Concentration and cyanidation of an arsenical gold ore from the Tamarac Mine, Ymir, B.C. (February 23, 1940.)

Gold ore from the Roybell Mines, Ltd., Clericy Township, Abitibi County, Que. (February 23, 1940.)

Flotation of a lead-zinc ore from the Cousin Jack Claims, Boulder Creek, near Tulameen, B.C. (February 29, 1940.)

Experimental tests to determine the nature of the refractory gold in a sample of mill tailing from the Sand River Gold Mining Co., Ltd., Beardmore, Ont. (March 1, 1940.)

Flotation tests on a sample of tailing from the dump of the former Green Stabell mine, Dubuisson Township, Abitibi County, Que. (March 4, 1940.)

Flotation tests on sample of iron oxide produced in a pyrite burner at the plant of the Consolidated Paper Corporation, Limited, Three Rivers, Que. (March 1, 1940.)

Cyanidation tests on table concentrate from the Broulan Porcupine Mines, Ltd., Pamour, Ont. (March 11, 1940.)

Amalgamation of gold ore from claims on Marie Lake, North of Flin Flon, Manitoba. H. Ellgring, Flin Flon. (March 15, 1940.)

Concentration and cyanidation of a gold ore and a mill tailing from the Chesterville Larder Lake Gold Mining Co., Limited, Larder Lake area, northern Ontario. (March 12, 1940.)

Concentration and cyanidation tests on a sample of mill tailing from the De Santis Porcupine Mines, Ltd., Timmins, Ont. (March 19, 1940.)

Gold ore from the Century Mining Corporation, Limited, Elbow Lake, Man. (March 21, 1940.)

Miscroscopic examination of sample of panner concentrate from the Noranda Mines, Limited, Noranda, Que. (March 27, 1940.)

Gold ore from the Sullivan Consolidated Mines, Limited, Dubuisson Township, Que. (March 25, 1940.)

Concentration of ferrochrome from the Chromium Mining and Smelting Corp., Limited, Sault Ste. Marie, Ont. (April 2, 1940.)

Cyanidation and amalgamation of a gold ore from the Kudor Mines, Ltd., Bannockburn, Hastings County, Ont. (March 30, 1940.)

Amalgamation and flotation of a gold ore from a claim on Caviar Lake, Kenora District, Ont. Claim K-8482, E. Krisko, Norman, Ont. (April 8, 1940.)

Infrasizing a sample of cyanide tailing from the Francoeur Gold Mines, Limited, Arntfield, Que. (April 12, 1940.)

Flotation of zinc-iron tailing from cyanide treatment, Ymir Yankee Girl Gold Mines, Limited, Ymir, B.C. (April 15, 1940.)

Concentration of molybdenite ore from the Superior Molybdenum Company, Limited, Sault Ste. Marie, Ont. (April 22, 1940.)

Flotation tests on a sample of molybdenite ore from the Loveway-Reed property, Taweel Lake, B.C. (April 24, 1940.)

Amalgamation and cyanidation of a gold-quartz ore from Herb Lake, Man. (April 25, 1940.)

Gold ore from the Naybob Gold Mines, Limited, Timmins, Ont. (April 27, 1940.)

Cyanidation of a gold ore from the Powell Rouyn Gold Mines, Limited, Noranda, Que. (May 3, 1940.)

Concentration and cyanidation of a gold ore from the International Mining Corporation (Quebec), Limited, Senneterre, Que. (May 2, 1940.)

Gold ore from Senator-Rouyn, Limited, Rouyn Township, Que. (May 4, 1940.)

Concentration tests on a sample of scheelite ore from Lake Charlotte, Halifax County, N.S. (May 9, 1940.)

Cyanidation and flotation of a gold ore from the Yama Gold Mines, Ltd., Boston Creek, Larder Lake district, Ont. (May 10, 1940.)

Mode of occurrence of gold in cyanide mill tailing from the Sullivan Consolidated Mines, Ltd., Sullivan Post Office, Que. (May 15, 1940.)

Concentration and amalgamation of a gold ore from the White Star Mine, Zeballos, B.C. (May 13, 1940.)

Jig concentration of cobalt-silver mill tailing from Peterson Lake, Cobalt, Ont. (May 23, 1940.)

Concentration and cyanidation tests on samples of gold ore from the Uchi Gold Mines, Ltd., at Uchi Lake, Ont. (May 17, 1940.)

Experimental tests to determine the association of the silver in a sample of flotation tailing from the Berens River Mines, Limited, at Favourable Lake, Ont. (May 16, 1940.)

Preliminary microscopic examination of sample of gold ore from Greenlee Mines, Limited, Patricia District, Ont. (May 30, 1940.)

Notes on certain polished sections prepared from samples of ore and tailing from the Falconbridge Nickel Mines, Limited, Falconbridge, Ont. (March 5, 1940.)

Concentration tests on a sample of gold and silver-bearing copper ore from Turriff, Ont. J. C. Ferguson, Renfrew, Ont. (May 22, 1940.)

Placer gravel from Lalonde's Lake, Sudbury Mining District, northern Ontario. O. M. Trano, Director, Onwatin Placer Mining Syndicate, Ltd., 513 Metropolitan Bldg., Toronto, Ont. (May 28, 1940.)

Amalgamation, cyanidation, and calcination of a gold ore from the Negus Mines, Limited, Yellowknife, Northwest Territories. (May 29, 1940.)

847.—Amalgamation of jig middling from Provincial Mine School ore, Val d'Or, Abitibi, Que. (June 4, 1940.)

848.—Concentration of manganese ore from Cowichan Lake, Vancouver Island, B.C. E. Priest, 6550 Angus Drive, Vancouver, B.C. (June 3, 1940.)

849.—Microscopic examination of samples of gold ore from the Cochenour Willans Gold Mines, Ltd., McKenzie Island, Ont. (June 3, 1940.)

850.—Microscopic examination of two samples of gold ore from Bristol Township, Ont. J. R. O'Neill, c/o Elliott House, Toronto. (June 5, 1940.)

851.—Mill tailing from Lapa Cadillac Gold Mines (1937), Ltd., Heva River, P.O., Que. (June 8, 1940.)

852.—Concentration of fluorite from the Cook Claims, Beauchastel Lake, Montbeillard Township, Rouyn-Noranda area, Que. (June 5, 1940.)

853.—Tin ore from the Perseverance Mining and Development Co., Ltd., Rush Lake, Man. (June 10, 1940.)

854.—Pyrite ore from the Ontario Nickel Corporation, Limited, property in Hastings County, Ont. (June 20, 1940.)

855.—Microscopic examination of sample of gold ore from the Getchell Mine, Inc., Red House, Nevada. (June 25, 1940.)

856.—Gold ore from the McMarmac Red Lake Gold Mines, Limited, McKenzie Island, Ont. (June 14, 1940.)

857.—Cyanidation tests on a sample of gold ore submitted by the Central Cadillac Mines, Limited. (June 28, 1940.)

858.—Mill residue from Peterson Lake, Cobalt, Ont. Progress Smelting and Refining Co., Toronto. (June 29, 1940.)

859.—Scheelite-stibnite ore from the Bridge River area, B.C. Edwin Phillips, Minto Mines P.O., B.C. (June 26, 1940.)

860.—Concentration and cyanidation tests on two samples of gold ore from the Kenora mining district, Ont. Kenora Mining and Milling Co., Ltd., Kenora, Ont. (June 21, 1940.)

An Application of the "Chapman Process" on gold ore from the Tyranite Mine, Gowganda, Ont. (April 11, 1940.)

862.—Gold ore from the Santa Fe Gold Mines, Limited, Mine Centre, Rainy River area, northwestern Ontario. (June 28, 1940.)

863.—Concentration tests on a sample of barite ore from Lavant Township, Lanark County, Ont. (July 10, 1940.)

864.—Concentration tests on a sample of manganese ore from the Magdalen Islands, Que. R. F. Hardy. (July 11, 1940.)

865.—Concentration of chromite from the Sterrett Property, Richmond, Que. Northern Exploration Syndicate, Ltd., Montreal, Que. (July 15, 1940.)

866.—Amalgamation and microscopic examination of gold-bearing mill products from the Kenopo Mining and Milling Company, Limited, Kenora, Ont. (July 15, 1940.)

867.—Amalgamation, cyanidation, and calcination of a gold ore from the Con mine, Yellowknife, Northwest Territories. (July 2, 1940.)

868.—Tantalum ore from A. H. Leavitt, Bronte, Ont.

869.—Concentration of nickel-copper ore from the Pacific Nickel Mines, Ltd., Choate, B.C. (July 23, 1940.)

873.—Copper ore from Porter Township, Sudbury District, Ont. Burnard Grover, New York; G. R. Steeves. (July 26, 1940.)

874.—Amalgamation and cyanidation of a gold ore from the Albany River Gold Mines, Limited, Pickle Crow, Ont. (July 15, 1940.)

875.—Magnetic separator rejects from the Wood Cadillac Mines, Ltd., Kewagama, Que. (August 1, 1940.)

876.—Infrasizing test on a sample of cyanide tailing from the Francoeur Gold Mines, Ltd., Arntfield, Que. (August 2, 1940.)

878.—Concentration of a molybdenite ore from Grayhurst Township, Frontenac County, Que. Henri LeRoy, Lac Megantic. (July 27, 1940.)

880.—Mercury and jig concentrates from the Preston East Dome Mines, Limited, South Porcupine, Ont. (August 8, 1940.)

881.—Cyanidation tests on a gold ore from Birch Lake, Patricia District, Ont. (August 6, 1940.)

882.—Gold ore from Williams Claims, Savant Lake, Ont. M. W. MacDowell, 13 Granite Street, Brockville, Ont. (August 19, 1940.)

884.—Placer sands from Beauce County, Que. W. A. Marois, Jersey Mills, St. George, Beauce County, Que. (August 20, 1940.)

885.—Cyanidation, amalgamation, and concentration of a gold ore from the Gold Frontier Mines, Limited, Red Lake, Ont. (August 22, 1940.)

887.—Concentration tests on samples of copper-gold ore from Dungannon Township, Hastings County, Ont. (August 23, 1940.)

888.—Table concentration of barite-fluorspar ore from the Moira Fluorspar Syndicate, Madoc, Ont. (August 26, 1940.)

891.—Gold ore from Lorne Lake, Rice Lake Mining District, Man. A. J. McLaren, Toronto. (September 9, 1940.)

892.—Microscopic examination of ilmenite-magnetite ore from near Mine Centre, Ont., submitted by L. W. Wilson, International Falls, Minn. (August 30, 1940.)

895.—Chemical analyses and gravity separation tests on samples of chromite submitted by C. H. Stockwell, Bureau of Geology and Topography, Mines and Geology Branch, Department of Mines and Resources, Ottawa. (September 5, 1940.)

897.—Spectrographic analyses of five samples of Manitoba rock submitted by John Dryborough, Winnipeg, Man. (September 21, 1940.)

899.—Diamond drill core rejects from the Orenada Gold Mines, Limited, Bourlamaque, Que. (September 27, 1940.)

900.—Cyanidation of a gold ore from the Vicour Gold Mines, Limited, Louvicourt Township, northwestern Quebec. (September 23, 1940.)

901.—Placer gravel from Lalonde's Lake, Sudbury Mining District, northern Ontario. Onwatin Placer Mining Syndicate, Toronto. (October 2, 1940.)

904.—Cyanide residue from roasted flotation concentrate from the O'Brien Gold Mines, Ltd., Kewagama, Que. (October 30, 1940.)

905.—Cyanidation, amalgamation, and concentration of a gold ore from the Bristol Mines, Ltd., Bold Bridge, B.C. (November 20, 1940.)

906.—Gold ore from the Hoyle Gold Mines, Ltd., Pamour, Ont. (November 15, 1940.)

908.—Concentration tests on a sample of rejects from a washing operation conducted on manganese ore by the Atlantic Manganese Corp. in Nova Scotia. (October 16, 1940.)

909.—Concentration and cyanidation tests on a sample of arsenical gold ore from the Cadillac area in Quebec. Central Cadillac Mines, Ltd. (October 21, 1940.)

910.—Sink and float tests, followed by indicative concentration of products, on scheelite ore from the Indian Path Mine, Lunenburg County, N.S. (November 6, 1940.)

912.—Examination of specimen of rock from Aklavik, Northwest Territories. Dr. L. D. Livingstone, Medical Health Officer, Lands, Parks and Forests Branch. (November 7, 1940.)

913.—Concentration and cyanidation of a gold ore from the San Antonio Gold Mines, Bissett, Man. (November 7, 1940.)

915.—Flotation of chalcopyrite-bornite ore from the Granby Consolidated Mining, Smelting and Power Company, Limited, Allenby, B.C. (November 13, 1940.)

917.—Flotation of cobalt and nickel assay rejects from H. Davis, Cobalt, Ont. (November 4, 1940.)

918.—Differential flotation of pyrite-chalcopyrite ore from the Surf Inlet Consolidated Gold Mines, Limited, Surf Inlet, B.C. (November 20, 1940.)

919.—Mill tailing from the Madsen Red Lake Gold Mines, Limited, Madsen, Ont. (November 16, 1940.)

920.—Sink and float tests on a sample of gold-silver-copper ore from Telkwa, B.C. Conwest Exploration Co., Ltd., Vancouver, B.C. (November 20, 1940.)

921.—Roasting and cyanidation of flotation concentrate from the Cochenour Willans Gold Mines, Ltd., McKenzie Island, Ont. (November 30, 1940.)

922.—Gold ore from West Hawk Lake, Man. Thor Gold Mines, Ltd., Winnipeg, Man. (November 30, 1940.)

923.—Amalgamation and concentration of a gold-copper-tungsten ore from the Slave Lake Gold Mines, Limited, Great Slave Lake, N.W.T. (November 26, 1940.)

924.—Mill tailing from the Stadacona Rouyn Mines, Ltd., Rouyn, Que. (November 25, 1940.)

925.—Sink and float tests on a sample of fluorite ore from Whycocomagh, Cape Breton Island, N.S. Dominion Fluorspar Co., Ltd., Madoc, Ont. (November 27, 1940.)

929.—Cyanide residue from the Delnite Mines, Limited, Timmins, Ont. (December 20, 1940.)

930.—Bog manganese ore from the Morash deposit, Caribou Lake, N.S. Ventures, Limited, Toronto. (November 23, 1940.)

934.—Sink and float tests on two samples of fluorite ore from Madoc, Ont. Dominion Fluorspar Co., Ltd., Madoc. (November 29, 1940.)

937.—Cyanidation of a gold ore from the West Malartic Mines, Ltd., Heva, Que. (December 14, 1940.)

938.—Hematite ore from the Belcher Islands, Que. Dominion Fluorspar Co., Ltd., Madoc, Ont. R. T. Gilman. (December 26, 1940.)

940. Concentration of chromite ore from the Port au Port Bay district, Newfoundland, for Springer, Sturgeon Gold Mines, Limited, Toronto. (December 31, 1940.)

941.—Sink and float tests on a sample of gold ore from the Privateer mine, Zeballos River area, Vancouver Island, B.C. (December 27, 1940.)

943.—Comparative concentration tests with rubber and corduroy blankets as used on Canadian gold ores. (January 4, 1941.)

944.—Gold ore from the Brookfield gold district of Nova Scotia. Inspiration Mining and Development Co., Amos, Que. (January 22, 1941.)

945.—Concentration and cyanidation of a gold ore from the Missinaibi property of the Macassa Mines, Limited, in northwestern Ontario. (January 16, 1941.)

947.—Cobalt nickel ore from the H. Shakt mine, Township of Coleman, Trout Lake area, Ont. (January 17, 1941.)

948.—Sink and float tests on a sample of chromite ore from the Sterrett Mine, at St. Cyr, Richmond County, Que. Chromite, Limited. (January 18, 1941.)

952.—Recovery of scheelite from selected ore from the Hollinger Consolidated Gold Mines, Limited, Timmins, Ont. (January 23, 1941.)

954.—Microscopic examination of five specimens of gold ore from the Powell Rouyn Gold Mines, Limited, Noranda, Que. (January 29, 1941.)

959.—Sink and float tests on a sample of fluorite ore from Madoc, Ontario. Moira Fluorspar Mining Syndicate, Ltd., Madoc, Ont. (February 6, 1941.)

Metallurgical:

Tests on ten brass specimens. Department of National Defence, Ottawa. (March 2, 1940.)

Examination of an austenitic manganese steel ball mill liner. Joliette Steel, Limited, Joliette, Que. (March 8, 1940.)

An examination of two gaseous steels. Joliette Steel, Limited, Joliette, Que. (March 15, 1940.)

An examination of steel taken from two parts of a Dilts hydrafiner. Alexander Fleck, Ltd., Ottawa. (March 26, 1940.)

Hardness tests on some Bren gun steels. Department of National Defence, Ottawa. (April 3, 1940.)

Tests made on twelve seamless steel tubes. Department of National Defence, Ottawa. (April 11, 1940.)

An examination of three aluminium alloy forgings. A. E. Marsden, Chief Inspector of Aircraft, British Supply Board, Montreal. (April 18, 1940.)

Proof stress determinations on aluminium alloys. Department of National Defence. (May 9, 1940.)

Report on Phillips X-Ray Tube No. 25/205. Copy sent to Canadian Metalix Co., Montreal. (May 10, 1940.)

Identification of worn numbers on bird bands. Lands, Parks and Forests Branch, Ottawa. (May 21, 1940.)

Examination of two austenitic manganese steels. Joliette Steel, Limited, Joliette, Que. (May 29, 1940.)

"Jonesite," a specially processed white cast iron. Department of Munitions and Supply, Ottawa. (June 7, 1940.)

An examination of four malleable iron tensile test specimens. Department of National Defence, Ottawa. (June 18, 1940.)

An examination of specimens from military vehicle front-axle housings. Department of National Defence, Ottawa. (June 21, 1940.)

Examination of a military vehicle brake drum section. Department of National Defence, Ottawa. (June 27, 1940.)

861.—Experimental work on Universal Machine Gun Carrier malleable iron track links. McKinnon Industries, Ltd., St. Catharines, Ont. (July 6, 1940.)

870.—Examination of an austenitic manganese steel casting. Sorel Steel Foundries, Limited, Sorel, Que. (July 24, 1940.)

871.—Report on section from a manganese steel crushing jaw plate. Joliette Steel, Limited, Joliette, Que. (July 26, 1940.)

872.—Experimental work on Universal Machine Gun Carrier steel track links. Hull Iron and Steel Foundries, Ltd. (July 26, 1940.)

877.—Report on fractured towing hook from Chevrolet F. A. Tractor No. 40-1-1061. (August 3, 1940.)

879.—Hardness test on eight steel wrenches. (August 6, 1940.)

883.—Examination of case-hardened Bren gun breech blocks. (August 12, 1940.)

886.—Report on Bren gun tripod welded sections received from Department of National Defence, Ottawa, Ont. (August 16, 1940.)

An examination of four steel forgings. R.C.A.F., Ottawa. (August 17, 1940.)

889.—Investigational work on Universal Machine Gun Carrier malleable iron track links. (August 29, 1940.)

890.—Examination of a broken front axle housing. Department of National Defence, Ottawa. (September 7, 1940.)

893.—Report on steel helmet submitted by Department of National Defence, Ottawa. (August 30, 1940.)

894.—Report on comparison of tools submitted by Department of National Defence. (September 5, 1940.)

896.—Report on a military truck hub, for C.D.C.I.A. (G), Department of National Defence, Ottawa. (September 19, 1940.)

898.—Examination of six defective aluminium alloy forgings. Inspector-in-Charge B.S.B., Ottawa Car and Aircraft Co. (September 25, 1940.)

902.—Examination of an aluminium alloy stamping. Inspector-in-Charge, B.S.B. Canadian Car and Foundry Co., Fort William. (October 3, 1940.)

903.—Examination of an austenitic manganese steel casting. Joliette Steel, Limited, Joliette, Que. (October 3, 1940.)

907.—Examination of an aluminium alloy extrusion. R.C.A.F., Ottawa. (October 11, 1940.)

914.—Examination of broken aircraft engine parts. Department of Transport, Ottawa. (November 12, 1940.)

916.—Report on comparison of flat wrenches D.C.I.A. (G). (November 13, 1940.)

926.—Examination of six broken welded sheet steel tensile test specimens. R.C.A.F., Ottawa. (November 20, 1940.)

927.—Examination of a cracked military vehicle joint part. Department of National Defence, Ottawa. (November 28, 1940.)

928.—Report on a stub axle from a 2-pounder gun. Department of National Defence, Ottawa. (November 22, 1940.)

931.—Report on cast iron brake drum for Universal Carrier. Department of National Defence, Ottawa. (November 25, 1940.)

932.—Report on drive sprocket for Universal Carrier. Department of National Defence, Ottawa. (November 27, 1940.)

933.—Examination of a broken steel stud from an Indian motorcycle sidecar. Department of National Defence, Ottawa. (November 28, 1940.)

935.—Report on embrittlement of superstructure members for military trucks (galvanized pipe). Department of National Defence, Ottawa. (December 3, 1940.)

939.—Report on failure of leaf spring on military vehicle. United Kingdom Technical Mission. (December 23, 1940.)

942.—Report on failure of heavy armour plate. United Kingdom Technical Mission. (January 3, 1941.)

INDUSTRIAL MINERALS DIVISION

The Industrial Minerals Division is concerned with the industrial, or non-metallic minerals, such as asbestos, feldspar, mica, magnesite, gypsum, salt, and talc, as well as building stones, road metal, clay, and bentonite, and industrial waters.

The three sections of the Division deal respectively with: the resources of industrial minerals, their economic characteristics, mining, marketing, and use; the crushing, grinding, and purification of the minerals; and problems of processing in the manufacture of mineral products, particularly ceramic products.

The Division works in close co-operation with the Departments of National Defence, Munitions and Supply, National Revenue, and Trade and Commerce, and with other Dominion and Provincial Government bureaux. It keeps thoroughly posted on Canadian and world developments in its field by means of reading, research, correspondence, and field investigations. It carries on much testing and experimental work on the properties, processing, and utilization of the minerals and rocks used in the manufacturing and building industries. The results of this work are made available to the public through published reports and bulletins, correspondence, direct consultations, public addresses, and technical articles.

Priority was given during the year to investigations and services pertaining to war minerals and those urgently required as raw materials or processing materials used in manufacturing. Endeavours were made to promote Canadian production as a means of supplying, for domestic consumption or export, those minerals for which the war has created an abnormal demand.

Field investigations pertaining to the occurrence, mining, preparation for the market, and industrial uses were conducted on asbestos, beryl, brucite, celestite, feldspar, fluorite, limestone, mica, nepheline, salt, talc, china clay (kaolin), peat, and other minerals.

A special survey was made of Canadian talc and soapstone with reference to war supplies for the British market at the request of the Department of Trade and Commerce. A survey was also made of the American requirements for mica used in aviation sparkplugs, looking to increased output of such material in Canada, and the information obtained was given to the Metals Controller.

In continuation of the investigation of the potash in the salt mine of Malagash Salt Company in Nova Scotia, a further study was made of the deposit and of the extension of the potash zone as revealed by the diamond drilling done on the recommendation of the Bureau. Laboratory work was conducted to establish the most suitable process for the recovery of the potash and magnesium salts. Considerable laboratory work was also done in an endeavour to remove anhydrite from commercial fishery salt; anhydrite occurring in finely divided form throughout the salt presents a difficult problem.

Much attention was given to the development of Canadian sources of magnesia suitable for high-grade basic refractories and for magnesium metal. Four deposits of brucitic limestone in Quebec were thoroughly investigated and

large samples of brucitic limestone from these deposits and from one in Ontario were processed in pilot plant tests in the Industrial Minerals milling laboratories to recover magnesia. The magnesia so obtained was shipped to industrial plants in Canada and England for commercial-scale testing in the manufacture of refractories, chemicals, insulating material, and magnesium metal. Visits were made to plants in the United States producing magnesia from dolomite, sea water, salt bittern, magnesite, and brucite, and the situation with respect to supplies of magnesia and magnesium was studied and reported.

At the request of the Department of National Defence, field investigations and laboratory tests were conducted on aerodrome soils to determine whether these soils could be rendered sufficiently stable for runway bases and shoulders by a treatment with Portland cement, known as soil-cement stabilization.

Laboratory work was continued on the testing of samples of rocks, mine tailings, gravels, and soils, to determine their suitability for use in the construction of low-cost roads and aerodrome runways.

Peat moss deposits in Nova Scotia, Prince Edward Island, New Brunswick, and in Temiscouata, Kamouraska, and Huntingdon Counties, Quebec, and several deposits in southern Ontario were investigated and a report on this work was prepared for publication. This investigation was a continuation of work of the previous year, which was initiated to promote the production of peat moss in order to meet the demand in Canada and the United States that arose from the cutting off of supply from Europe. A further investigation was made of the peat moss deposits in Temiscouata County, Quebec, with special reference to a proposed use of peat moss in the manufacture of munitions.

The investigation of industrial waters was continued. Seventy-one samples of surface and civic waters were collected and analysed. A report on this investigation covering the period from 1934 to 1940 is in preparation.

At the request of the Naval Services, Department of National Defence, the Bureau of Mines undertook to make, under close tolerance specifications, a large quantity of mineral parts required for an urgent need of the Service. An engineer of the Division was placed in charge of this work. Special equipment was designed and is being set up as rapidly as the units are delivered. Production of the required product began at the end of February and is being increased as rapidly as operators can be trained for the work.

Members of the staff served on the following committees:

Canadian Government Purchasing Standards Committee: Sub-Committees on Plans and Administration; Paint and Pigments Specifications; Refractories Specifications; and Safety Glass Specifications.

Canadian Engineering Standards Association: Main Committee.

Canadian Institute of Mining and Metallurgy: Publications Committee; Executive Committee, Industrial Minerals Division.

American Institute of Mining and Metallurgical Engineers: Executive Committee, Industrial Minerals Division; Mining Methods Committee; and Aviation Committee.

Canadian Ceramic Society, Clay Division (Secretary).

American Ceramic Society, Editorial Committee.

Canadian Committee of Chemical Water Standards (Joint committee of Canadian Institute of Chemistry and Canadian Public Health Association).

Editorial Committee on Water Analysis (Joint committee of American Water Works Association and American Public Health Association).

INDUSTRIAL MINERALS MILLING LABORATORIES

Aside from the regular functions of the milling section, unusually large quantities of material were processed to supply large samples of certain minerals for extensive tests by other research laboratories and industrial plants in the development of products for the manufacture of munitions.

The following operations were conducted for the public and in connection with departmental investigations:

Asbestos. Five tons of asbestos-bearing rock, submitted by Canadian Refractories, Limited, Kilmar, Quebec, was subjected to various separation tests for quantity and grade of fibre and to determine the best process for its recovery.

Barite. Three thousand pounds of barite was pulverized and air-separated to a definite screen fineness for Springer-Sturgeon Gold Mines, Limited, Toronto.

Brucite. Eighty tons of brucitic limestone from Ontario and Quebec properties was processed during July, August, September, and October, to recover the brucite in the form of magnesia. The processing was done in a specially set-up pilot-plant and included crushing and sizing of the rock, calcining in an oil-fired rotary kiln, slaking the lime matrix in a rotary slaker, and recovering the granular magnesia by screening and washing, followed by drying.

Celestite. Seven hundred pounds of celestite from Renfrew County, Ontario, was cobbed, crushed, and pulverized to specified fineness and air separated for H. H. Claudet, Ottawa.

Diatomite. A large sample of diatomaceous earth from near Pembroke, Ontario, was calcined and air separated for G. Ruznyak, Toronto.

Fluorspar. Tabling and flotation tests were made on a sample of fluorite submitted by Dominion Fluorspar Company, Cape Breton, Nova Scotia.

Gypsum. Three hundred pounds of gypsum from Windsor Plaster Company, Limited, Windsor, Nova Scotia, was crushed, pulverized, and calcined. Compressive and tensile tests were made on briquettes made from the resulting plaster.

Reclaiming tests were conducted on a sample of waste calcium sulphate from Trail, British Columbia, for Summit Lime Works, Lethbridge, Alberta.

Magnesitic Dolomite. In addition to the extensive work carried out in the Ore Dressing Laboratories on the concentration of magnesite from Kilmar, Quebec, studies were made of a number of different methods of purification.

Nepheline Syenite. Magnetic purification tests were made on nepheline syenite submitted by American Nepheline Corporation, Lakefield, Ontario, and on nepheline concentrates produced from the same rock in the Ore Dressing Laboratories.

Quartzite. Two samples of quartzite (773 pounds) from J. R. Bonhomme, Montreal, were ground and subjected to washing, air-tabling, and magnetic separation. Sand-blast tests were also made.

Salt. A small sample of fishery salt from Malagash Salt Company, Malagash, Nova Scotia, was crushed and sized and electrostatic tests were made to remove included anhydrite. Jigging and tabling tests were made on a number of larger samples of the same material.

Several flotation tests were made on potash-bearing salt from Malagash for the separation of sylvite and carnallite from halite in a saturated brine medium.

Sand. Sand-blast tests were made on a sample of sand for the Transcona Shops of the Canadian National Railways, Transcona, Manitoba.

Three samples of pit sand from C. A. Fielding, Copper Cliff, Ontario, were examined microscopically and chemically to ascertain whether the quartz content could be increased to a specified percentage economically. Magnetic separation tests were made.

Tests were made on a sample of sand, submitted by E. G. Deveau, Hectanooga, Nova Scotia, to determine its suitability for use as foundry moulding sand.

Tabling tests were made to improve the quality of a sample of glass sand from Ottawa Silica and Sandstone, Limited, Ottawa.

Sandstone. Crushing and washing tests were made on samples of sandstone from Ottawa Silica and Sandstone, Limited, Ottawa; R. J. Ferguson and Sons, Ottawa; and A. Campbell, Bells Corners, Ontario.

A series of tests for the removal of impurities was undertaken on five samples of sandstone from near Gananoque, Ontario, for A. D. Bartlett. The stone was crushed and the resulting sand subjected to various purification treatments, including magnetic separation, washing, attrition, and acid leaching.

Slate. Two samples of slate aggregating half a ton were crushed by different machines to determine the suitability of the slate for roofing granules.

Talc. A sample of talc from Madoc Talc and Mining Company, Toronto, was crushed and subjected to magnet tests.

The following services were rendered for other Government departments:

Half a ton of calcined dolomite was pulverized to -200 mesh for the National Research Council.

Two aluminium castings were sand-blasted to give them a satin finish for the National Research Council.

Four and one-half tons of calcium silicide was ground to specification for the Department of Munitions and Supply.

Owing to insufficient staff, a number of milling problems connected with industrial minerals were assigned to the Metallic Minerals Division.

CERAMIC LABORATORIES

Work on ceramic subjects was again curtailed to some extent to release the engineers for more important duties in other sections of the Division.

Additional data were obtained in respect to the investigation on the physical properties of Canadian building bricks, and the preparation of the final report was completed.

Laboratory work on the physical properties of structural tiles was suspended during the early part of the year, but later the freezing and thawing tests were started.

The investigation was continued on the use of bauxite tailing to improve the refractoriness of firebrick, and preliminary plant trials were made.

Other work on refractories included assistance given to several manufacturers of firebrick by means of tests and advice on raw materials and finished products for the purpose of improving their products; and a minor investigation to determine the factors involved in the production of high-grade refractories from kaolin from a recently discovered deposit in the Gatineau Valley, Quebec.

The investigation on the development of a terra sigillata type of engobe from various Canadian clays and shales for the purpose of improving the surface texture and colour of clay products was terminated during the year. A number of buff-burning and red-burning clays were included in this investigation. The results were communicated to several manufacturers, and plant trials were made. A report covering the investigation was prepared for the records, and a paper was presented before the Canadian Ceramic Society.

Many tests on ceramic raw materials and finished products were made for individuals and industrial companies.

Advice was given regarding the exploratory work on the recently discovered kaolin deposit at Point Comfort, Quebec. Test holes were dug and various ceramic tests were made on the samples collected. Consultations were held with officials of Canada China Clay, Limited, in reference to the development of the kaolin deposit of Lac Remi, Quebec. Samples of refined kaolin and silica sand prepared in the Industrial Minerals milling laboratories were supplied and advice was given on processing problems involved in getting the new washing plant into operation.

Investigative work was carried out in an effort to assist a dental supply company of Toronto in the development of a dental filling material having properties similar to a product, formerly imported, that is now unobtainable because of the war.

Information was prepared from time to time for the Department of National Revenue to serve as a basis for classifying various ceramic articles for customs and excise tax. Opinions were also given as to whether or not such articles were of a class or kind made in Canada.

Considerable petrographic work was carried out in respect to investigations within the Bureau. This included the identification of minerals present in drill cores obtained from drilling operations in brucitic limestone in the vicinity of Farm Point, Quebec; the examination of various products obtained in the tests on the extraction of magnesia from brucitic limestone; the petrographic study of rock samples of magnesitic dolomite from Kilmar, Quebec, upon which flotation tests were made, together with the examination of the various products obtained in those tests; many determinations in connection with the investigation on potash-bearing salt from Malagash, Nova Scotia; and mineral identifications on 41 miscellaneous samples.

The mineral phases in a large number of clinkers were identified petrographically for the National Research Council.

DIVISION OF FUELS

The Chief of the Division and senior technical officers again visited collieries and oil and gas plants in the eastern and western producing fields to discuss technical problems, and attended committee meetings and conferences in Ottawa with other Government organizations relative to the testing and research work on Canadian coals, petroleum oils, and natural gas. Papers and reports were prepared and distributed on: the comparative burning tests of various domestic and steam coals; the physical and chemical survey of coals from collieries in Nova Scotia, Alberta, and British Columbia, and on the improvement of Onakawana lignite from northern Ontario by special treatment.

An investigation of particular wartime significance, as described below, was conducted on Turner Valley crude oil as a source of high octane aviation gasoline and of toluene for the manufacture of explosives. The part-time services of five technical officers were utilized in a consulting capacity on work for the Department of Munitions and Supply and the Department of National Defence—Militia and Air Services. One engineer continued on loan to the Department of Munitions and Supply, another to the Office of the Oil Controller, and a third to the Office of the Coal Administrator.

PURCHASE OF COAL BY SPECIFICATION

Samples submitted regularly by the Department of Pensions and National Health and by the Penitentiaries Branch, Department of Justice, in reference to the purchase of their coal supplies according to specification were analysed. The facilities of the Fuel Research Laboratories were also utilized by the Departments of Munitions and Supply and National Defence in reviewing and advising on coal tenders and in checking the quality of coal deliveries against that guaranteed by contract.

ANALYSIS SURVEY OF COAL AND COKE

In view of the shortage of the buckwheat sizes of Welsh and other European anthracites imported into Canada, an analysis survey of the available and substitute fuels suitable for use as blower fuels was undertaken. This comprised the examination of the physical and chemical properties of the buckwheat sizes of imported Welsh, Scotch, and American anthracites, and of by-product and gas

coke. For the coke, the collection and analysis of samples was extended to the larger, nut, stove, and egg, sizes in addition to the smaller, pea, range, and blower, sizes.

COMBUSTION ENGINEERING INVESTIGATIONS

The routine work in reference to the collection and plotting of data on the degree-day heating load for Ottawa was continued, and two members of the staff attended meetings of the Fire Protection and Health and Sanitation committees of the National Building Code held under the auspices of the National Research Council.

The suitability as blower fuels of selected Canadian and American coals, when used alone and when mixed, in comparison with Welsh anthracite buckwheat coal was studied. Tests in a special furnace for testing clinkering properties, supplemented by tests in a standard hot-water boiler equipped with blower, showed that a semi-anthracite coal from Alberta could be satisfactorily substituted for the buckwheat size of American Red or White Ash anthracite in the 75-25 per cent mixture of Welsh and American buckwheats recently marketed in Central Canada as blower fuel. The two coals must be intimately mixed, however, to maintain the required clinkering characteristics of the Welsh coal. The admixture of selected non-caking high-volatile bituminous coals from Nova Scotia and Alberta with non-clinkering buckwheat sizes of Canadian semi-anthracites and American anthracites makes them satisfactory also as blower fuels in respect to clinkering.

A series of observation burning tests was made on various "domestic" fuels in a station-type stove such as those used in military hutments and other establishments of the Department of National Defence. The tests were of typical anthracite, coke, briquettes, low-volatile bituminous, and Alberta domestic coals and were made to establish their relative merits and general grading in respect to radiant heat, ease of control of burning rate, violent ignition (fire hazard), soot formation, and other factors.

Tests of Onakawana lignite, conducted under the auspices of the Industrial Commission of the Toronto and Northern Ontario Railway Commission, were witnessed by an engineer of the Fuels Division. These were observation and efficiency tests of the lignite alone and in admixture with Canadian bituminous coal in varying proportions.

COAL BENEFICIATION, CARBONIZATION, AND BRIQUETTING

These investigations included a continuation of the physical and chemical survey of coals in Alberta; the study of coking characteristics of various Canadian coals; the manufacture of briquettes; a general investigational survey of the methods employed in the preparation of coal at western collieries; and a study of the preparation of high pressure steam-drying of Onakawana lignite.

The physical and chemical survey of bituminous coals from central Alberta and from the Crowsnest area of British Columbia was completed with the preparation of typewritten reports, 10 of which were on Alberta coals and 6 on coals from British Columbia. During July and August, new samples from collieries in the producing fields of southern Alberta were collected and tested. The publication in mimeographed form of the "Physical and Chemical Survey of Coals from Canadian Collieries" was continued with the issuing of Memorandum Series No. 78 dealing with the Cumberland County Coalfield in Nova Scotia.

A laboratory and field investigation on the coking characteristics of several Alberta and British Columbia coals was conducted to determine which coals are available and how they can be employed for the production of by-product coke in Western Canada. A thorough study was made of the application of the Curran-Knowles process of carbonization to the beneficiation of New Brunswick

coals. This included the preparation of a large amount of suitable coal by washing at the Fuel Research Laboratories and its subsequent processing in the Curran-Knowles ovens at Owen Sound, Ontario. The resultant coke was tested at the Fuel Research Laboratories for its suitability as a domestic fuel.

Coal preparation-plants, including washeries in Western Canada, were inspected and data on their operation were collected. Interest in briquetting was renewed with the introduction into Western Canada of a high-pressure process of binderless briquetting. A technical officer investigated two such processes being developed in Illinois, and their possible application to Canadian coals. The briquetting plants at Canmore and Brazeau, Alberta, were also visited, and after examination of their respective briquetting products, suggestions were made of the need of improving the physical characteristics and general burning properties of the briquettes.

High-pressure steam drying tests on Onakawana lignite from northern Ontario were conducted at the Fuel Research Laboratories, employing the equipment formerly used in hydrogenation investigations. These tests were made in co-operation with the Toronto and Northern Ontario Railway Commission to obtain fundamental information before establishing a commercial plant.

PETROLEUM OILS, NATURAL GAS, AND MINE AIR

Experimental and analytical work was conducted on crude oils and natural gas from wells in Alberta, Ontario, and other parts of Canada, and tests were made of a variety of refined oil-products submitted by other Government departments, commercial organizations, and individuals. A gasoline survey was made for the Department of Munitions and Supply at the request of the Oil Controller.

The mine-air analytical service, mainly for Alberta and British Columbia, was continued, its purpose being to reduce the hazards from explosion or asphyxiation in the mines. The analysis of samples of natural gas collected previously in southwestern Ontario was continued, and other gas analyses were made of samples from investigational projects.

TURNER VALLEY PETROLEUM INVESTIGATION

The research work begun in the previous fiscal year with the object of improving the gasoline from Turner Valley crude oil and of producing toluene was continued. It was found possible by catalytic reforming to increase substantially the octane number of Turner Valley gasoline for motor and aviation use. A method was developed for producing from Turner Valley crude oil large quantities of toluene of the high degree of purity required for the production of T.N.T. (trinitrotoluene).

ROUTINE CHEMICAL LABORATORY WORK

As is shown below, 1,957 samples of solid, liquid, and gaseous fuels were analysed, the examination of which involved some 11,000 separate chemical and physical determinations of the different items of analysis. In this total are included 50 samples of peat litter from the Industrial Minerals Division, and 265 samples of mine air from the Governments of Alberta and British Columbia.

	Number of samples	Per cent of total
1. Samples pertaining to investigations of Fuels Division—		
Solid Fuels	949	48·5
Coals 795		
Cokes, chars, peat, wood, and miscellaneous 154		
Liquid Fuels	126	6·4
Gasolines and other motor fuels 116		
Crude oils, lubricating oils, and miscellaneous 10		
Gases	47	2·4
Natural gas 8		
Manufactured gas, flue gas, and miscellaneous 39		
2. Samples from other divisions of Department of Mines and Resources	65	3·3
3. Samples from other Government departments and elsewhere—		
Department of Pensions and National Health—coals	96	4·9
Department of Justice (Penitentiaries Branch)—coals	75	3·8
Department of National Defence—Militia, Air, and Naval Services—coals, lubricating oils, fuel oils, and (aviation) gasolines	131	6·7
Department of Munitions and Supply (Oil Controller) and other Dominion Government departments; mostly gasolines	40	2·1
Provincial governments, mostly mine air	292	14·9
Commercial firms, private individuals, etc	136	7·0
Total	1,957	100·0

COMMITTEES, AND FUELS DIVISION REPRESENTATIVES

National Research Council Committees

Associate Committee on Coal Classification and Analysis—Members, B. F. Haanel, R. E. Gilmore, and J. H. H. Nicolls.

Canadian Government Purchasing Standards Committee

Sub-Committee on Plans and Administration—Member, R. E. Gilmore.

Sub-Committee on Lubricants and Liquid Fuel Specifications—Member, R. E. Gilmore.

Sub-Committee on Specifications for Solid Fuels, Chairman, R. E. Gilmore, member, R. A. Strong.

National Model Building Code—Fire Protection, Health, and Sanitation Committee, members, E. S. Malloch and C. E. Baltzer.

Petroleum Sub-Committee of Advisory Board of Industrial Research Chemists—Member, T. E. Warren.

American Society for Testing Materials (A.S.T.M.)

Committee D-5 on Coal and Coke—R. E. Gilmore representing Canadian Bureau of Mines on this Committee is a member of the following sub-committees, viz.: I—Methods of Testing; VII—Pulverizing Characteristics of Coal; XIII—Coal Sampling; XV—Plasticity and Swelling of Coal; XVI—Ignitability of Coal; is Chairman of Sub-Committee XI—Coal Friability, and Vice-Chairman of Sub-Committee XV—Classification of Coal.

EXPLOSIVES DIVISION

The Division administers Order in Council P.C. 2903 of July 4, 1940, passed under the War Measures Act for control of the possession, use, and sale of

authorized explosives, in addition to its regular duties in connection with the Explosives Act. In this work it has received active co-operation and assistance from the Royal Canadian Mounted Police. The administration of P.C. 2903 and other responsibilities undertaken in consequence of the war have so increased the work that it has been necessary to curtail the regular peacetime services. Little field inspection work was carried out, except in connection with the construction and operation of new factories engaged in the manufacture of military explosives. The chemical staff carried out the routine check analyses of commercial explosives and conducted physical tests, and made analyses of other explosive materials submitted by various organizations.

EQUIPMENT

Arrangements were made in conjunction with the National Research Council for the erection of new testing and research laboratories on a convenient site outside Ottawa. The accommodation to be provided will consist of chemical and physical testing laboratories. Separate buildings are to be provided where the nature of the work requires segregation. Some of the new equipment was on hand at the end of the fiscal year.

FACTORIES

The production of commercial explosives again showed a slight increase, and the number of factories engaged in their manufacture remained the same as in the previous year.

Inspectors of the Division made 42 visits to factories, and held several consultations with officials concerning the design of new plants.

ACCIDENTS

An investigation was made of an explosion in a black powder press in a commercial factory which caused the death of the operator, but it was impossible to determine the cause. While charging Roman candles in a fireworks factory a man was burned when the charge on which he was working flashed. He was confined to a hospital for 2 weeks.

A total of 79 accidents caused by the use or handling of explosives were recorded. These resulted in the death of 23 people and 88 were injured. Playing with detonators and other explosives caused one death and injuries to 27. All but a few of the injured were children.

MAGAZINES

Many of the larger distributing magazines were closed owing to the restrictions imposed by the War Measures Act and those now operating are all under close supervision. Several new licences were issued permitting the storage for resale of very small quantities of explosives. At the end of the year, 324 permanent and 306 temporary magazine licences were in effect.

MISCELLANEOUS

There were 18 prosecutions that involved explosives. Of these 4 were laid under the Explosives Act, 9 under P.C. 2903, and 5 under the criminal code. These resulted in 16 convictions and appropriate penalties were imposed.

Close to 5 tons of deteriorated explosives were destroyed, as well as 8,900 detonators, some fuse, and odd lots of nitroglycerine taken from burglars.

DOMINION FUEL BOARD

The Dominion Fuel Board is a division of the Mines and Geology Branch and its six members are drawn from the staff of the Department of Mines and Resources. The Board administers the funds provided to aid the Canadian coal and coke industry under various Orders in Council and the Domestic Fuel

Act (1927). It also acts in an advisory capacity to the Cabinet sub-committee on fuel and co-operates closely with the Coal Administrator, the Secretary of the Board being Technical Adviser to the Coal Administrator.

During the year, the war was responsible for marked changes in the coal industry of Canada. Anthracite, which prior to the war was imported from six or seven different countries, was imported only from Great Britain and the United States. A shortage was experienced of about 25 per cent in the small sizes of a type suitable for use in blower systems. These were types which formerly were shipped from Europe and French Indo-China in considerable quantity. Nevertheless, total importations of anthracite were approximately 5 per cent above those of the previous fiscal year, more British anthracite being imported than in either of the 2 preceding years.

The growing demands of industries, railways, and muntions' plants resulted in a further increase in production from Canadian mines, production in 1940-41 being approximately 7 per cent above that of 1939-40 and 27 per cent above the output of 1938-39. Imports of bituminous coal—almost all from the United States—increased by 37 per cent compared with 1939-40, and were 41 per cent above the imports of 1938-39.

The subvention policy, initiated in 1928, under which movements of Canadian coal are granted assistance up to certain limits to enable it to compete with imported coal in consuming markets was continued. Except for temporary adjustments in some rates of assistance to a few points in Eastern Canada where the assistance provided was out of line with the actual competition, no changes were made in the subvention rates.

Owing to a shortage of shipping on the St. Lawrence due to war demands, it was not possible to bring as much Maritime coal as usual by water to St. Lawrence depots. Less coal was thus available for shipment by rail and water under assistance to points of consumption in Ontario and Quebec. Though this decline was offset to some extent by larger movements of western coals to Ontario and all-rail movements from the Maritimes, the total movement of coal under assisted rates was 2,920,328 tons at a cost of $4,354,576, compared with 3,645,725 tons at a cost of $4,476,916 in 1939-40. The average cost per ton increased from $1.23 in 1939-40 to $1.49 in 1940-41, due largely to the higher average rates of assistance paid on the larger movements of western coal and to the heavy all-rail movement from the Maritimes.

This all-rail movement from Nova Scotia to Ontario and Quebec amounted to approximately 891,800 net tons at a cost of $1,314,000 and compared with a 263,300-ton rail movement in 1939-40 at a cost of $335,200 for assistance.

The increase in the movement of western coal to Ontario is equally striking. Approximately 852,700 net tons were shipped from western mines under assistance to points chiefly in Ontario, at a cost to the Government of $1,640,000. This compares with 678,370 net tons at a cost of $965,048 in 1939-40 and 508,429 net tons at a cost of $488,003 in 1938-39. The increase is due to extended use of Alberta domestic coals throughout Ontario and especially in the northern mining areas; to increased takings of Alberta and British Columbia Crownsnest area coal for railway use in western Ontario; and to the use of western bituminous coal to replace imported coal for many of the pulp and paper, milling and mining industries in northern and western Ontario.

The extension of these movements has been influenced by the exchange situation and war taxation. In addition to the duty on coal imported from the United States, exchange at 11 per cent is now necessary on the value of the coal at the mine and freight to the border or lake port. The war exchange tax of 10 per cent is also applicable. These two factors, plus the duty and the assistance provided by the Government, enable western Canadian coals to compete with imported coals at many points in western and northern Ontario.

In conjunction with the Coal Administrator, close touch was maintained with the authorities in Great Britain and the United States to ensure the continuance of adequate shipments of anthracite, bituminous coal, and coke to fill domestic requirements and the extended industrial needs in excess of Canadian production.

The Secretary visited the chief producing districts on several occasions to obtain first-hand information and to assist in the solving of problems affecting the industry.

The usual annual survey of operating costs and revenues of Canadian coal mining districts was made, but, on grounds of economy, publication of the results in graph form was postponed to the following year, the essential data being distributed in printed form.

Coke plants operating under the Domestic Fuel Act (1927) at Halifax, Quebec, and Vancouver were inspected and the summary of operations of all Canadian coke plants was brought up to date.

The Board's Resident Inspector at Winnipeg was employed in checking coal distribution and in carrying out special investigations for the Board and the Coal Administrator.

The work of the Board continued to be facilitated by the co-operation of Provincial and Dominion Government departments and the industry. The Mines Department of Great Britain and the Bureau of Mines at Washington, D.C., have also been most helpful.

PUBLICATIONS

Mines and Geology Branch

English Publications

Report No.

Annual Report for the Fiscal Year Ended March 31, 1940.

French Translations

Rapport annuel sur l'année financière se terminant le 31 mars 1939.
Rapport annuel sur l'année financière se terminant le 31 mars 1940.

Bureau of Geology and Topography

English Publications

2453 Memoir 221. *Geology of the Southern Alberta Plains*—by L. S. Russell and R. W. Landes.

Separate of Memoir 221. *Geology of the Southern Alberta Plains*—by L. S. Russell and R. W. Landes.

2454 Memoir 222. *Malartic Area, Quebec*—by H. C. Gunning and J. W. Ambrose.

2455 Memoir 223. *Mineral Resources, Hazelton and Smithers Areas, Cassiar and Coast Districts, B.C.*—by E. D. Kindle.

2456 Memoir 224. *Palæozoic Geology of the Toronto-Hamilton Area, Ont.*—by J. F. Caley.

2457 Memoir 225. *The Pictou Coalfield, N.S.*—by W. A. Bell.

40–1 *Jumpingpound, Alberta*—by G. S. Hume. (Map only.)

40–2 *Wildcat Hills Map-area, East Half, Alta.*—by C. O. Hage.

40–3 *Michwacho Lake, Abitibi Territory, Que.*—by H. H. Beach (Map only.)

40–4 *Mechamego Lake, Abitibi Territory, Que.*—by H. H. Beach. (Map only.)

40–5 *Fish Creek, Alta.*—by G. S. Hume. (Map only.)

40–6 *Bragg Creek, Alta.*—by G. S. Hume and H. H. Beach. (Map only.)

40–7 *Gordon Lake South, N.W.T.*—by J. F. Henderson. (Map only.)

40–8 *The Structure and Oil Prospects of the Foothills of Alberta between Highwood and Bow Rivers*—by G. S. Hume.

40–9 *Gordon Lake, N.W.T.*—by J. F. Henderson. (Map only.)

40–10 *Stony Rapids and Porcupine River Areas, Sask.*—by G. M. Furnival.

Report No.

40–11 *The Lloydminster Gas and Oil Area, Alta. and Sask.*—by G. S. Hume and C. O. Hage.

40–12 *Zeballos Mining District and Vicinity, B.C.*—by M. F. Bancroft.

40–13 *Wapiabi Creek, Alta.*—by B. R. MacKay. (Map only.)

40–14 *Quyta Lake and Parts of Fishing Lake and Prosperous Lake Areas, N.W.T.*—by A. W. Jolliffe.

40–15 *Grave Flats, Alta.*—by B. R. MacKay. (Map only.)

40–16 *Pembina Forks, Alta.*—by B. R. MacKay. (Map only.)

40–17 *George Creek, Alta.*—by B. R. MacKay. (Map only.)

40–19 *Bearberry, Alta.*—by H. H. Beach. (Map only.)

40–20 *Assinica Lake, Que.*—by G. Shaw. (Map only.)

40–21 *Mishagomish Lake, Que.*—by G. Shaw. (Map only.)

Mimeographed Report

40–22 *Natural Gas in Brantford Area, Ont.*—by J. F. Caley.

NATIONAL MUSEUM OF CANADA

English Publications

Bulletin 92. *Botany of the Canadian Eastern Arctic—Part I, Pteridophyta and Spermatophyta*—by N. Polunin.

Bulletin 96. *A Biological Investigation of the Thelon Game Sanctuary*—by C. H. D. Clarke.

French Translations

Feuillet No 6. *Les Tribus de la Côte du Pacifique.*

Feuillet No 7. *Les Indiens des Cordillères.*

BUREAU OF MINES

English Publications

Separates 762-771 (Investigations in Ore Dressing and Metallurgy, January-June, 1939).

Separates 772-774 (Investigations in Ore Dressing and Metallurgy, January-June, 1939).

Separates 775-782 (Investigations in Ore Dressing and Metallurgy, July-December, 1939).

Separates 783 and 784 (Investigations in Ore Dressing and Metallurgy, July-December, 1939).

Separates 785-787 (Investigations in Ore Dressing and Metallurgy, July-December, 1939).

797 *Combined Report of Investigations in Ore Dressing and Metallurgy, July-December, 1938.*

800 *Stabilized Roads*—by R. H. Picher.

802 *Comparative Tests of Various Fuels when burned in a Domestic Hot-Water Boiler, 1935-1938*—by C. E. Baltzer and E. S. Malloch.

803 *Talc, Steatite, and Soapstone; Pyrophyllite*—by H. S. Spence.

805 *Combined Report of Investigations in Ore Dressing and Metallurgy, January-June, 1939.*

Petroleum Fuels in Canada, 1939—by J. M. Casey (folder).

French Translation

801 *La Stabilisation des Routes*—par R. H. Picher.

MIMEOGRAPHED REPORTS

English

Report No.

77 *Industrial Waters in Canada, Interim Report No. 5*—by H. A. Leverin.

78 *Physical and Chemical survey of coals from Canadian Collieries-Nova Scotia-Cumberland County Coalfield.*

Report No.

79 *Physical and Chemical survey of coals from Canadian Collieries-Nova Scotia-Pictou County Coalfield.*

80 *Peat Moss Deposits in Eastern Canada. A survey of areas offering industrial possibilities*—by H. A. Leverin.

EXPLOSIVES DIVISION

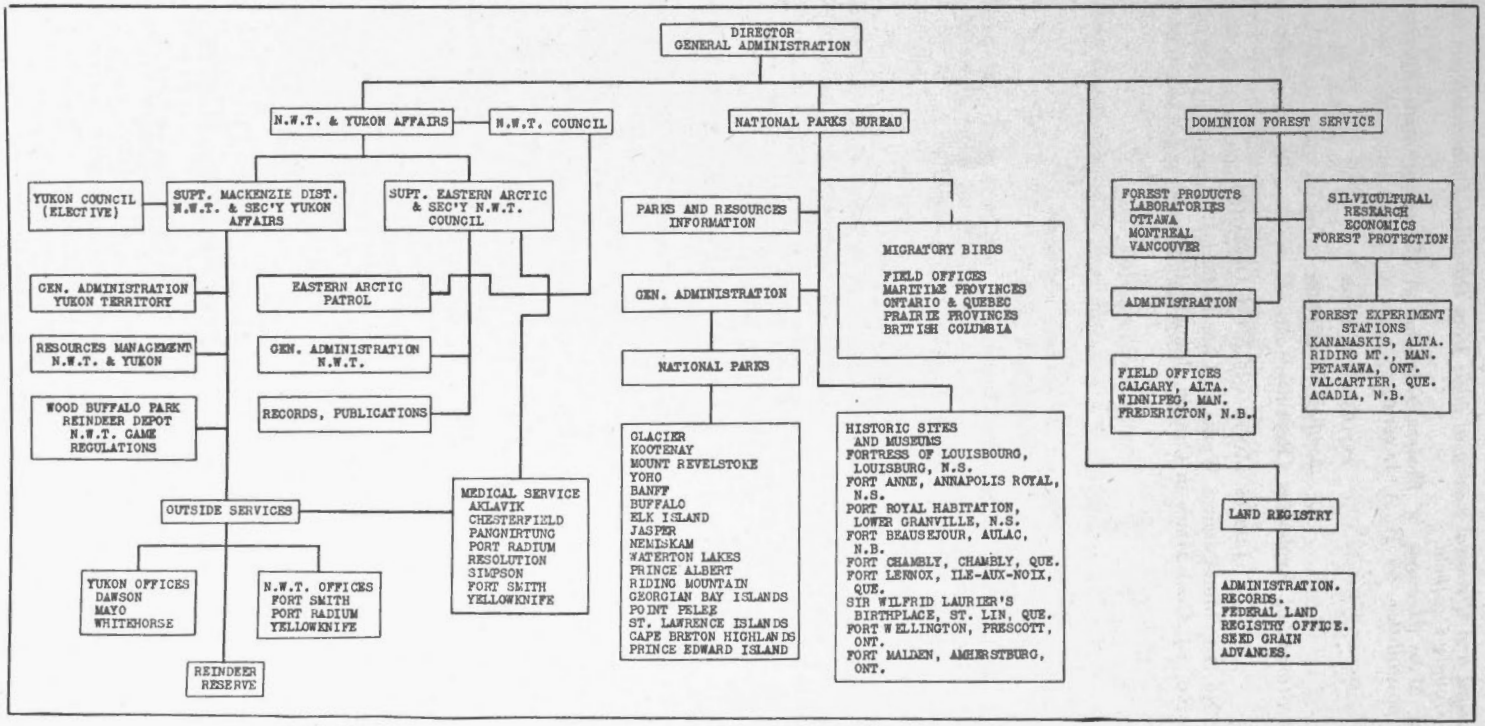
English Publication

The Storage of Explosives (Reprint).

LIST OF MINES AND MINE OPERATORS

List No. 1-1, Metallurgical Works in Canada Part I.

List No. 4-1, Coal Mines in Canada, January 1941.



Organization Chart, Lands, Parks and Forests Branch.

LANDS, PARKS AND FORESTS BRANCH

ROY A. GIBSON, DIRECTOR

During the year the Branch has carried on all essential services and in addition has undertaken various activities that have developed as a result of the war. Only a limited amount of information can be published at present about some of these wartime duties. Many of the permanent, temporary, and seasonal employees of the Branch have enlisted for military service and others have been loaned temporarily to war departments. Owing to these enlistments, loans, and to a number of retirements for the sake of economy, the remaining members of the staff have taken on additional work and responsibility.

Gold production has increased markedly in the Northwest Territories and as a result fur is no longer the commodity of greatest export value. Four properties are now producing gold and further developments are going ahead on other properties.

Gold production in the Yukon Territory is now better organized for steady production over a term of years. The situation with respect to the development of silver-lead deposits is not so promising.

The National Parks report the largest attendance of visitors in their history and the proportion of those coming from the United States is very gratifying. These national playgrounds are a very important factor in attracting visitors from the United States. This is particularly true of the western provinces. Expenditures by United States tourists in this country are an important source of funds for foreign exchange. Not much new work was initiated in the parks, but several developments under way were brought to completion. Several of the Forest Experiment Stations have been used as internment camps and, where possible, the service of the internees have been utilized to make permanent improvements to the roads, camp-grounds, forestry plots, and timber stands. The Forest Products Laboratories rendered essential technical services to the Defence Departments and to the wood-using industries. The Dominion Forest Service worked throughout the year in close collaboration with the office of the Timber Controller.

Care has been taken to conserve the very considerable investment of the Dominion in the various properties administered by the Branch.

It is the consistent policy to seek technical assistance in natural resources administration from other Government departments that are organized to supply same and acknowledgment is made of the ready and efficient co-operation that is secured. Mention should be made also of the assistance furnished by the Royal Canadian Mounted Police in the administration of remote territories.

The accompanying chart shows the plan of operation of the four main bureaux or services. The various activities carried on during the past year, which extend to every part of the Dominion, are outlined more fully in the report that follows.

BUREAU OF NORTHWEST TERRITORIES AND YUKON AFFAIRS

NORTHWEST TERRITORIES

The Northwest Territories comprise that portion of the mainland of Canada lying north of the Provinces of Manitoba, Saskatchewan, and Alberta, and east of Yukon Territory, the islands in Hudson and James Bays and in Hudson Strait, including Ungava Bay and the vast Arctic Archipelago. The estimated total of land and fresh-water areas of the Northwest Territories is 1,309,682

square miles. According to the official census of 1931 the population of the Northwest Territories totalled 9,723,' classified as follows: Indians, 4,046; Eskimos, 4,670; and white inhabitants, 1,007. However, owing to the mining activity that has developed in the Mackenzie District during recent years, the white population has considerably increased, the estimated total being 2,000.

The Northwest Territories Act (Chapter 142, R.S.C. 1927) provides for a Territorial Government composed of the Commissioner of the Northwest Territories, the Deputy Commissioner, and five Councillors, all appointed by the Governor General in Council. The Commissioner in Council has power to make ordinances for the government of the Territories under instructions from the Governor General in Council or the Minister of Mines and Resources, respecting direct taxation within the Territories in order to raise revenue, etc., establishment and tenure of territorial offices and the appointment and payment of officers, maintenance of prisons, municipal institutions, licences, solemnization of marriages, property and civil rights, administration of justice, and generally all matters of a local or private nature in the Territories. The seat of Government is at Ottawa.

Council

Commissioner—Charles Camsell.
Deputy Commissioner—R. A. Gibson.
Members of Council—A. L. Cumming, K. R. Daly, H. W. McGill, O. D. Skelton (deceased), S. T. Wood, H. L. Keenleyside.
Secretary—D. L. McKeand.

Work of Council

Eighteen regular and three special sessions of Council were held during the year. Assent was given to ordinances respecting the adoption of infants and the operation of motor vehicles on highways. Amendments were approved to the Workmen's Compensation; Local Administrative District; Businesses, Callings, Trades and Occupations Licence, and Territorial Liquor Ordinances.

Matters dealt with by Council included: organization and itinerary of Eastern Arctic Patrol; application for permit under Scientists and Explorers Ordinance; Eskimo affairs; relief; hunting and trapping; hospital and medical services; reindeer; radio services; schools, and public works.

Administration

The administration of the various acts, ordinances, and regulations pertaining to the Northwest Territories is supervised by the Director of Lands, Parks and Forests Branch, who is also Deputy Commissioner of the Northwest Territories. For purposes of departmental administration a superintendent has been appointed for the Eastern Arctic and one for Mackenzie District. A departmental agent is stationed at Fort Smith, the first settlement reached by those entering the Mackenzie District by the water route from the south. This officer is also Superintendent of Wood Buffalo National Park, Dominion Lands Agent, Crown Timber Agent, and Mining Recorder, as well as Stipendiary Magistrate and Sheriff.

In view of the development in mining activity in the area north of Great Slave Lake it was necessary to have the office of record for that area located more conveniently to the scene of operations and, therefore, in July 1940, the Sub-mining Recorder at Yellowknife was created Mining Recorder, Agent of Dominion Lands, and Crown Timber Agent for the Yellowknife Mining District, which includes the area formerly constituting the Great Bear Lake Mining District, in which prospecting activity has declined.

Medical Officers

To facilitate medical administration, the Northwest Territories has been divided into medical districts over which Medical Officers of the Department have jurisdiction. These officials are stationed at Fort Smith, Resolution, Simpson, Norman, Aklavik, Yellowknife, Chesterfield, and Pangnirtung. A doctor also accompanies the annual Eastern Arctic Expedition. Owing to the temporary suspension of mining activities by Eldorado Gold Mines, Limited, Great Bear Lake medical district has been included in that of Norman. All doctors have been appointed Coroners and Medical Health Officers under the Public Health Ordinance in order to enforce sanitary and general health regulations. The Medical Officers also have jurisdiction over all hospitals, schools, and Industrial Homes.

Hospitals

A new hospital was opened by the Roman Catholic Mission at Rae. This brings to ten the number of such institutions in operation within the Territories, exclusive of those operated by the mining companies. The regular or public hospitals are operated by the Anglican and Roman Catholic Missions at Fort Smith, Resolution, Hay River, Simpson, Norman, Aklavik (2), Rae, Chesterfield, and Pangnirtung.

The Department has an arrangement with the Missions to treat all indigent whites, Eskimos, and half-breeds at $2.50 per diem. During the year payment to the hospitals totalled $26,889.66 representing 10,755 days' treatment and the maintenance of one chronic invalid on the basis of $200 per annum. This figure does not include payment for special cases for whom separate accounts were rendered. During the year 11 mental and other patients were maintained in provincial institutions at a cost of $4,598.70.

Industrial Homes are operated in conjunction with the hospitals at Chesterfield and Pangnirtung where the aged and infirm are maintained and taught native handicrafts on the basis of $200 per annum. During the year the sum of $2,842.50 was expended under this heading.

The above figures do not include the amounts paid by the Indian Affairs Branch for the care and treatment of Indians.

Schools

Four residential schools are maintained by the Roman Catholic and Anglican Missions at Resolution, Providence, and Aklavik. During the year an average of 122 destitute white, Eskimo, and half-breed children were maintained in these residential schools at a cost of $21,421.99. The Missions also operate day schools within the principal settlements and in addition public schools are operated at Fort Smith and Resolution. During the year 100 pupils attended the day schools and grants totalling $2,250 were paid toward the maintenance of these institutions exclusive of a small amount for school supplies.

The above figures do not include amounts paid by the Indian Affairs Branch for the maintenance and education of Indian children.

Transportation

The Northwest Territories are reached by steamer via the Pacific and Atlantic Oceans and by the inland water routes. The aeroplane also plays a very important part in year-round transportation. Scheduled flights are maintained throughout the year, except for a short time during the freeze-up and break-up periods. The Grimshaw-Great Slave Lake winter tractor road is also providing a further means of access.

Communications

The Northwest Territories and Yukon radio system was again operated by the Department of National Defence (Permanent Force). Wireless stations were operated by the Department of Transport. The stations of the former are located at Edmonton, McMurray, and Chipewyan, Alberta; Goldfields, Saskatchewan; Fort Smith, Resolution, Yellowknife, Simpson, Norman, Aklavik, Port Radium (closed July, 1940), and Thompson Lake, Northwest Territories; Dawson, Mayo, Whitehorse, and Burwash Landing, Yukon Territory. The wireless, meteorological, and direction-finding stations operated by the Department of Transport are located at Coppermine, Chesterfield, and Nottingham and Resolution Islands, N.W.T.; Churchill, Manitoba; Port Harrison and Cape Hopes Advance (seasonal), Quebec. Mail for the Mackenzie District and Western Arctic is carried under contract by an air transportation company. The greater portion of the mail consigned to points in the Eastern Arctic is conveyed by the R.M.S. *Nascopie*. The mail service is further supplemented by non-scheduled patrols by the Royal Canadian Mounted Police, missionaries, and other travellers.

Law and Order

Law and order in the Territories are maintained by the Royal Canadian Mounted Police. Detachments have been established at the more important settlements and extensive patrols are made to outlying areas. To facilitate the administration of justice five Stipendiary Magistrates have been appointed.

Liquor Permits

The Territorial Liquor Ordinance assented to April 27, 1939, with amendments, represents the present basis for the sale of spirituous liquor, wine, and beer in the Northwest Territories. The Saskatchewan Liquor Board, as Territorial Liquor Agent, opened a liquor store at Yellowknife on June 27, 1939, from which liquor is sold under permits issued at the store to eligible persons. Under the arrangements with the Saskatchewan Liquor Board all supplies for the Yellowknife store are provided by the Board on a percentage basis. The net profits arising out of the operation of the liquor store and the proceeds of fines under the Territorial Liquor Ordinance are placed in a special account for territorial purposes. The stipendiary magistrate, Yellowknife, is inspector of the liquor store.

The net profits from the liquor store during the fiscal year ended March 31, 1941, amounted to $31,189.92 and fines under the Territorial Liquor Ordinance to $490, making a total of $31,679.92. Other revenue derived from liquor control amounted to $382, being $82 from the sale of permits issued at Ottawa, and $300 from fines for liquor offences under the Northwest Territories Act.

The principal development during the year was the granting of authority for the sale of beer in licensed premises at the Yellowknife Hotel from August 1, 1940.

During the calendar year 1940, 64 permits were issued at Ottawa, authorizing the importation into the Northwest Territories of 79 gallons of spirituous liquor, 10 gallons of wine, and 6 barrels of beer. A total of 1,162 permits was issued at Yellowknife for the purchase of liquor at the Territorial liquor store. The sales at the store during the calendar year were spirituous liquor 2,346 gallons, wine 378 gallons, and beer 8,944 cartons.

Aids to Navigation

This work was carried out for the Department of Transport under the direction of the departmental agent. Existing aids were maintained at points on the Mackenzie River between the delta of Athabaska River and Great Bear Lake.

Lands and Timber

Lots are disposed of by sale in some of the surveyed settlements to transportation companies, mining companies, traders, and missions in connection with their several undertakings and to settlers for residential purposes. In other surveyed settlements, such as Yellowknife, surface leases are granted for the same purpose. One lot was sold and patented in Good Hope Settlement and one lot in Fort Smith Settlement was covered by a time sale. At Port Radium Settlement, 13 surface leases are in force and at Yellowknife Settlement, 148 such leases have been issued. These leases are for five-year periods.

Small parcels of unsurveyed land suitable for agricultural and fur-farming purposes, as well as tracts with water frontage suitable for transportation and shipping interests, are leased under the provisions of Chapter 113, R.S.C. 1927. The number of such leases in force is 25. Eighteen permits to occupy land during the pleasure of the Department have been granted. There are 5 grazing leases in force, and during the year 6 hay permits were issued under which 78 tons of hay were cut. During the year 26 assignments affecting lands were registered in the Department.

The number of timber permits issued, exclusive of those granted in connection with timber berths, was 103 authorizing the cutting of 82,079 lineal feet of timber, 542 roof poles, 6,000 mine ties, and 3,856 cords of wood. Thirty-seven of these permits were issued free of dues to educational, religious, and charitable institutions, to settlers for domestic use, and to Government departments. Thirteen timber permit berths were granted. The revenue derived from lands, timber, grazing, and hay was $11,657.50, being an increase of $4,151.23 over the previous year.

Mining

To meet the increasing activities in the Yellowknife area, a Mining Recorder's Office was opened at Yellowknife Settlement on July 5, 1940, and on the 23rd of that month the office at Port Radium was closed. Through the Yellowknife office, and the Mining Recorder's office at Fort Smith, the local administration of mineral resources of the Mackenzie District is conducted, Sub-Recorders being located at Edmonton, Alberta, and at Aklavik, Simpson, and Coppermine, Northwest Territories.

The "Con" mine of the Consolidated Mining and Smelting Company of Canada, Limited, was brought into production in September, 1938, and by the end of March, 1941, had yielded gold to the value of more than $2,971,000, of which about $1,255,000 was produced during the year. Production at the company's "Rycon" mine was reached early in 1939 and by the end of the year under review had reached a value of about $209,000, the year's production amounting to more than $152,000. The "Negus" mine, owned by Negus Mines, Limited, commenced production in February, 1939, and reported production of gold to the end of March, 1941, having a value of more than $1,535,000. Several other properties in the area are nearing the production stage.

The Eldorado property at Great Bear Lake, on which ores of radium and silver were discovered in 1930, was closed temporarily in June, 1940, sufficient concentrates being on hand to keep the refinery at Port Hope, Ontario, in operation for several years at the present reduced rate.

Miner's licences issued during the year numbered 178, and 289 such licences were renewed. Entries were granted for 405 quartz mining claims and a large number of claims were renewed by the owners obtaining certificates of work, the number in good standing at the end of the year being 4,690. Final leases have been issued comprising an area of 10,963·89 acres. The total revenue obtained from fees payable under the Quartz Mining Regulations amounted to $17,096.85, including $6,516.65 collected as licence fees.

Coal.—Three coal mining leases are in force, comprising an area of 391 acres. Revenue from fees, rentals, and royalties in connection with coal mining rights during the year amounted to $373.21.

Petroleum and Natural Gas.—Petroleum and natural gas leases affecting lands in the Northwest Territories comprise a total area of 3,173·33 acres. Revenue from this source amounted to $480. Rentals satisfied from drilling credits totalled $1,253.33. Petroleum produced from the wells of the Northwest Company, Limited, below Norman on Mackenzie River, amounted to 17,949 barrels. The refinery unit erected on the company's property continued to operate and produced during the year aviation gasoline, aviation base gasoline, motor gasoline, and light and heavy diesel oil. The addition of this unit resulted in a substantial reduction in the price of gasoline and fuel oil. One oil and gas permit is in force, comprising an area of 212·10 acres.

Dredging.—Two dredging leases are in force in the Northwest Territories, comprising in all 2 five-mile stretches of Grizzly and Bennett Creeks. Revenue from these leases for the year amounted to $140.

Northwest Game Act and Regulations

During the fiscal year the following legislation was enacted:—

P.C. 2490, June 11, 1940, safeguarded the privileges of hunters and trappers in the Northwest Territories by providing that, in the event of their enlistment in the British or Allied Forces, the requirement of continued residence in the Northwest Territories would be suspended until 6 months after their discharge.

P.C. 3879, August 13, 1940, established a closed season until further notice on the trapping of beaver on approximately 14,000 square miles including and surrounding the delta of the Mackenzie River.

P.C. 6484, November 14, 1940, limited the annual catch of marten in the Northwest Territories and Wood Buffalo Park to two (2) in the southern section and Wood Buffalo Park, and twenty (20) in other sections of the Territories. This limit is to be enforced by an individual permit system and to be effective from July 1, 1941.

P.C. 681, January 29, 1941, established Boatswain Bay, on the east coast of James Bay, as a Migratory Bird Sanctuary.

P.C. 1477, March 3, 1941, established the eastern part of Akimiski Island and adjacent islands and waters as a Migratory Bird Sanctuary.

The total area included in reserves established for the protection of the wild life in the Northwest Territories as at March 31, 1940, was 609,877 square miles. This does not include the 13,675 square miles of the Wood Buffalo Park situated in the Province of Alberta.

Wood Buffalo Park.—Regular patrols were maintained by the wardens to determine the range and condition of the buffalo and to ensure their protection and well-being. As is customary each year during November and December, 30 bulls were slaughtered to provide meat for the hospitals, missions, and needy native families in districts adjoining the park. Predator control was maintained to reduce the number of wolves and coyotes which prey on the herds. As a result of flood pressure and ice backing up against it from below during the high water at the time of the spring break-up on the Slave River, the Murdock Dam, constructed in connection with the fur conservation projects in the park, was severely damaged in April, 1940, necessitating additional construction and extensive repairs. These were completed during the summer. The other three dams required some minor repairs but otherwise are apparently satisfactory.

Fur and Game.—Catches of all species of fur-bearers, with the exception of white, blue, and silver foxes, and wolves showed increases during the year. Of these only the reduced number of white fox is of major importance. This species is economically the most important fur-bearer in the Territories and

the reduction from 43,290 in 1939 to 30,215 in 1940 resulted in a considerable loss of revenue to the population. Reports on caribou migrations indicate that in most districts these animals were present in sufficient numbers to meet food requirements of the residents.

The Northwest Territories Game Act and Regulations provide for the establishment and licensing of fur farms but, as is natural in a sparsely populated region where fur-bearers are plentiful in the wild state, the industry has not developed to any extent. At the present time only 8 fur farms are licensed to operate and 2 of these have no stock of fur-bearers. Of the remaining 6, one, established in 1932 and the oldest existing farm in the Territories, is stocked with a considerable number of mink, red and cross fox, and a marten. Three others have a small number of mink or fox. The remaining two are not fur farms in the true sense since there is no attempt to enclose the animals or regulate the breeding. These are the two beaver preserves of the Hudson's Bay Company, operated on Charlton and Akimiski Islands in James Bay. At the commencement of the winter of 1939-40 the beaver were estimated to number 1,020 and trapping was permitted. Two hundred and ninety-eight beaver were pelted and twelve taken alive for release on other preserves. The following spring the beaver population was estimated at 1,214. The Charlton Island Preserve comprises some 90 square miles and it is estimated it will support approximately 2,000 beaver. As a result of the presence of the beaver water levels have risen and there has been an increase in the muskrat population. Akimiski Island is about 900 square miles in area and is considered capable of supporting a beaver population of 10,000 or more. Between 1935 and 1940, 51 beaver from the Charlton Island Preserve were released along the south shore.

Comparative figures of the number of big game animals and birds taken during the licence year ended June 30, 1940, and the average for the 5 years ended June 30, 1939, follow:—

	Year ended June 30		5-year average 1935-39
	1940[2]	1939[1]	
Deer	63	20	29
Caribou	22,151	22,982	11,828
Moose	1,066	1,141	816
Sheep	86	38	53
Partridge	4,053	801	647
Grouse	909	242	185
Prairie Chicken	1,594	2,355	953
Ptarmigan	7,100	7,879	4,977
Ducks	12,956	11,777	7,115
Geese	1,008	911	700

Licences, Permits and Revenue.—Comparative statement of licences and permits issued and revenue derived under the Northwest Game Act:—

Licences

	Year ended June 30		5-year average 1936–40
	1941	1940	
Hunting and Trapping—			
Resident	488	534	496
Non-resident bird licence	20	16	11
Trading and Trafficking—			
Resident	103	124	136
Non-resident British	8	6	7

Permits

	Year ended June 30		5-year average 1936–40
	1941[2]	1940[1]	
To establish trading posts	12	28	27
To take mammals	4	5	2
To hunt and trap in Wood Buffalo Park	333	335	375
To render Migratory Birds Permits operative in N.W.T.	12	12	15
To take specimens	7	13	11
To take quota (15) of beaver	885	1,535	1,410

[1] These figures differ slightly from those recorded in the annual report for 1939-40 due to additional returns received since that report was printed.

[2] Subject to revision upward as additional returns are received.

Revenue under Northwest Game Act for fiscal years ended March 31, 1940 and 1941:—

	Fiscal Year		5-year average 1936–40
	1941	1940	
	$ cts.	$ cts.	$ cts.
Hunting licences	1,153 84	1,313 92	1,762 01
Trading licences	1,899 90	2,775 00	1,972 83
Bird licences	100 00	80 00	41 00
Fur farm licences	23 07	26 00	23 20
Trading Post permits	12 00	28 00	35 85
Sale of furs	454 32	436 78	418 01
Fur export tax	75,819 16	95,848 10	84,868 09
Fines and forfeitures	1,502 64	1,156 17	345 23
Sub-totals	80,964 93	101,663 97	
Revenue under Businesses, Callings, Trades and Occupations Licence Ordinance	4,599 50	4,465 00	
Totals	85,564 43	106,128 97	

Infractions of Game Laws.—There were 28 prosecutions for infraction of the game laws. Convictions were secured in 24 of these cases.

Reindeer

Further progress is reported in the development and extension of the Government reindeer enterprise in the northern Mackenzie District. The annual roundup of the main herd on the reserve near the Mackenzie Delta was completed on July 28, 1940, and the count showed the surviving fawn increase for the year to be 1,486 head. In addition to the fawns there were 2,295 females, 610 males, and 685 steers, a total of 5,076 animals. At the roundup of Native Herd No. 1 near Anderson River in August, 1940, there were 1,559 deer, including 448 fawns.

The annual slaughter of surplus reindeer in the main herd took place on Richards Island in September and on the mainland about the end of November, the total number of animals slaughtered on these occasions being 179, of which 100 carcasses were allotted to the local missions. The total number of reindeer from this herd slaughtered for meat purposes during the fiscal year was about 230, of these 24½ carcasses were sold, from which a revenue of $574.15 was derived.

In December, 1940, a second native herd was started by the separation of between eight and nine hundred animals from the main herd and the transfer of the new herd to a location selected near Horton River, the drive of about 250 miles being accomplished in 12 days.

The General Foreman in his report on field activities during the year indicated that the reindeer were in excellent condition with abundant feed available on both the summer and winter ranges.

The Interdepartmental Reindeer Committee held two meetings.

Eastern Arctic Patrol

The annual Eastern Arctic Patrol sailed from Montreal on the R.M.S. *Nascopie* of the Hudson's Bay Company on July 17. On the homeward voyage a call was made at Ivigtut, Greenland, where a cargo of cryolite was taken aboard. The vessel docked at Port Alfred, Quebec, on October 14, and the personnel of the Patrol returned to Ottawa by train.

D. L. McKeand was again the Officer in Charge of the Government party, which included F. R. E. Sparks, Post Office Department, and Max J. Dunbar, Marine Biologist, Oxford University. Inspector D. J. Martin was in charge of the Royal Canadian Mounted Police party. Doctors M. O. Klotz, J. A. Bildfell, and T. J. Orford acted in turn as Medical Officer and Ship's Doctor.

In view of the state of emergency it was decided to forward as nearly as possible a two-year supply for each of the posts serviced by the *Nascopie* with the result that 667½ tons of Government freight were carried this year. D. L. McKeand, having been appointed Registrar for National Registration in the Eastern Arctic, performed this work with the co-operation of the Royal Canadian Mounted Police, missionaries, and fur traders. The Officer in Charge reported that while there was a scarcity of white fox, the principal fur-bearer trapped in this region; other animals were plentiful and the natives generally were well supplied with food. The Medical Officers reported the general health of the natives at the various ports of call to be satisfactory.

Yellowknife Administrative District

This District, covering an area of 38·48 square miles on the north arm of Great Slave Lake and about 615 miles by air from Edmonton, is managed by a Local Trustee Board of 5 members. During the year 26 Board Meetings were held and 8 By-laws were passed covering such items as health and sanitation, the assessment and collection of taxes on real and personal property, regulations governing boat lights, traffic at the local airport, the operation of motor taxis carrying passengers over the ice, and fire protection measures.

In the local school 2 teachers are maintained and the Alberta curriculum is followed. The Dominion Government makes an annual grant of $1,000 and there is an elected school board of 3 members.

Public Improvement

Winter landing fields, seaplane bases, roads, and fire-fighting equipment were maintained and some additions made to the latter.

YUKON TERRITORY

Yukon Territory has an area of 207,076 square miles. It is bounded on the south by British Columbia and Alaska; on the west by Alaska (longitude 141 degrees west); on the north by the Arctic Ocean; on the east by the Northwest Territories. Most of the Yukon's present population is found in three areas; the northern or Dawson District, the southern or Whitehorse District, and the Upper Stewart River or Mayo District. According to the

census of 1931 the total population was 4,230 (2,593 whites, 1,543 Indians, 85 Eskimos, and 9 unspecified). There has been an increase lately in the white population owing to revival of mining activities.

The Yukon was created a separate territory in June, 1898. Provision is made for a local government composed of a Chief Executive, called the Controller, also an Elective Legislative Council of three members, with a three-year tenure of office. The Controller administers Government measures and works under instructions from the Governor General in Council or the Minister of Mines and Resources. The Controller in Council has power to make ordinances dealing with the imposition of local taxes, sale of liquor, preservation of game, establishment of territorial offices, maintenance of prisons and municipal institutions, issue of licences, incorporation of companies, solemnization of marriages, property and civil rights, administration of justice, and generally all matters of a local and private nature in the Territory.

Territorial Council

Controller, Yukon Territory—G. A. Jeckell, Dawson.
Seat of Government—Dawson, Y.T.

The following is the Yukon Council elected August 27, 1937; Dawson District, John A. McDonald; Whitehorse District, George Wilson; Mayo District, Ernest J. Corp.

Work of Council

The Yukon Council met on June 3, 1940. This was the third and final session of the eleventh wholly Elective Council of the Territory. The Council was prorogued on June 15, 1940.

The Council enacted ordinances providing for the imposition and collection of a tax on income, also on gasoline and fuel oil. In addition an ordinance was passed respecting the practice of chiropractic. Amendments were made to a number of other ordinances.

Election

The triennial election to Council was held on November 25, 1940, the following being elected; Dawson District, Andrew T. Taddie; Whitehorse District, Willard Leroy Phelps; Mayo District, Richard Gordon Lee.

Administration

The Lands, Parks and Forests Branch is responsible for business arising from the general administration of the Territory under the Yukon Act and Ordinances passed by the Territorial Council; for the disposal of lands under the Dominion Lands Act; the administration of the Yukon Placer and Quartz Mining Acts; and for the collection of revenue.

The activities of Dominion Government Departments in the Territory involved an expenditure of $466,422.30 during the past fiscal year and the revenue collected in the Yukon amounted to $494.236.54. These figures do not include those for the Department of National Defence. For local purposes the Territorial Government raised $182,034.17, of which amount $110,000 represented the profit from the operation of Government liquor stores.

Lands and Timber

One sale was made; 1 agricultural lease, 4 hay permits, and 1 permit to occupy were granted; 6 renewal leases were issued. There are now in force 22 homestead entries, 8 agricultural leases, 24 waterfront leases, 2 miscellaneous leases, and 17 permits to occupy. The revenue derived from lands amounted to $5,784.27.

One hundred and twelve permits were issued authorizing the cutting of 306,000 feet board measure of saw timber and 19,531 cords of wood, being 4,144 cords more than last year. One permit to cut wood for mining purposes was issued free of dues. Nine licence timber berths were cancelled, leaving 24 in force for which licences were issued. Six timber seizures were made. The total revenue collected from timber was $10,543.92, being an increase of $3,747.93 over last year.

Mining

A slight decrease in placer gold production was noticeable during the year, owing mainly to the early freeze-up. Placer mining operations produced 98,138·51 ounces of gold, the total value of which, at $35 per ounce, is $3,434,847.85. Entries were granted for 171 placer and 84 quartz mining claims staked and applied for during the year and 2,949 such claims were renewed for another year. Nine quartz mining leases were issued during the year comprising in all an area of 376·39 acres, making a total of 5,310·81 acres held under lease.

Gold Royalty.—The total amount collected for royalty on gold obtained from placer deposits up to March 31, 1941, was $5,233,925.55, of which amount $36,802.34 was collected during the year.

Dredging.—Three leases to dredge for minerals in the beds of rivers in the Territory are now in force, comprising a river stretch of about 14½ miles in all. The total rental from this source up to March 31, 1941, amounted to $210,496.87, of which $290.53 was collected during the year.

Hydraulic Mining.—The regulations for the disposal of hydraulic mining locations were withdrawn by Order in Council dated February 4, 1904, but the leases then in force were not affected by such withdrawal. There are still 4 hydraulic mining locations held under lease, comprising a total area of approximately 16 square miles. Rentals amounting to $208,743.50 have been collected on account of such locations, the amount received during the year being $1,382.

Placer Mining

The total number of placer claims in good standing at the close of the year was 2,632, most of which are held by the Yukon Consolidated Gold Corporation, Limited. Ten dredges were operated by this company during the year and these produced 66,760 fine ounces of gold and 14,313 fine ounces of silver. The company employed an average of 430 men, the peak during the operating season being 759, and expended $1,993,000 for salaries, wages, and power. A further sum of $1,035,332 was expended for equipment, supplies, and freight.

The greater part of the 98,138·51 ounces of gold produced during the year was from the Dawson District, the Mayo District producing 1,938·5 ounces, and the Whitehorse District, 907·04 ounces.

Lode Mining

Dawson District.—Entries were granted for 29 quartz claims staked and applied for during the year, and development work was conducted on 116 claims previously staked.

Mayo District.—Operations in this area are conducted mainly by the Treadwell Yukon Corporation, Limited, on the "Calumet" and "Elsa" groups of mineral claims, the mill being located at the "Elsa" camp. During the year, 97·94 tons of crude ore and 4,266·94 tons of concentrates were shipped from this camp, yielding 2,277,569 ounces of silver and 245,488 pounds of lead. The average number of men employed by this corporation was 86 and the ore shipped had a value of $806,086.

Prospecting Leases

Prospecting leases representing a total stretch of 198 miles were issued during the year, comprising locations on several water courses, an increase of 42 miles as compared with the previous year.

Assay Office

The Assay Office was maintained as usual at Keno by the Territorial Government. A total of 1,029 samples of rock for assay were received from all parts of the Territory, and 1,640 assays or quantitative analyses were made. In addition, numerous qualitative determinations and chemical tests were made in connection with the identification and classification of the various rocks and minerals of which no record was kept. The assays made were gold and silver, 1,029; lead, 604; copper, 3; antimony, 2; and tungsten, 2.

Roads and Bridges

Expenditures on the maintenance of the road system out of Territorial funds were $50,050.57, a decrease of $729.37 from the previous year. Work was confined to maintenance of the roads most used. A new landing barge for the ferry used at Dawson was purchased at a cost of $3,650. All road equipment was repaired and kept in good condition. A Special Grant of $15,000 was received from the Federal Vote for mining roads, from which the sum of $11,637.59 was expended.

Development of Aircraft Landing Facilities

A total expenditure of $5,798.28 was made to maintain and improve existing landing fields. Of this amount, $2,436.31 was from Territorial Government Funds, the balance from the Federal Vote for mining roads. The most important fields, namely, at Dawson, Whitehorse, Mayo, and Carcross, were extended and improved, and work was also done on the secondary fields at Carmacks and Flat Creek. In addition to the above the White Pass and Yukon Route constructed, at its own expense, emergency landing fields at Fox Lake, Little Salmon, Yukon Crossing, and Grand Valley, all on the regular routes from Whitehorse to Mayo and Dawson.

Agriculture

The summer of 1940 was favourable for vegetable crops, and there was a marked increase in production. Hay and grain fodder crops were good, and weather conditions were favourable for cutting and curing. It is quite noticeable at the present time in the Dawson area that much more ground is being prepared for vegetable crops than in previous years.

Fur and Game

The net collections made under the Fur Export Tax Ordinance amounted to $9,389.50, an increase of $527.81. A considerable increase is shown over the previous year in beaver, marten, mink, muskrat, otter, and weasel. Coyote, all kinds of fox, lynx, and wolverine show a decrease.

The number of coyote pelts dropped from 1,080 for the previous year to 299. Wolf pelts increased from 266 to 279.

Public Welfare

The general health of the public of the Territory was good. Hospitals were operated at Dawson, Mayo, and Whitehorse, grants for their maintenance being provided by the Yukon Council. The numbers of hospital days of patients for the year were: Dawson, 13,425; Mayo, 1,716; Whitehorse, 2,010; the numbers of hospital days for indigents were: Dawson, 7,947; Mayo, 200, Whitehorse, 279.

Education

Schools were maintained during the year at Dawson, Whitehorse, Carcross, Mayo, and at the "Elsa" camp on Galena Hill. The enrolment of pupils for the year was 270 and the number of teachers employed was 10.

Law and Order

Law and order have been well maintained throughout the Territory by the Royal Canadian Mounted Police, and the local administration has received the co-operation of the police at all times.

LAND REGISTRY

The Land Registry maintains a Central Office of Record of lands under the control of the Dominion; administers Ordnance and Admiralty lands, Dominion owned public lands, certain Dominion lands on which advances have been made under the Soldier Settlement Act, and timber and grazing on Soldier Settlement charged lands and military reserves; issues Letters Patent, and, in conjunction with the different western provinces, adjusts Seed Grain, Fodder and Relief indebtedness.

Central Office of Record

It has been found that the inventory of Dominion-owned lands, maintained in the Land Registry, is each year becoming increasingly used by the other Government departments and the general public as they become aware of this convenient method of obtaining information regarding the ownership of properties. There are 5,440 parcels of land listed, showing the situation, area, and controlling department.

Ordnance and Admiralty Lands

Ordnance and Admiralty lands are those areas in the Maritime Provinces, Quebec, Ontario, and British Columbia which were acquired by the Crown because of their strategic situation. When no longer required for the purpose for which they were obtained, they are transferred to this Department to administer, and they are wherever possible, made revenue producing, usually by leasing. The administration of these lands requires investigations; appraisals surveys; searches of titles; preparation of plans, leases, and reports; and collection of rentals. To assist in economical administration much of the field inspection work has been done in late years by the officers of Soldier Settlement when in the vicinity of the property regarding which a report is required. During the year investigations were made at 5 places in Nova Scotia and New Brunswick, 8 places in Quebec, 9 in Ontario, 2 in Alberta, and 2 in British Columbia.

Surveys:—Surveys were made at Levis, and Point aux Trembles, Quebec. There were 34 leases and permits issued during the year and 18 sales effected. The revenue amounted to $39,488.30.

Public Lands

The revenue from Public lands, $14,238.86, consisted chiefly of rents and amounts received on account of purchases.

Soldier Settlement Charged Lands

The unpatented lands against which charges under Soldier Settlement Act are registered, remain vested in the Dominion. There are 183 quarter-sections of such lands comprising approximately 29,280 acres spread over the four western provinces.

Letters Patent are issued to entrants who have completed the duties in accordance with the terms of the Dominion Lands Act and who have paid their indebtedness to the Soldier Settlement of Canada. In cases where duties are completed but this indebtedness not repaid, Letters Patent are issued in the name of the Director of Soldier Settlement of Canada under the authority of the provisions of Section 27 of the Soldier Settlement Act, and the amendment of 1931.

Timber and Grazing

Grazing.—During the year 9,600 acres were covered by 5 annual grazing permits on quarantine reserves along the southern boundary of Saskatchewan and Alberta. This was an increase of 2,745 acres as compared with last year. In the summer grazing season of 1940 there were 176 cattle, 146 horses, and 255 sheep grazing on these lands. The revenue, consisting of rent, amounted to $233.10.

Timber.—Within the boundaries of the National Parks there are 11 licence timber berths, covering a total area of 65·90 square miles; 2 of these berths are in the Province of Manitoba and 9 in British Columbia. During the year licences in duplicate were prepared for these berths, and 4 assignments were registered. The revenue amounted to $6,353.68, being $2,572.18 more than the preceding year. Additional fees of $2 were collected for permit berths on Dominion lands in British Columbia.

Within this period 43 accounts, covering timber permits issued to homesteaders by the Dominion before the transfer of the natural resources, were verified for the western Provincial Governments, and letters of inquiry reaching this Administration from prospective settlers relative to the acquiring of various privileges on lands now under the jurisdiction of the Provincial Governments were placed in their proper channels. Briefly, this Administration still continues to act as the channel for settlement inquiries.

Seed Grain, Fodder, and Relief Indebtedness

The last payment in connection with advances of relief, including fodder for animals, made to settlers by the provinces under an agreement between the Dominion and the Provinces of Saskatchewan and Alberta in 1919 and renewed in subsequent years, was made in 1940, and amounted to $78,871.62.

In the year 1927, an Act 17 George V, Chapter 51, was passed, authorizing the Governor in Council to make regulations providing for apportionment and adjustment of indebtedness. During the past year 1,218 recommendations were submitted by the different seed grain, fodder, and relief adjustment boards. Their recommendations were ratified by Orders in Council. A total of 720 discharges and 418 partial discharges were issued and the amount of $120,910.77 was written off. The Provincial Governments asked for information regarding indebtedness against lands for which they proposed to issue grants in 1,748 cases and 188 certificates of indebtedness were issued to be attached to title. Statements of accounts and letters totalling 317 were sent Official Receivers, Registrars, and Boards of Review, under the Farmers' Creditors Arrangement Act in Alberta and Saskatchewan; and the various Debt Adjustment Boards and Land Utilization Boards, forwarded some 3,590 inquiries.

The gross collections for the year amounted to $15,938.75, an increase of $7,186.09. The sum of $418.33 was refunded leaving a net revenue of $15,520.40. The following summary shows the financial operations for the year ended March 31, 1941:—

——	Principal	Interest	Total
DEBITS	$ cts.	$ cts.	$ cts.
Balance outstanding, March 31, 1940	2,884,285 24	3,317,853 82	6,202,139 06
Accrued interest, April 1, 1940, to March 31, 1941	.....	169,230 91	169,230 91
Total Debits	2,884,285 24	3,487,084 73	6,371,369 97
CREDITS			
Net Revenue—April 1, 1940, to March 31, 1941	11,191 25	4,329 15	15,520 40
Amount written off—as loss by Orders in Council (Sec. 2, Chap. 51, 17 George V), and includes items written off under the Farmers' Creditors Arrangement Act, 1934	46,059 38	74,851 59	120,910 97
Amount collected and retained by Province of Saskatchewan as Commission Clause 18, Natural Resources Agreement with Province of Saskatchewan	.....	40 91	40 91
Total Credits	57,250 63	79,221 65	136,472 28

SUMMARY

Debits	2,884,285 24	3,487,084 73	6,371,369 97
Credits	57,250 63	79,221 65	136,472 28
Amount outstanding March 31, 1941	2,827,034 61	3,407,863 08	6,234,897 69

LETTERS PATENT

During the year there were 20 Letters Patent issued covering a total of 2,801 acres, divided among the Provinces of Manitoba, Saskatchewan, and Alberta, and the Yukon Territory. There were 215 certified copies of Letters Patent issued for which the Department received $590.

NATIONAL PARKS BUREAU

The National Parks are dedicated to the people of Canada for their benefit, education, and enjoyment, to be maintained and made use of, so as to leave them unimpaired for the enjoyment of future generations.

The need for recreation, or change of interest and environment, both mental and physical, is an accepted principle for a well-balanced existence. The National Parks in providing this recreation make a real contribution in maintaining the country's morale, and through the attractions they offer to visitors from the United States are a means of providing additional foreign exchange.

It can be expected that the National Parks will play an important role in the days of post-war reconstruction.

Administration

The National Parks are administered under the authority and provisions of the National Parks Act (20-21 George V. Chap. 33), sundry Provincial Agreements, and the National Parks Regulations. The Act also covers the National Historic Parks, set aside to commemorate historic events or to preserve national sites and monuments. In this phase of its work, the Bureau is advised by the Historic Sites and Monuments Board of Canada, an honorary body composed of a number of recognized historians.

In addition to the care and control of wild life within the parks, the Bureau also administers the Migratory Birds Convention Act.

Growth of National Parks

Approval of national ownership of park areas is evidenced by the substantial increase in their number and extent in little more than half a century. Instituted in 1885, when the Dominion Government set aside a scenic area of 10 square miles surrounding the hot mineral springs at Banff, Alberta, these parks now number 17, and have a total area of over 29,000 square miles. This figure does not include the National Historic Parks.

A list of the National Parks appears below, arranged in order of their establishment, together with brief descriptive notes.

1. *Banff, Alberta.*—Magnificent scenic playground in central Rockies. Noted resorts, Banff and Lake Louise. Summer and winter sports centre; golf, big game sanctuary. Established 1885; area, 2,585 square miles.

2. *Glacier, British Columbia.*—Superb alpine region in heart of Selkirk Mountains. Snow-capped peaks, glaciers, luxuriant flora. Established 1886; area, 521 square miles.

3. *Yoho, British Columbia.*—On west slope of Rockies. High peaks, beautiful lakes, Yoho and Kicking Horse Valleys. Established 1886; area, 507 square miles.

4. *Waterton Lakes, Alberta.*—Canadian section, Waterton-Glacier International Peace Park. Mountain playground with colourful peaks, varied flora and fauna; golf. Established 1895; area, 220 square miles.

5. *Jasper, Alberta.*—Immense playground and game sanctuary. Majestic peaks, ice-fields, beautiful lakes and famous resort, Jasper. Summer and winter sports; golf. Established 1907; area, 4,200 square miles.

6. *Elk Island, Alberta.*—Fenced preserve containing large herd of buffalo; also deer, elk, and moose. Recreational and camping resort; golf. Reserved 1906; established 1913; area, 51·2 square miles.

7. *St. Lawrence Islands, Ontario.*—Mainland area, and thirteen islands in "Thousand Islands" group with recreational facilities. Reserved 1904; established 1914; area, 185·6 acres.

8. *Mount Revelstoke, British Columbia.*—Rolling mountain-top plateau on west slope of the Selkirk Mountains. Accessible by motor road. Established 1914; area, 100 square miles.

9. *Point Pelee, Ontario.*—Recreational area on Lake Erie, with fine beaches and unique flora. Most southerly portion of mainland of Canada. Resting point for migratory birds. Established 1918; area, 6·04 square miles.

10. *Kootenay, British Columbia.*—Encloses Vermilion-Sinclair section of Banff-Windermere Highway in Rockies. Broad valleys, deep canyons, hot mineral springs. Established 1920; area, 587 square miles.

11. *Nemiskam, Alberta.*—Fenced preserve for prong-horned antelope. Reserved 1915; established 1922; area, 8·5 square miles.

12. *Wood Buffalo, Alberta, and N.W.T.*—Immense region of forests and open plains west of Slave River between Athabaska and Great Slave Lakes. Large herd of buffalo and other big and small game. Established 1922; area, 17,300 square miles.

13. *Prince Albert, Saskatchewan.*—Forested lakeland interlaced with numerous streams. Summer resort and recreational area; golf. Established 1927; area, 1,494 square miles.

14. *Riding Mountain, Manitoba.*—Playground and game preserve on summit of Manitoba escarpment. Summer resort and recreational area; golf. Established 1929; area, 1,148 square miles.

15. *Georgian Bay Islands, Ontario.*—Thirty islands in Georgian Bay. Unique formations on Flowerpot Island. Recreational area. Established 1929; area, 5·37 square miles.

16. *Cape Breton Highlands, Nova Scotia.*—Rugged Cape Breton Island coastline with mountain background. Fine seascapes from highway; golf. Established 1936; area, 390 square miles.

17. *Prince Edward Island.*—Strip 25 miles long on north shore of island province. Recreational area with fine beaches; golf. Established 1937; area, 7 square miles.

In addition, there is Buffalo National Park in Alberta. This was established in 1908, and has an area of 197·5 square miles. At present it is at the disposal of the Department of National Defence, and the larger mammals have been removed.

The National Historic Parks are described later under a special section.

Revenue

For the fiscal year 1940-41, the gross revenue from the National Parks and from administration of the Migratory Birds Convention Act amounted to $393,012.55 and $534.12 respectively. This compares with figures of $390,505.36 and $1,065.28 for the previous fiscal year, or a combined net increase of $1,976.03.

Public Use of the Parks

There was an 18 per cent increase in the number of visitors to the National Parks as compared with the previous year. Details as to individual parks are given in the following table. Four of these areas were raised to the status of National Historic Parks during the year, and previous attendance records are not available. On the other hand, Buffalo National Park was closed for the present fiscal year.

National Park Visitors

National Parks	1940-41	1939-40
Banff	282,851	235,509
Buffalo	.....	22,006
Cape Breton Highlands	20,151	22,035
Elk Island	49,977	53,821
Georgian Bay Islands	3,157	9,677
Glacier	941	1,200
Jasper	91,057	23,115
Kootenay	73,562	62,063
Mount Revelstoke	9,025	7,500
Nemiskam	14	30
Point Pelee	107,833	134,242
Prince Albert	30,090	27,367
Prince Edward Island	35,665	35,488
Riding Mountain	163,230	129,846
St. Lawrence Islands	16,650	21,600
Waterton Lakes	114,578	108,527
Yoho	112,325	67,539

(Continued on Page 80)

National Park Visitors—Continued

National Historic Parks	1940-41	1939-40
Fort Anne	11,321	17,116
Fort Beausejour	12,488	16,589
Fort Chambly	9,345	.....
Fortress of Louisbourg	10,879	.....
Fort Wellington	8,852	.....
Port Royal	6,662	.....
Total	1,170,653	995,270

EVENTS OF INTEREST

One of the main purposes of the National Parks is to provide healthful recreation for visitors both from home and abroad. To many the satisfaction afforded by the scenery, the trees and flowers, the wild life, the invigorating air, is sufficient in itself. Others appreciate more strenuous or more organized forms of recreation enjoyed individually or collectively in a natural environment.

No attempt will be made to enumerate the various forms of recreation to be had in the National Parks. However, certain of the more outstanding activities for this year are given below.

Banff National Park

The Banff Winter Carnival, always a popular feature, drew a record attendance. Nearly 6,000 visitors came by motor car from many parts of Canada and the United States, and others arrived by rail. Colour was added to the sports events by entries of the Australian and New Zealand airmen. The Carnival was held from February 13 to 15 inclusive and the proceeds were donated by the local committee to the "Spitfire Fund."

Ski-ing was a well patronized sport, both at Mount Norquay, where there is a newly installed ski tow, and at the high-country ski lodges.

From July 26 to 30 the annual 5-day outing was held by the Trail Riders of the Canadian Rockies, the route travelled being from Marble Canyon to Lake Louise through parts of Banff, Yoho, and Kootenay Parks. The Sky Line Trail Hikers' annual meet centred around Egypt Lake. The Alpine Club of Canada held its 1940 camp at Glacier Lake, from which base several neighbouring peaks were climbed, and Youth Hostellers were provided with accommodation in the Spray Valley.

On July 17 the neighbouring Indians gathered for "Banff Indian Days". Advantage was taken of their presence to provide scenes for a moving picture produced by Mr. Michael Powell of Great Britain, through the co-operation of the British and Canadian Governments.

The Banff School of Fine Arts, a co-operative project by the Department of Extension of the University of Alberta and the Provincial Institute of Technology and Art, Calgary, held its Eighth Annual Summer Course in the park during the month of August.

Other facilities of the park were well patronized. The museum was visited by 30,004 people, an increase of 7,653 over the previous year, and the hot mineral springs on the slopes of Sulphur Mountain were made use of by 54,387 bathers, being 7,484 in excess of last year's attendance.

Jasper National Park

The Jasper Junior Chamber of Commerce held a two-day carnival in August for the purpose of raising funds for the construction of a swimming pool. This carnival was very successful and provided a very satisfactory start for this fund. The bath-house at Miette Hot Springs was patronized by 15,261 bathers, an increase of 5,284 over the previous year.

The Totem Pole Golf Tournament held the first week in September each year brought such a large attendance that for future years a limit to the number of entrants has been fixed. This week has become the most active period at Jasper Lodge.

The annual Winter Carnival took place on January 16 and 17 under favourable weather conditions and proved an enjoyable event. An exhibition of fancy skating was staged by the Glenora Club of Edmonton. The annual Bonspiel of the Jasper Curling Club, in which many outside rinks participated was held on January 22, and on March 8 and 9 the Northern Alberta Ski Championships took place.

Mount Revelstoke National Park

This park is one of the best known ski-ing centres in Western Canada. The winter tournament of the local ski club was held on February 18 and 19.

Kootenay National Park

The bath-house at Radium Hot Springs was used by 28,303 bathers, an increase of 3,243 over the previous year.

Elk Island National Park

A successful tournament was held on August 11 by the Elk Island Park Golf Club. Recreational facilities, such as swings, see-saws, checker boards, horse-shoe pitches, and a base-ball diamond, have now been completed and are much in use.

Prince Albert National Park

The golf course was as usual the major attraction, and the Annual Lobstick Golf Tournament had a record attendance, 206 players participating. There were large entries for the Junior and Juvenile Tennis Tournaments which were played on July 6 and 7. Unfortunately the Ninth Annual Tennis Tournament had to be cancelled on account of rain. The Annual Swimming Regatta held on July 27 was well attended. Some 4,200 persons visited the museum.

Riding Mountain National Park

The Seventh Annual Tennis Tournament was held during August and was considered the most important hard court tournament in Manitoba. The Wasagaming Golf Tournament was played during July, with an entry of over 130 players. During the month of July, an annual regatta was put on by the Wasagaming Board of Trade and proved a great attraction. The annual Girls' Softball Tournament was held during August, as well as the Annual Horse Shoe Pitching Tournament.

PUBLIC RELATIONS

Press Contacts

The Canadian press and periodicals gave outstanding co-operation in the publishing of news and information on the National Parks. Special articles appeared in 260 different newspapers and magazines. Articles were also

distributed in the United States of America to publications carrying advertising of the Canadian Travel Bureau. Material was furnished to many writers and other individuals engaged in press and publicity work.

Additional press publicity was obtained through the Canadian Resources Bulletin, a weekly news sheet issued by the Department. One or more current news items and facts of interest about the National Parks appear in each issue. Copies are sent to every important newspaper in Canada and the United States, and to many writers. The total mailing list is 2,700 copies.

Parks Literature

To meet the demands for literature descriptive of the National Parks and Historic Sites, 443,000 copies of publications were printed during the year. Included in these were two new booklets—"Playgrounds of the Prairies" and "Playgrounds of Eastern Canada"—part of a series which describe the parks by groups according to their geographical location. In addition 100,000 copies of an illustrated folder were printed for distribution at the 1940 New York World's Fair.

Material sent out during the year comprised 574,259 copies of parks literature, 15,876 copies of the "Canada Descriptive Atlas," and approximately 16,500 copies of maps and other pamphlets printed by private enterprise. These were distributed to tourist agencies, transportation companies, automobile associations, Boards of Trade and affiliated organizations, as well as to educational institutions and individuals. In addition, copies were made available in the National Parks, many of which contain information bureaux.

A list of the publications printed for the Publicity Division during the year follows:—

	Copies
The Banff-Jasper Highway (Descriptive Booklet)	50,300
Banff National Park (General Information Folder)	25,000
Elk Island National Park (Descriptive Booklet)	25,000
Elk Island National Park (General Information Folder)	25,000
Kootenay, Yoho, Glacier and Mount Revelstoke National Parks (General Information Folder)	25,000
National Parks of Canada (Descriptive Illustrated Folder)	103,600
Playgrounds of Eastern Canada (Descriptive Booklet)	75,000
Playgrounds of the Prairies (Descriptive Booklet)	78,100
Prince Edward Island National Park (General Information Folder)	25,000
Sport Fishing in Canada's National Parks (Descriptive Booklet)	10,000
Catalogue of National Parks Motion Picture Films (No. 5)	1,000
Total	443,000

Films and Lantern Slides

A continued demand for National Parks motion picture films, particularly from travel associations and educational institutions, resulted in a circulation of 4,349 prints. These went out largely to different parts of Canada and the United States, but also reached Great Britain, Australia, South Africa, New Zealand, and Alaska. The reported attendance at showings of National Parks films during the year was 3,052,904 persons.

Park films were shown several times a day in the cinema operated by the Canadian Government at the New York World's Fair. The film library now contains 95 subjects in 16-mm. size, and 88 subjects in 35-mm. size, descriptive of the scenic, recreational, and wild life aspects of Canada's National Parks.

During the year two subjects were produced in 16-mm. Kodachrome film; these were, "The Banff-Jasper Highway" and "Along the Cabot Trail." In addition, a sound film entitled "The Royal Parks" was produced with the co-operation of the National Film Board.

The demand for lantern slides continued, and 3,106 slides were lent to educators and lecturers, together with suitable lecture notes. The library stock was augmented by 189 slides and a large number of existing slides were retouched and remounted.

Illustration Material

Additions to the photographic library included 290 new negatives and 6,312 prints and enlargements. A total of 3,629 photographs and enlargements were distributed for publicity purposes, and 488 half-tone engravings and line-cuts, together with 130 matrices were lent to editors, publishers, and publicity organizations. Sixty-seven photographic enlargements and 162 translites and transparencies were coloured during the year.

Parks Exhibits

An appropriate exhibit was again shown in the Canadian Pavilion at the 1940 New York World's Fair, and co-operation was given to the Canadian Travel Bureau in maintaining a travel information service in the above pavilion. The National Parks Bureau was represented by a specially designed exhibit in the Railway Building at the Canadian National Exhibition, Toronto, which was awarded a gold medal by the Exhibition Association. National Parks photographs, translites, and other material were on view also in Travel and Sportsmen's shows at New York, Cincinnati, Detroit, and Indianapolis.

General

An important conference at Spokane, Washington, held under the auspices of the Pacific Northwest Tourist Association was attended by the Superintendent of Publicity, who also delivered addresses and lectures in many parts of Canada. The Minister issued a special, written invitation to our "Good Neighbours to the South" to visit Canada and include in their itinerary the National Parks. This letter was attached to all correspondence addressed to points in the United States.

MAINTENANCE AND IMPROVEMENTS

This included the maintenance of motor highways and secondary roads, trails, bridges, buildings, and recreational facilities; general maintenance and operation of electric light, telephone, water, and sewage systems; maintenance of streets and sidewalks; collection and disposal of refuse; and mosquito control in the park townsites.

The following table shows the mileage of roads, trails, and telephone lines within the National Parks as of March 31, 1941:—

Region	Roads			Trails	Telephone Lines
	Motor	Secondary	Total		
Banff National Park (including Lake Louise end Banff-Jasper Highway)	187·2	49·5	236·7	755·0	266·5
Cape Breton Highlands National Park	30·0	24·9	54·9	15·0	.....
Elk Island National Park	16·0	2·0	18·0	4·0	16·0
Glacier National Park	.....	6·0	6·0	109·0	1·5
Jasper National Park (including Jasper end Banff-Jasper Highway)	145·0	9·0	154·0	554·0	372·0
Kootenay National Park	61·1	8·0	69·1	152·7	60·0
Mount Revelstoke National Park	18·0	.....	18·0	30·5	10·75
Point Pelee National Park	10·5	.....	10·5	.....	.....
Prince Albert National Park	69·0	75·8	144·8	390·0	151·0
Prince Edward Island National Park	6·7	2·8	9·5	.....	.....
Riding Mountain National Park	50·2	70·0	120·2	119·0	60·5
Waterton Lakes National Park	28·2	25·0	53·2	213·2	60·5
Yoho National Park	44·5	6·0	50·5	194·0	50·0
Total	666·4	279·0	945·4	2,566·4	1,048·75

During the year one improvement of special interest was the application of calcium chloride treatment for dust-laying and road surface consolidation on 14 miles of highway in Banff Park.

New Construction

Several important projects were commenced or completed during the year. The Banff-Jasper Highway, which unites the two largest mountain parks, was completed and opened for regular tourist traffic on June 15, and additional roadside facilities were provided. In Jasper Park, approach roads were constructed to a new bridge built by the Canadian National Railways over the Athabaska River at Jasper. A new road was provided from this point to Maligne Canyon and Jasper Park Lodge. Increased accommodation for visitors to this park was also obtained through the building of bungalow camps by concessionaires. At Waterton Lakes National Park, hard surfacing on the Chief Mountain Highway was completed, and in Cape Breton Highlands National Park, heavy road construction on the Cheticamp-Pleasant Bay section of the Cabot Trail was successfully undertaken, thereby eliminating the most dangerous and difficult portion of this road, and at the same time greatly enhancing the scenic value of the park for visitors.

The golf links at Cape Breton Highlands and Prince Edward Island National Parks were also finished and opened for regular play. At the latter the first 9 holes were open throughout the season, and the second 9 were available by August 15. Tennis courts were completed at Dalvay during May. The Provincial Government of Nova Scotia installed a diesel-electric power plant at the eastern entrance of Cape Breton Highlands National Park, and also provided tourist accommodation there by the construction of a hotel chalet named the Keltic Lodge.

At the request of the Minister of Munitions and Supply, permission was given to the Calgary Power Company to increase the storage facilities of Lake Minnewanka and to construct a hydro-electric development at Anthracite, both areas being inside Banff National Park. The additional power so provided is urgently required for war industry. Work was commenced on the project before the end of the fiscal year. The company is taking over the existing Government power plant and will provide power to Banff townsite. In this connection the park section of the high-tension line from Canmore was completed.

Other items of construction in the parks are briefly summarized below:—

Telephones

Eighteen miles of forest telephone line were reconstructed at Banff, and aerial masts were prepared for radio telephone and 15-watt Marconi transmitters installed in Cape Breton Highlands Park.

Roads and Bridges

Considerable work was done on the extension and grading of secondary roads and trails in Banff, Jasper, Kootenay, and Mount Revelstoke Parks. In most cases these will serve the dual purpose of opening up new scenic areas and of aiding in fire protection. Additions were made to motor roads in Cape Breton Highlands Park and Prince Edward Island Park; relocations were made in Kootenay Park, and seal-coating was completed on the hard-surfaced road in Riding Mountain National Park.

A new steel and concrete bridge was built across Corral Creek in Banff Park, a floating footbridge was constructed at Elk Island to replace one damaged by ice, and two bridges were replaced by galvanized iron culverts in Kootenay Park. Several trestles were completed in Cape Breton Highlands

Park, and a footbridge was constructed there to facilitate fishing. A footbridge was also built over the Vermilion River in Kootenay Park. Six wooden culverts were replaced by galvanized iron pipe and a rustic footbridge was built in Prince Albert Park.

Buildings

Buildings completed in Jasper Park included a warden's shelter at Medicine Lake and fire equipment sheds. A warden's cabin and a workshop and stable were built in Glacier Park. In Prince Edward Island Park a golf club-house and equipment storehouse were built.

General Improvements

Additional guard rails, embankment protection works, and rustic signs were constructed in practically all parks for the protection of traffic. Tourist camp and picnic facilities were improved and increased at the various parks and in Point Pelee Park a considerable portion of the park was fenced.

Private Enterprise

In Mount Revelstoke Park the new Heather Lodge on the summit of the mountain was completed and opened for visitors. This has accommodation for 16 persons and caters principally to ski-ing parties. In Prince Albert Park 6 additional cabins were built at the Bungalow Camp, making a total of 45. These were constructed by the concessionaire. Additional foundations were laid and a cottage completed on approved plans. A new residence and an apartment building were completed at Waterton Lakes Park, and another building converted into apartments. A dining-room and store at a bungalow camp, and improvements to other accommodation were also completed.

CONSERVATION

Forest Protection

The forests form a living background of Canada's National Parks. They regulate stream flow and thus maintain the water levels in the lakes and streams, so essential to recreational development and fish life; they provide shelter for wild animals and birds; their scenic value is inestimable. The protection of these forests from fire therefore constitutes the first and most important phase of park development and management. Numerous fires are due to natural causes such as lightning, but some 84 per cent are caused by human carelessness. To offset this threat of forest desolation provision must be made in the National Parks for the following:—

(1) A lookout system to detect such fires while they are small and controllable;

(2) The location of a strategic network of roads and trails to afford quick access to fire out-breaks;

(3) The employment of highly specialized equipment in the hands of trained personnel to extinguish such fires. These are the items which go to make up an efficient fire protection organization, and are being provided increasingly each year by a program which in the course of the next few years will enable the Department to cope with an ever-increasing fire-hazard in the National Parks of Canada.

In Riding Mountain and Prince Albert Parks networks of steel towers connected by telephone or radio, and occupied by lookout men, have now been completed to give adequate coverage to these areas. In the western mountain

parks a provision is being made for similar detection facilities there. In all National Parks, road and trail construction continues to give greater means of access to outlying parts of these areas for fire protection purposes.

Fire-weather recording stations have been established in each park. These stations obtain daily records of precipitation, evaporation, relative humidity, temperature, and wind velocity, from which factors a day by day record of the fire hazard is computed. This information furnishes the park officers with a reliable measure of fire hazard on a given day and a forecast of what to expect the following day. With such knowledge the protection forces can be distributed to best advantage. In periods of high or extreme hazard all the regular personnel, including work crews, are warned to be on the alert for fire emergency. During periods of low or nil hazard, these forces can be detailed to construction work or other parks duties without fear of interruption for fire duty.

The fire season of 1940 was one of the most serious experienced in the western parks for some years. Sub-normal precipitation and extended periods of drought resulted in many fires. In the National Parks of Eastern Canada the situation was more favourable, owing to weather conditions. A total of 104 fires occurred, which burned over an area of 186,362 acres inside the National Parks, as compared with 120 fires in a burned area of 113,207 acres in 1939. The smaller number of fires and the larger area burned during the current year give some indication of the high hazard conditions which prevailed throughout the greater part of the season.

Fire losses by parks in the fiscal year ended March 31, 1941, compared with losses for the preceding year, are given in the following table:—

Fire Losses in National Parks

Park	Number of Fires	Area Burned Acres		Cost of Suppression	
		1939	1940	1939	1940
				$	$
Banff	21	3	8,885	341.65	20,133.58
Buffalo	1	.....	125	.....	24.50
Cape Breton Highlands	.....	85	.....	195.03	.....
Glacier	1	.....	spot	.....	.....
Jasper	3	spot	spot	40.84	23.65
Kootenay	3	.....	spot	27.17	53.07
Mount Revelstoke	4	2,215	2,904	9,327.62	6,725.58
Prince Albert	22	86	123,705	301.51	20,299.54
Riding Mountain	42	10,817	50,718	5,378.79	9,358.11
St. Lawrence Islands	.....	spot	.....	2.50	.....
Waterton Lakes	4	.....	spot	151.18	91.35
Yoho	3	.....	25	11.75	780.98
Total	104	13,206	186,362	15,778.04	57,490.36

Insects may cause severe damage to forest cover as well as fire. With this fact in mind, the Bureau maintains close co-operation with the Division of Entomology of the Department of Agriculture and assists in the collection of insects for the annual "Forest Insect Survey". Specimens are collected periodically throughout the summer and forwarded to the Division of Entomology for identification. Any control measures which may be necessary are carried out under the supervision of a trained entomologist.

A series of educational lectures on forest conservation was inaugurated during the year. Winter lectures were given in both rural and urban centres surrounding Riding Mountain Park in Manitoba, which is of special importance because of its valuable forest cover.

Wild Life Management

The National Parks are in the best possible position to preserve wild life, because their mandate to preserve comprehends the whole complex of earth and water, hill and dale, forest and plain, rock and snow that goes to make up a park, including the wild life. It is a fundamental fact of wild life management that no living species can be considered apart from its environment, including the other plant and animal species present there.

In so far as each park is a self-contained unit, wild life management brings few problems. The natural interplay of each species makes for a natural solution of such problems as arise, bringing about a condition known by the somewhat misleading name of "the balance of nature". The less the interference required with wild life in National Parks, the more successful, generally speaking, the management. If it is decided to interfere in the processes of nature, such a decision is made only after a most careful investigation.

Obviously, the basic requirement of wild life management is full and accurate information on animals and their environment. This is obtained from the warden service and, as often as possible, by special investigations made by competent biologists. Biologists of the Department's staff visited Riding Mountain, Prince Albert, Elk Island, Jasper, and Banff Parks during the year, and preliminary faunal reports were prepared.

Point Pelee possesses a wealth of plant and animal life of a type relatively unique in Canada; the area is so small and the number of visitors so large that it has been necessary to restrict access to certain sections to persons genuinely interested in plant and animal life, and for this purpose a representative area has been fenced.

The most striking thing about wild life in the National Parks is the fact that animals, rare in other areas, whose lease on life was thought to be poor, thrive in them. Such are the wapiti, bighorn, mountain goat, wolverine, and golden eagle.

Wild Animal Parks

Certain of the National Parks are primarily designed to preserve populations of larger mammals that have been in danger of extinction.

One of these, Buffalo National Park, is now set aside temporarily for war purposes by the Department of National Defence. In view of overcrowding and the incidence of disease, this herd of plains buffalo, and other larger mammals, were slaughtered during the preceding year. This decision was made after full analysis of the situation and on the advice of a highly qualified technical adviser.

The re-establishment of the plains buffalo in Canada has been in no way impaired by the temporary setting aside of Buffalo National Park for war purposes, as there is a large and healthy herd at Elk Island National Park, descended from a portion of the original Allard-Pablo herd in Montana. Large numbers of buffalo are also successfully established under unfenced and natural conditions in Wood Buffalo National Park. The above park was originally set aside to provide protection and feeding grounds for the wood buffalo. A staff of wardens is engaged to patrol the area, secure data on movement and condition of the animals, and effect predator control where needed. The number of buffalo in this park is now estimated at 9,000. Each year certain older buffalo bulls are slaughtered to provide meat for hospitals, missions, and needy native families within the district. There has been a marked increase in the number of muskrats in the park following construction of dams to raise the water level in certain areas. This valuable fur-bearer had been seriously depleted as a result of low water levels and over-trapping. To assist in re-establishment, trapping has been suspended in the areas affected.

The remaining wild animal park is Nemiskam in Alberta. Here a herd of prong-horned antelope is well established. This park has few visitors except those interested in mammalogy or wild life conservation.

Following is a census of wild animals in fenced enclosures within the National Parks, as of March 31, 1941:—

ANIMALS IN FENCED AREAS

Animal	Banff Park Paddock	Elk Island Park	Nemiskam Park	Prince Albert Park Paddock	Riding Mountain Park Paddock	Total
Buffalo	17	1,242	.....	5	60	1,324
Antelope	.....	.....	125	.....	.....	125
Elk	3	500	.....	.....	120	623
Moose	.....	128	.....	.....	3	131
Mule Deer	.....	24	.....	.....	8	32
White-tailed Deer	.....	.....	.....	.....	7	7
Rocky Mountain Sheep	4	.....	.....	.....	.....	4
Totals	24	1,894	125	5	198	2,246

WILD LIFE PROTECTION

The annual study of snowshoe rabbit, or varying hare, conducted for the Bureau of Animal Population, Oxford University, England, was continued. Close co-operation was maintained with the Northwest Territories Administration in matters concerning wild life, as well as with the Royal Canadian Mounted Police in connection with enforcement of the Migratory Birds Regulations and the issue of firearms permits to United States hunters entering Canada.

The National Parks Bureau was represented at the following conservation and scientific conferences pertaining to wild life:—

The Sixth North American Wildlife Conference, Memphis, Tennessee, February, 1941;

The Fifty-eighth Stated Meeting of the American Ornithologists' Union, Boston and Cambridge, Massachusetts, September, 1940;

The Thirty-fourth Annual Convention of the International Association of Game, Fish and Conservation Commissioners, Toronto, September, 1940;

The Seventieth Annual Meeting of the American Fisheries Society, Toronto, September, 1940;

The Twenty-third Annual Meeting of the American Society of Ichthyologists and Herpetologists, Toronto, September, 1940;

The Organization Meeting of the Canadian Conservation Association, Kingston, Ontario, April, 1940;

The Annual Meeting of the Province of Quebec Association for the Protection of Fish and Game, Incorporated, Montreal, Quebec, April, 1940.

Despite the war, no essential wild life conservation service has been discontinued, and this fact undoubtedly had a direct bearing upon the decision of the North American Wildlife Conference to hold its 1942 meeting in Canada.

FISHING AND FISH CULTURE

During the year, fish cultural activities were carried out in eight of the National Parks, namely, Jasper, Banff, Waterton Lakes, Yoho, Kootenay, Elk Island, Prince Albert, and Riding Mountain. In July, the hatchery assistant at Waterton Park was transferred to the hatchery at Jasper. In that month, also, the Parks Bureau secured the services of a limnologist to assist in the scientific administration of fisheries management in the National Parks.

A total of 1,104,800 trout fry and fingerlings were distributed in park waters last year as follows:—

National Parks	Rainbow	Speckled	Cutthroat
Banff	344,300	110,400	3,000
Jasper	439,100	.....	.....
Waterton Lakes	64,600	.....	28,400
Yoho	25,000	.....	.....
Kootenay	60,000	.....	.....
Riding Mountain	30,000	.....	.....
Total	963,000	110,400	31,400

In Riding Mountain Park, where a planting of 30,000 rainbow fingerlings was made this year in Clear Lake in continuing the effort to stock this lake with trout, there are indications that the project is meeting with success.

At Elk Island National Park, an analysis of Astotin Lake water in late winter before the break-up of ice showed that the oxygen content of the water was far below that necessary to support fish life. The lack of success attending efforts to stock this lake may be attributed to natural causes.

In Prince Albert National Park, Waskesiu Lake was opened to fishing, after having been closed for four years. Large numbers of northern pike were caught, and fishermen were loud in their praise of the excellent fishing. The lake was closed during the period that small-mouthed black bass were being introduced. Present information suggests that the introduction of bass will be successful.

In Banff and Jasper Parks, fishing was on a par with previous years, and many limit catches were reported.

In Waterton Lakes Park, fishermen had the best summer ever experienced.

An effort was made during the year to inaugurate an adequate creel census in waters of Jasper, Banff, Waterton Lakes, Yoho, Kootenay, and Prince Albert Parks. Through such a census, information necessary for an intelligent administration of fish cultural matters is obtained. The co-operation of anglers on the whole was only fair, but it is hoped that when the purpose of this census becomes better known, fishermen will be more anxious to assist.

MIGRATORY BIRDS CONVENTION ACT

The Migratory Birds Treaty was signed in Washington, D.C., on August 16, 1916, and made effective by Act of Parliament of Canada in 1917 (Chapter 131, Revised Statutes of Canada, 1927, and Amendments), and was designed for the better protection of the birds that migrate between Canada and the United States.

In this conservation measure, the Dominion and the Provinces co-operate. Regulations are agreed upon and are made effective by both Dominion and Provincial Statutes, the Royal Canadian Mounted Police assisting with the enforcement.

The existing open season of approximately two months for the shooting of migratory waterfowl was continued throughout Canada in 1940. This relatively short season was adopted in 1936 in an effort to restore the losses incurred by migratory waterfowl. The strict daily and seasonal bag limit then imposed, the ban against use of live decoys, and prohibition of baiting waterfowl with grain remain in force.

During the winter of 1939-40, the United States Biological Survey reported serious losses to woodcock on their wintering grounds, and in conse-

quence the open season was reduced to three weeks in the woodcock area of Canada. Continuing the policy of recent years, no open season was allowed for wood ducks, and hunting of Atlantic brant was prohibited, this species not having recovered from the serious depletion of recent years caused presumably by the almost complete failure of one of its chief food products, eel-grass. Sale of migratory waterfowl continued to be prohibited.

In British Columbia the waterfowl situation during the year was in general satisfactory, and the duck population was maintained. In the Prairie Provinces as a whole, improvement was shown. This was particularly so in Alberta over a wide area from near the Saskatchewan border to the western boundary, and from south-central portions northward to well beyond agricultural settlement. Rainfall was exceptional in the aspen grove belt, and innumerable sloughs and pot-holes were filled with water and occupied by waterfowl. Saskatchewan was more irregular. Southern and southwestern parts had a heavy spring run-off and summer rains, and the showing of duck was excellent. Prairie Farm Rehabilitation Act projects, as well as those of private interests, have also provided breeding habitats for a large number of waterfowl. In the eastern portions the rainfall was insufficient. Sloughs and small lakes were still dry, the water table continued to drop, and waterfowl was scarce to absent. Southern Manitoba had a low water table with disappearing lakes, and waterfowl much as in previous years. The major lake area was low in level, but large numbers of ducks were raised in the surrounding marshes and backwaters. Breeding redheads, canvas-backs, and ruddy ducks appear definitely on the increase. However, there was one serious outbreak of botulism in the Netley Marshes, apparently caused by the low levels of Lake Winnipeg during the past 10 years.

Conditions in Ontario and Quebec were satisfactory with no definite change. In the Maritime Provinces the situation was also satisfactory except for brant. Canada geese appear to be making a slow recovery from their low of 1931.

The adverse influence of drought upon waterfowl habitat in the Prairie Provinces has been offset to some extent by water development work under the Prairie Farm Rehabilitation Act as mentioned above. Since the passing of this Act in 1935, 15,223 small projects, 300 community projects, and 54 large projects have been undertaken for the development of surface water resources. This program has entailed a steadily increasing expenditure by the Department of Agriculture, which reached the sum of $3,230,156 in 1940. It has, however, been of direct benefit to waterfowl restoration.

Under the Migratory Birds Convention Act, 59 bird sanctuaries have now been reserved in Canada, giving a total area of 1,282 square miles. Three new sanctuaries were reserved during the year: Boatswain Bay and Isle Cadieux in the Province of Quebec, and Akimiski Island in the Northwest Territories.

During the year, 26 honorary game officers were appointed under the Migratory Birds Convention Act, making a total of 798. The four District Migratory Bird Officers continued to conduct the field administration of the Migratory Birds Convention Act. In addition to their regular duties, they continued the study of the status of the lesser scaup duck, and of waterfowl food habitats in British Columbia, the inspection of bird sanctuaries and other areas, the study of waterfowl conditions in the important prairie duck nesting areas, and faunal investigations in certain national parks. The regular annual patrol of bird sanctuaries in important breeding areas on the north shore of the Gulf of St. Lawrence was continued, and an investigation of waterfowl and their conservation in the James Bay region was made. In the Maritime Provinces, conditions affecting bird life were observed, particular attention being given to the status of woodcock. Lectures were given on the value of native wild birds and their conservation, and successful co-operation was continued with the provincial governments, game conservation societies, and other organizations interested in bird conservation.

The eider-down industry continued to expand in Saguenay County on the north shore of the Gulf of St. Lawrence, with 25 leases in effect. This industry was also initiated under permit in southern Baffin Island for the benefit of the native population and the stock of eiders nesting there.

The banding of native wild birds gives invaluable information to conservationists and ornithologists. Certain problems, such as determination of summer and winter ranges, migration routes or fly-ways, concentration points, mortality rate, percentage of the take of game birds, fluctuations in abundance, sex ratio, longevity, and such related subjects cannot be completely solved without this aid. Bird-banding is conducted in North America in full co-operation between Canada's National Parks Bureau and the United States Fish and Wild Life Service of the Department of the Interior. This work is in charge of the Wild Life Division of the National Parks Bureau in Canada, and has continued to expand steadily since 1923. Practically all birds banded are marked by 200 voluntary co-operators, using official bands. These are persons of definite ornithological attainments, who hold bird-banding permits, under the Migratory Birds Convention Act. During the calendar year 1940, details of the banding of 33,655 birds were added to the official game records, and data relating to 2,754 banded birds captured, killed or found dead were added to the records available for study by officers and organizations concerned with conservation. It must be pointed out that success in this activity depends largely on voluntary co-operation in the reporting of any banded birds recovered, and this assistance is gratefully acknowledged.

During the year, 1,330 permits and licences were issued. Printed material distributed comprised 6,859 copies of Consolidation of the Migratory Birds Convention Act and Regulations; 30,344 copies of Abstracts of the Regulations; 42,458 posters, and 21,463 pamphlets. Motion picture films and slides were lent to voluntary co-operators, and 159 lectures were given by officers of the Bureau.

NATIONAL HISTORIC PARKS

During the year nine historic areas which previously had been added to the national heritage and placed under the administration of this Bureau were designated National Historic Parks.

These parks are of such special interest that a brief description of each seems desirable.

Fort Anne National Historic Park is situated in Annapolis Royal, Nova Scotia. Fort Anne to-day is the outgrowth of two French fortifications built on the same site with later additions made by the English. The museum building, restored in 1935, was originally the Officers' Quarters and was built in 1797-98 under the supervision of Edward, Duke of Kent, the father of Queen Victoria, when he was Commander-in-Chief of the British Forces in North America with headquarters at Halifax, Nova Scotia.

During the year, 5,926 persons visited the museum and, in addition, it is estimated that 5,395 visited the grounds without entering the museum, making a combined total of 11,321 persons to visit the park. Travel groups from the United States, as well as teachers and pupils from Canadian schools, were among the visitors.

A number of interesting articles were added to the collection in the park museum, including a chair which formerly belonged to Thomas Chandler Haliburton, the author of "Sam Slick".

Port Royal National Historic Park is situated at Lower Granville, Nova Scotia. On the exact site where the Port Royal Habitation stood nearly three and a half centuries ago, a replica of the group of buildings which sheltered the first European settlers in Canada has recently been erected. The original

habitation was the headquarters for about two years of Samuel de Champlain, famous explorer and chief geographer to Henry IV of France, who chose the location and drew up the plan of settlement.

The interest that is being taken in the reconstructed habitation is shown by the fact that during the year, 6,662 visitors registered at the park. Careful consideration was given to the question of furnishings for the various rooms and as a beginning, the Artisans' Dormitory has been furnished. The grounds within the courtyard and outside the buildings were levelled and seeded, the flagstone walk from the gate to the office entrance was completed and the floor of the trading-room was retamped and re-earthed.

Fortress of Louisbourg National Historic Park is situated about three miles from the town of Louisburg, Cape Breton Island, Nova Scotia. Here were enacted the early stages of the long struggle which culminated in the possession of Canada for the British Crown. Louisbourg was one of the most keenly disputed fortresses in North America. Erected more than two centuries ago by the French, who had named the settlement in honour of Louis XIV, King of France, it was captured by the British forces in 1745, but was subsequently handed back to the French. The fortress was again besieged by the English and finally captured by them in 1758. It is interesting to recall that one of the brigades of infantry engaged in the recapture of Louisbourg was commanded by General Wolfe, who was later to die heroically at Quebec. Most of the original area of the fortress has now been acquired by the Dominion Government. During the past few years, careful excavation work has been carried out and a museum established at the site. From a visit to this museum and a tour of the grounds, the visitor can reconstruct in imagination a little of the historic past of Louisbourg.

During the year repairs were carried out to the roads and fences, a new bridge was constructed over the moat at the Maurepas Gate and a new electric water pump was installed in the museum basement. Visitors registered at the museum during the year numbered 7,879, and it is estimated that at least 3,000 more entered the park without visiting the museum.

Fort Beausejour National Historic Park is situated near Aulac, New Brunswick. Built by the French, the fort was intended to be an Acadian stronghold against the undefined claims of the English to Acadia. Around the fort, Acadians had their homes and farms. It was captured by the British in 1755 and renamed Fort Cumberland. In recent years restoration work has been carried out and a new museum built at the site.

During the year all telephone poles were removed from the fort grounds and the wires placed underground; a survey was made of a small parcel of land containing the remains of the old entrenchments which it is proposed to add to the fort area; new lawns were seeded; the walks leading to the pavilion gravelled and the museum exhibits rearranged. A total of 7,488 persons signed the museum register during the year and it is estimated that an additional 5,000 visited the park without registering.

Fort Chambly National Historic Park lies about twenty miles southeast of Montreal, Quebec, on a conspicuous headland on the Richelieu River. The first fort, built by the French in 1665 as a protection from the Iroquois, was of wooden construction. After many vicissitudes, it was rebuilt of stone, this work being completed in 1711. In 1760 the fort was surrendered to the British who, with a small armed force, held it until 1775. In that year the Americans captured the fort; they evacuated it the following year, but burned everything that was combustible, leaving only the four walls standing. The fort was later repaired and garrisoned by Governor Carleton and played an important part in the War of 1812. Under the administration of the National Parks Bureau, steps have been taken to arrest the disintegration of the massive structure, and a new museum building has been erected within the walls of the fort. During the

year the reclaimed area adjacent to the new retaining wall was levelled and seeded; the walls of the museum room were painted and the exhibits re-arranged; steps were taken to prevent water from entering the basement of the museum; and the roof of the caretaker's quarters was repaired. During the year, 9,345 visitors signed the museum register.

Fort Lennox National Historic Park is located on Ile-aux-Noix in the Richelieu River, about thirteen miles south of St. Johns, P.Q. The present fort, which stands on the site of one previously erected by the French, was rebuilt by the Imperial authorities in the period from 1812 to 1827, and stands majestically in memory of the defence of the Richelieu Gateway. The island, comprising an area of 150 acres, was acquired in 1921 and considerable work has been carried out on the buildings and grounds. The entire property has been taken over by the Department of National Defence for war purposes.

Fort Wellington National Historic Park is situated at the east end of the town of Prescott, Ontario, and adjacent to Highway No. 2. The fort remains as it was when finally completed in 1838, an impressive landmark. Named after the Duke of Wellington, it was erected when the British authorities decided to fortify Prescott as one of the most vulnerable points of attack in the War of 1812, and as the main base for the defence of communications between Kingston and Montreal. The fort property, comprising eight and one-half acres, was acquired in 1923.

During the year the blockhouse and officers' quarters were painted; repairs made to the caponniere; and the parking area and roadway improved. A total of 8,852 visitors registered during the year.

Fort Malden National Historic Park is situated in Amherstburg, Ontario. The fort was built in 1797-99 by the Second Battalion Royal Canadian Volunteers. It was strengthened in 1812 as the principal military station on the western frontier and dismantled and abandoned in September, 1813. Only slight evidences of the original fortifications remain, and an area of about four acres comprising a portion of these has been acquired. Of particular interest is the fireproof museum, constructed in 1939, which has been suitably furnished and already contains many interesting exhibits. During the year a new steel flagpole was erected and arrangements were made with the Department of Public Works to place the requisite fill at the rear of the shore protection wall facing the Detroit River.

Fort Prince of Wales National Historic Park is situated at the mouth of Churchill River, Churchill, Manitoba, and comprises an area of approximately fifty acres. The fort was built from plans drawn by English military engineers, to secure control of Hudson Bay for the Hudson's Bay Company and England. Construction was commenced in 1733 and completed in 1771. It was surrendered to and partially destroyed by a French naval force under La Perouse in 1782. Its ruins, which are among the most interesting military remains on this continent, have been partly restored and over forty old cannon have been unearthed and suitably mounted on the walls of the fort.

HISTORIC SITES

During the year the following historic sites were marked:—

Pioneer Fox Farming, Alberton, P.E.I.—A cut stone monument with tablet was erected adjacent to the Alberton-Elmsdale Highway, to commemorate the work of Robert T. Oulton and Charles Dalton, pioneers in breeding and raising silver black foxes in captivity, and of James Gordon and Robert Tuplin, who later assisted in developing the industry.

Samuel George William Archibald, Truro, N.S.—A bronze plate was affixed to the Court House Building, in memory of Samuel George William Archibald,

member of the Nova Scotia Assembly, 1806-41; Speaker, 1825-40; Solicitor-General, 1825-31; Attorney-General, 1831-41; Chief Justice of Prince Edward Island, 1824-28; Master of the Rolls and Judge of the Court of Vice-Admiralty, 1841-46. He was born at Truro on February 5, 1777, and died in Halifax on January 28, 1846.

Sir Adams George Archibald, Truro, N.S.—A bronze plate was affixed to the Court House Building, in memory of Sir Adams George Archibald, K.C.M.G., a Father of Confederation; Secretary of State for the Province, 1867-68; Lieutenant-Governor of Manitoba, 1870-72, and of Nova Scotia, 1873-83. He was born at Truro on May 18, 1814, and died at Truro on December 14, 1892.

William Alexander Henry, Halifax, N.S.—A bronze plate was affixed to the Law Courts Building, in memory of William Alexander Henry, a Father of Confederation, lawyer, legislator, and statesman, and Judge of the Supreme Court of Canada, 1875-88. He was born in Halifax on December 30, 1816, and died in Ottawa on May 3, 1888.

William Henry Chase, Halifax, N.S.—A bronze plate was affixed to the Public Archives Building in memory of William Henry Chase, who gave this building to his native province. He was born at Cornwallis on July 16, 1852, and died at Wolfville on November 22, 1933.

Sir Wilfrid Laurier, St. Lin, Que.—A monument in the form of a boulder with a bronze tablet was erected adjacent to the house in which Sir Wilfrid Laurier was born on November 20, 1841. He was Prime Minister of Canada, 1896-1911, and died in Ottawa on February 17, 1919.

Sir John Joseph Caldwell Abbott, St. Andrews East, Que.—A bronze plate was affixed to the Post Office Building, in memory of Sir John Joseph Caldwell Abbott, K.C.M.G., the first Canadian-born Prime Minister of Canada, 1891-92. He was born at St. Andrews on March 12, 1821, and died in Montreal on October 30, 1893. The plate was unveiled under the auspices of the Historical Society of Argenteuil County on September 7, 1940.

Battle of Stoney Creek, near Hamilton, Ont.—A tablet was affixed to the Battle of Stoney Creek monument, in honour of those who fell in the engagement which took place on June 6, 1813. The tablet was unveiled on October 11, 1940, under the auspices of the Women's Wentworth Historical Society.

Blockhouse, Merrickville, Ont.—A bronze plate was attached to the old stone blockhouse, marking it as a fine example of the best type of the blockhouses erected for the defence of the Rideau Canal. It was built about 1832. The tablet was unveiled with suitable ceremonies on June 12, 1940.

Murney Tower, Kingston, Ont.—A bronze plate was affixed to the Murney Tower in Macdonald Park, which was built in 1846, by the Imperial Government for the defence of Kingston harbour and the lake terminal of the Rideau Canal.

Douglas Brymner, Ottawa, Ont.—A tablet was erected in the main entrance of the Public Archives Building, to commemorate the public services of Douglas Brymner, LL.D., F.R.S.C., first Dominion Archivist, whose historical acumen and unflagging industry over a period of thirty years contributed in such large measure to the establishment of the Public Archives of Canada.

Battle of Queenston Heights, Queenston, Ont.—A tablet was affixed to the General Brock monument in honour of those who fell with General Brock in the engagement which took place on October 13, 1812. The tablet was unveiled on October 12, 1940, under the auspices of the Niagara Historical Society.

Rocky Mountain House, Alta.—An area comprising the site of this North West Company Post was acquired and a bronze plate affixed to the remains of one of the original chimneys, which are being preserved as rare examples of the primitive chimneys built by the fur-traders in their posts long before that region had a settled population.

Sir Richard McBride, New Westminster, B.C.—A bronze plate was erected in the Sir Richard McBride Public School, in memory of Sir Richard McBride, K.C.M.G., Premier of British Columbia, 1903-15, and Agent-General of British Columbia, 1915-17. He was born in New Westminster, December 15, 1870, and died in London, England, August 8, 1917.

DOMINION FOREST SERVICE

From the beginning of the present war a very important feature of Canadian policy has been the provision of United States exchange for the purchases of war supplies that could not be had in Canada. The part played by products of the forest and forest industries in our external trade in 1940 has assumed exceptional significance. These industries occupy a special position in the Canadian economy because their extensive exports are not offset by large imports. Trade in all commodities, except "wood, wood products, and paper", together with net exports of non-monetary gold, yielded a credit balance to Canada of only 4 million dollars; but trade in wood and paper provided further credits of 310 million dollars. Exports of these commodities were valued at 348 million dollars and imports at only 38 million dollars. Exports of newsprint paper alone were valued at 151 million dollars, and exports of lumber at nearly 70 million dollars.

Despite serious losses of key personnel to the war services, the Dominion Forest Service, during the fiscal year, was able to assist in Canada's war activities to an increasing degree. At the request of the Director of Internment Operations, sites were provided for internment camps at three forest experiment stations and the Dominion Forest Service undertook to provide useful forestry work for the internees. A grand total of 46,291 man-days' work was carried out by the internees at these stations.

The main effort of the Forest Products Laboratories at Ottawa and Vancouver was directed to war work. Preparation of specifications calling for the use of Canadian woods in place of imported woods, design of munitions containers, and special testing of many kinds were projects undertaken for the Departments of National Defence and Munitions and Supply. The Laboratories were consulted extensively by war industries in the solution of special problems in the use of wood or wood products.

In connection with the organization of the Canadian Forestry Corps, lists of trained forest officers were provided to the Officer Commanding. Following the establishment of the office of the Timber Controller for Canada in the Department of Munitions and Supply, in June, 1940, the Dominion Forest Service co-operated closely with that officer. Two members of the staff of the Service were loaned to the Timber Controller, and a map showing the location of sawmills in Canada, numbering over 6,000, was prepared. In this work every assistance was given by the forest authorities of all provinces.

One of the outstanding advances in the fiscal year was the completion of an agreement with the Canadian Pulp and Paper Association and McGill University for the foundation of the Pulp and Paper Research Institute of Canada at Montreal. This agreement provided for unified direction of pulp and paper research on an expanded scale. The staff of the Pulp and Paper Division of the Forest Products Laboratories located at Montreal has, under the terms of this Agreement, been loaned to the Institute. Since its establishment, the Pulp and Paper Institute has undertaken important investigations having to do with the war effort.

Forest resources play an important part in the effective prosecution of the war and must be looked to to play an increasingly important part in the difficult reconstruction period which will follow the war.

FOREST ECONOMICS

The Canadian forests, and the industries that they provide with raw materials, gave valuable assistance to the war effort of Canada and the Empire during 1940.

The United Kingdom is the largest importer of lumber in the world. Ordinarily she obtained more than three-quarters of her total softwood requirements from European countries, among which the chief lumber exporters were the Scandinavian and Baltic countries, the Soviet Union, and Poland. When ports of these countries were closed by enemy action, Canada remained as almost the sole source of supply on which the Mother Country could rely. The volume of lumber shipped to the United Kingdom totalled 1,616 million board feet, exceeding the previous record shipments of 1939 by 392 million board feet. Through special arrangements with the railroads, it was possible to transport a substantial proportion of the total shipments by rail from British Columbia to eastern ports, in order to conserve ocean cargo space.

Approximately 400 million board feet of domestic lumber were used in Canada for war projects, including new factories, offices, and training camps for the armed services. Notable among the 5,000 wooden buildings erected were 335 timber-framed aircraft hangars and drill halls. These buildings had free spans of 112 feet, and their zinc-chloride treated trusses and columns were built up through use of modern timber connectors. In addition to lumber used in construction, very large quantities were needed for containers such as boxes and crates.

The demand from aircraft builders for Sitka spruce of the highest quality equalled that during the last war, although the majority of military aircraft are now of metal construction. Selected yellow birch logs provided large quantities of high-quality veneers for the manufacture of wing coverings. The newly established pit-prop industry forwarded many shiploads of mining timbers to the coal mines of England and Wales.

To meet the abnormal conditions created by wartime demands, and to ensure that available stocks should be used to the best advantage, the office of Timber Controller for Canada was created in the Department of Munitions and Supply. Through co-operation between the Controller and the lumber trade excellent results were obtained, and price movements were held within a narrow range.

The estimated volume of merchantable timber in Canada's forests is shown in the following table:—

Merchantable Timber

Millions of Cubic Feet

—	Accessible	Inaccessible	Total
Conifers	146,300	89,723	236,023
Broad-leaved	65,356	11,761	77,117
Total	211,656	101,484	313,140

Average annual depletion of merchantable timber during the ten-year period 1930-39 is estimated at 3,623 million cubic feet, which is equivalent to 1·7 per cent of the volume of accessible timber.

Average Annual Depletion, 1930-39

	Millions of Cubic Feet
Volume used	2,519
Merchantable timber burned	404
Destroyed by insects, fungi, etc.	700
	3,623

Approximately 70 per cent of the total depletion was used, and 30 per cent wasted.

It is not yet possible to estimate depletion in 1940; but, considering the forests as a whole, it seems unlikely that war requirements will increase total depletion to any dangerous degree. On the other hand, the abnormal demands for such special products as Sitka spruce and high quality yellow birch logs may make heavy inroads into the reserves of these species.

A depletion rate of 1·7 per cent is not high, particularly when there are large inaccessible areas in reserve. But a large proportion of that depletion is concentrated on the most accessible and most valuable parts of the forest. There is, then, a condition in which much of the forest is not being used while severe over-cutting is taking place in certain localities. To a considerable degree, this state of affairs is unavoidable under conditions as they exist in Canada to-day, but it must be borne in mind if the significance of depletion figures is to be correctly understood.

The relative importance of the principal branches of forest industry in 1939 is indicated in the following table:—

FOREST INDUSTRIES

Summary of Principal Statistics, 1939

—	Number of Employees	Salaries and Wages	Net Value of Products
		$	$
Woods operations[1]	98,000	79,000,000	157,747,398
Lumber industry	32,399	26,396,308	44,852,358
Pulp and paper industry	31,016	44,737,379	103,123,660
Wood-using industries	31,305	28,363,615	43,561,693
Paper-using industries[2]	12,341	14,285,258	27,792,626
Totals	205,061	192,782,560	377,077,735

(1) The figure given for number of men employed in the woods is an equivalent calculated on a man-year basis.

(2) Exclusive of the printing trades.

The net value of all products of the forest industries in 1939 exceeded that of the previous year by 10·3 per cent.

AERIAL FOREST SURVEYS

Further refinements were made in the design of the duoscope, a patented instrument developed by the Forest Service for the transfer of information from aerial photograph to map. One instrument was sent to England in order that its value in plotting aerial reconnaissance data might be tested by military authorities under service conditions. The duoscope has been adopted for mapping purposes by 16 organizations, mostly in the forest industries.

Improvements in the illumination system of the photoelectric planimeter increased the efficiency and reduced the cost of construction of the instrument. This planimeter has been developed by the Forest Service to facilitate the measurement of mapped areas.

A field test of the accuracy of detailed estimates of pulpwood volumes prepared from aerial photographs was completed in co-operation with a commercial company in New Brunswick. The stands surveyed contained a considerable admixture of hardwoods, and the photographs used were taken in winter. The company reports that on an area of 1,203 acres of mixed forest the quantity of coniferous pulpwood actually cut was 3·2 per cent less than the estimated volume. This test indicates that estimates of gross volume of coniferous pulpwood can be made from winter photographs with accuracy sufficient to meet operating requirements. A similar test in softwood forests is in progress on an area of five square miles near Baie Comeau, P.Q.

Detailed forest maps and timber estimates were completed for the Petawawa Forest Experiment Station, the area dealt with during the current year being 38 square miles.

Forest areas of 27 square miles in the vicinity of Lake Minnewanka in Banff National Park were mapped, and timber estimates were prepared for 2·3 square miles which will be submerged when the level of this lake is raised. Timber was also estimated on a small flooded area in the Northwest Territories.

Further work was done in estimating fuelwood available to Indians on the reserve at Oka, P.Q. Estimates for timber disposal purposes were prepared for two Indian reserves in Saskatchewan and one in Ontario.

Forest inventory maps covering 1,325 square miles in Nova Scotia, 420 square miles in Prince Edward Island, and 386 square miles in Saskatchewan were completed. This information is turned over to the provincial authorities as it becomes available.

SILVICULTURAL RESEARCH

The Dominion Forest Service operates 5 forest experiment stations, each representative of conditions in a major forest region. These stations are utilized for the conduct of silvicultural research and investigations respecting the rates and conditions of growth of the main tree species found in these regions. Information obtained as a result of long-term experiments is assembled and results showing promise are applied on larger areas for demonstration purposes. Special attention is paid to the cultural treatment of second growth stands which have come in as a result of cutting or fire, or both. These young forests are important because from them Canada's forest industries must draw their next crop. Under scientific management a better crop of higher grade material can be obtained in a shorter time than would be possible if these stands were left to develop under natural conditions.

Naturally the timber on the forest experiment station areas does not include all types and age classes occurring in their respective forest regions. Work at the stations must, therefore, be supplemented by additional studies conducted on outside areas in co-operation with the provincial authorities and the forest industries.

In general, the forest experiment stations are essentially field laboratories to devise methods of treatment which can be applied by industry to its own holdings as economic and other conditions make that action feasible and desirable.

Research projects at the forest experiment stations have now been classified in accordance with the new Classification for Forest Research Projects developed last year.

Forest Botany

Standardized forms and plans have been prepared for collection of phenological data on a uniform basis by the several interested agencies, but owing to abnormal conditions these are not yet in use. Weekly records were taken according to the Forest Service standard at the Acadia, Petawawa, Riding Mountain and Kananaskis stations.

In connection with war requirements for yellow birch veneer stock, an estimate of yellow birch supplies in Canada was made. This estimate was based on rate-of-growth surveys of 1929-30 and on reports obtained from timberland holders in the Provinces of New Brunswick and Quebec. The total supply is estimated to be 27 billion feet board measure, material 10 inches in diameter at breast height. This volume, however, makes no provision for cull. Subsequent reports suggest that not more than 10 per cent of the stand is suitable for veneer purposes.

In co-operation with the Quebec Forest Service and holders of certain pulpwood lands, a study of the practical application of the site-type classification system in estimating timber for working plan purposes was started. Upon examination a definite relationship between site-type, height growth, and topography was found to exist. On the basis of a five-type classification an extensive working-plan survey combining aerial photography, line-plots, and transect sample plots was undertaken.

A comprehensive report on budget determination for sawmill operations in northern Saskatchewan was prepared. This report, based on a number of surveys of cut-over lands, offers a plan of cutting for sustained yield. It offers, alternatively, a two-cut system of management, designed to prolong operations beyond the closing date likely from methods now in common practice.

A brief tabular statement was prepared from rate-of-growth and various regeneration surveys, which shows how the proportion of spruce tends to increase over that of balsam fir as the stand develops from seedlings to standards. Although there is considerable variation from province to province, and from cover-type to cover-type, the trend for the proportion of spruce to increase as the stand matures is constant. The most pronounced instance is that of the softwood cover-type in Nova Scotia, where spruce represents only 9 per cent in the seedling class, and 75 per cent in the standards. The least variation is found in the mixed-wood type in Algonquin Park where spruce seedlings constitute 25 per cent of the total seedlings and 67 per cent of the standards. These data suggest that there is no cause to fear that balsam fir will replace spruce in the future stands.

A series of thirty volume tables has been issued as a supplement to those issued in the volume table booklet of 1936. These include local tables for eastern white cedar, yellow birch, hard maple, beech, and poplar.

Genetics

Genetic studies are carried on at the Petawawa Station in co-operation with the Associate Committee on Forestry of the National Research Council. Considerable progress has been made in vegetative propagation of stem cuttings, notably with white pine and Norway spruce. Development of a means of reproducing white pine vegetatively envisages the possibility of producing blister rust-resistant and weevil-resistant white pine stock. An important discovery is that Alfred peat humus and sand is a satisfactory medium for the rooting of white pine cuttings. Late July or August seems to be the most favourable season for planting pine cuttings.

Technique in the methods of propagating poplar cuttings has been improved. Propagation of basswood cuttings has not yet been successful. Studies in propagation by root cuttings and by grafting are now under way. Many strains and species, native and exotic, are being tested at the several stations. A strain

of Scotch pine from Finland gives indication of better growth and form than the strains usually cultivated in Canada.

Certain strains of white pine from regions of moist climate show better results if spring sown—an important factor in reducing loss of seed from rodents. A strain of western white pine that gives promise of rust-resistance was sown. Selected Douglas fir seed from Shuswap Lake gives promise of successful results.

Of the many poplars under investigation, selection is now being made of the hardy varieties. The aspen-silver poplar hybrids seem to be superior to cottonwood-balsam poplars. Similar investigations are in progress at the Acadia and Kananaskis stations. Tree-testing gardens have been established at Petawawa and Acadia, to study the silvical characteristics of selected strains and species.

Ecology

Studies of factors influencing natural reproduction on open lands, seed dissemination, and influence of various methods of treating the seed-bed to obtain natural reproduction were carried on at all the stations.

Silviculture

The major activities at all stations are those connected with seeding and planting, and more particularly with intermediate and final cutting methods. Notable success has been had at Petawawa in germinating basswood seed. Basswood seems to require three years to germinate. Special care is required in preparation of the soil. The seed must be protected against rodents. The length of time for stratification of ash seed varies with species. Good progress has been made in methods of preparing nursery soils adapted to various species. Extensive use is being made of sawdust added to the soil, and of soy beans and vetch as soiling crops. Progress has also been made in methods of raising seedlings. Broadcast seeding seems to be more successful than drill seeding.

Developments have been made in transplanting and planting technique. Studies in thinnings of all species are under way at all stations. These include thinning and pruning of red pine plantations to spacings of 10, 12 and 14 feet. Effect on crown and form development and stem growth is under observation. Cost data have been taken. Studies at Acadia are in the spruce-balsam-white birch cover-types; at Kananaskis in spruce and lodge-pole pine types. At the Acadia, Valcartier, Petawawa, and Kananaskis stations extensive improvement and harvest cuttings were conducted in the form of timber sales and permits, and to provide fuelwood for military training camps and internment camps. Returns from these operations are as follows:—

—	Saw timber	Fuelwood (Cords)	Mine timber (Lineal feet)	Returns $
Acadia—				
26 permits		853		513 80
Internment		1,325		795 00
Total		2,178		1,308 80
Valcartier—				
15 permits	2,250 cu. ft.	376		426 00
Camp	38,000 "	2,271		1,114 00
Total	40,250 "	2,647		1,540 00
Petawawa—				
54 permits	929,908 cu. ft.			19,891 99
Internment		1,200		900 00
Total	929,908 "	1,200		20,791 99
Kananaskis—				
42 permits	906,000 bd. ft.	1,005	238,000	6,364 41
Internment		2,741		1,404 75
Total	906,000 "	3,746	238,000	7,769 16

Mensuration

A new series of merchantable volume tables for pines and hardwood species has been prepared and published in Research Note form. Developments have been made at Petawawa in scaling technique to provide for cull factors.

Protection

Meteorological and fire hazard records were kept throughout the season at the Acadia, Petawawa and Kananaskis stations.

The Forest Pathological Service, Department of Agriculture, conducted ten projects at the Petawawa station, concerned with diseases in pines and poplar. The Entomological Service, Department of Agriculture, studied problems of white pine weevil, larch sawfly, and tent caterpillar at this station.

The following Research Notes were issued in mimeographed form: No. 57, Thinning and Pruning Experiments, Red Pine Plantation, by J. W. B. Sisam; No. 58, General Outline for Reproduction Studies, by R. H. Candy; No. 59, Some Simple Management Methods Applied to Farmers' Woodlots, by W. M. Robertson; No. 60, Some Observations on a Visit to New England and New York, by C. C. Heimburger; No. 61, Classification for Forest Research Projects; No. 62, Experimental Girdling in Mixedwood Stands, New Brunswick, by W. B. M. Clarke; No. 63, Sprout Control in Wire Birch Stands, New Brunswick, by W. B. M. Clarke; No. 64, Silvicultural Research Operations, 1939-40; No. 65, Site-types and Rate of Growth, Lake Edward, P.Q., by R. G. Ray.

FOREST PROTECTION

Research work in forest fire protection is carried on by the Dominion Forest Service at its forest experiment stations, and at other points in co-operation with the National Research Council, with various Provincial Governments, and with forest industries. This work includes the improvement and extension of methods for the daily measurement and forecasting of forest fire-hazard now widely used by various forest-protective agencies as a guide to administrative action, also studies directed to the improvement of methods, equipment, and technique for detecting and suppressing forest fires, and increasing the general effectiveness of fire-protective effort.

As in previous years, the Forest Service undertook responsibility for the compilation of annual statistics of forest fire losses in Canada, from information supplied by provincial forest services and other forest-protective organizations.

Considering Canada as a whole, the fire season of 1940 was about normal. From the Great Lakes eastward the fire situation was better than the average for the past ten years, but Western Canada experienced worse than normal conditions. The total of fires reported was 6,284 compared with an average of 6,087 for the period 1931-40. Twenty-five per cent of these fires were started by lightning, as against an average of 16 per cent attributed to this cause during the past 10 years. The total loss and damage, including cost of fire-fighting, was $3,776,652 as compared with an average of $4,498,463 for the ten-year period 1931-40. Detailed statistics of forest-fire losses and causes for Canada as a whole, in each of the 10 years 1931-40, will be found in Tables 1 and 2 (pp. 104 and 105). Table 3 (p. 106) gives the corresponding figures by regions together with the number of fires, the proportion caused by lightning, the areas burned, and the fire losses.

A short description of the fire season, by provinces, follows:—

British Columbia.—The months of June, August, and September were generally dry but the other months of the fire season were wetter than normal. The number of fires started by lightning was unusually large. This cause

accounted for 54 per cent of the fires compared with the ten-year average for the province of 29 per cent. The total number of fires was 39 per cent above the normal for the ten-year period 1931-40 and the cost plus damage was 3 per cent above normal.

Alberta.—This province again experienced much dry weather over certain forest areas. Although the total number of fires was 12 per cent below normal, many of these fires were difficult to control and the total cost, inclusive of damage, was 13 per cent above the average for the ten-year period 1931-40.

Saskatchewan.—Owing to scanty winter precipitation and sub-normal rainfall throughout the season, the fire season of 1940 was the worst experienced since the disastrous fires of 1937. The total number of fires was 72 per cent above the average for the ten-year period 1931-40 and the cost plus damage was 21 per cent above normal.

Manitoba.—The fire-hazard conditions were the worst experienced in many years. The total number of fires was 666, the greatest number on record, exceeding the previous record of 660 in 1929. The area burned, however, was less than in the bad years of 1929 and 1930. Low winter precipitation in the inter-lake region resulted in a large number of winter camp-fires smouldering in the ground and spreading rapidly with the advent of dry spring weather. In many cases these ground fires could not be reached before they had done much damage, owing to the inability of aeroplanes to land on the melting ice. In the region around Lake Winnipegosis fires burned from early spring until autumn, and in August an extremely bad situation, continuing into October, developed east of Lake Winnipeg. The total number of fires during the season was 63 per cent above the average for the ten-year period 1931-40 and the cost plus damage was 104 per cent above normal.

Ontario.—The fire season in general was a moderate one. The spring hazard was high throughout and in the latter part of the summer a very high hazard developed in the western part of the province. In the east the hazard was mostly normal to low after rains in early June ended the spring hazard. The total number of fires was 35 per cent below the normal for the ten-year period 1931-40 and the cost plus damage was 69 per cent below normal.

Quebec.—The fire season for 1940 was on the whole favourable, rainfall, with a few exceptions, being well distributed. The total number of fires was 21 per cent below the average for the ten-year period 1931-40 and the cost, including damage, was 74 per cent below normal.

New Brunswick.—The forest fire season was again favourable, precipitation being well distributed, with no extensive dry periods. Spring brush-burning by settlers was controlled when the fire-hazard increased, and as the public is becoming educated to the necessity of strict enforcement of the regulations in this connection, desired results are being attained. The chain of forest weather stations was again in operation and the fire-hazard index was computed daily for all regions and used in fire-protection planning. The total number of fires was 15 per cent below the normal for the ten-year period 1931-40 and cost plus damage was 94 per cent below normal.

Nova Scotia.—This province experienced a better than average year. The total number of fires was 30 per cent below the average for the ten-year period 1931-40 and cost plus damage was 54 per cent below normal.

Dominion-protected Lands.—These comprise National Parks, Indian Reserves, and Dominion Forest Experiment Stations. Fire losses were much above normal in some of the National Parks in the western provinces owing to the exceedingly high hazard conditions which prevailed in those regions. With these exceptions Dominion-protected lands experienced a favourable fire season.

Fires which occurred in these areas are not included in the statistics of the provinces in which such lands are located, but are shown separately in Table 3.

Forest-fire Research

At the Petawawa Forest Experiment Station work was continued with the object of improving the system of measuring and forecasting forest fire-hazard, developed at this station. At the Fredericton Fire Hazard Station and the Acadia Forest Experiment Station studies were continued in co-operation with the province and with forest industries with a view to adapting this system to meet most adequately the needs of forest protection in New Brunswick. At Kananaskis Forest Experiment Station basic research work on fire-hazard conditions peculiar to the east slope of the Rocky Mountains was continued. Weather stations were established at suitable points in Banff, Jasper, and Waterton Lakes National Parks for the purpose of computing the daily index of fire-hazard in these areas. The operation of the system of fire-hazard measurement in Riding Mountain and Prince Albert National Parks was also supervised from the Kananaskis Station.

Numerous tests and experiments were made with new fire-protection equipment. A variable-stream nozzle for hand-spray pumps was designed, as well as an improved device for repairing linen fire hose.

TABLE 1

Statement of Forest Fires in Canada by Years for the 10-Year Period 1931-40, with Average for the Period

Item	Year										Total	Average
	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940		
Fires under 10 acres	.....	.....	.....	.....	.....	4,031	3,886	4,476	3,990	4,477	.....	.....
Fires 10 acres and over	.....	.....	.....	.....	.....	1,915	2,063	2,171	1,623	1,807	.....	.....
Total number of fires	6,965	6,298	6,298	5,911	4,955	5,946	5,949	6,647	5,613	6,284	60,866	6,087
Total area burned.....acres	2,093,922	2,463,923	1,008,558	1,475,117	856,183	3,026,646	4,271,431	3,125,768	1,115,179	2,691,135	22,127,862	2,212,786
Merchantable timber—												
Area burned.....acres	394,824	708,085	204,405	321,414	172,592	919,764	662,792	722,199	199,288	462,454	4,767,817	476,782
Timber burned.....M ft. b.m.	583,551	569,126	255,383	899,545	98,971	2,077,584	408,942	2,160,192	196,803	478,879	7,683,976	768,398
Timber burned.....cords	1,241,647	2,705,374	650,318	836,554	785,552	3,524,493	4,354,820	2,557,780	911,051	1,726,348	19,293,937	1,929,394
Estimated stumpage value.. $	1,715,113	5,063,577	1,199,305	1,754,882	1,254,981	4,646,726	2,082,018	2,777,882	599,315	1,355,322	22,449,121	2,244,912
Young growth—												
Area burned.....acres	590,234	586,141	220,620	242,101	191,940	739,701	2,035,830	719,461	326,358	788,425	6,440,811	644,081
Estimated value..... $	1,215,682	1,209,063	454,648	573,455	326,423	1,284,102	1,161,861	1,286,512	448,924	906,228	8,866,898	886,690
Cut-over land—												
Area burned.....acres	535,418	772,625	331,614	562,446	258,964	303,348	188,385	548,792	266,542	197,295	3,965,429	396,543
Estimated value..... $	219,776	615,605	187,303	246,031	262,725	66,253	155,276	328,737	*188,163	196,157	2,466,026	246,603
Non-forested area burned...acres	573,442	397,069	251,918	349,156	232,687	1,063,833	1,384,424	1,135,316	322,991	1,242,961	6,953,797	695,380
Other property burned, value $	363,516	264,769	162,075	149,923	355,541	84,560	151,809	827,804	283,798	376,488	3,020,283	302,028
Total damage..... $	3,514,087	7,153,014	2,003,331	2,724,291	2,199,670	6,081,641	3,550,964	5,220,935	*1,520,200	2,834,195	36,802,328	3,680,233
Actual cost of fire fighting.... $	931,504	683,650	509,939	827,451	526,743	1,206,863	878,563	1,045,637	629,497	942,457	8,182,304	818,230
Total damage and costs.. $	4,445,591	7,836,664	2,513,270	3,551,742	2,726,413	7,288,504	4,429,527	6,266,572	*2,149,697	3,776,652	44,984,632	4,498,463

* This is less by $579,624 than shown in the 1939 report owing to an error of over-valuation in Alberta returns in that year.

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TABLE 2

Statement of Forest Fires in Canada by Causes for the 10-year Period 1931-40

Cause	Year																				Total No. Fires	Average 1931–40	
	1931		1932		1933		1934		1935		1936		1937		1938		1939		1940			No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Camp-fires	1,481	21	1,329	21	1,202	19	1,111	19	875	18	1,185	20	1,235	21	1,390	21	1,108	20	1,067	17	11,983	1,198	20
Smokers	998	14	809	13	893	14	971	17	985	20	947	16	860	14	980	15	1,004	18	1,115	18	9,562	956	16
Settlers	1,097	16	1,385	22	1,265	20	946	16	1,143	23	567	9	973	16	1,154	17	845	15	808	13	10,183	1,018	17
Railways	625	9	354	6	312	5	255	4	192	4	176	3	232	4	176	3	185	3	210	3	2,717	272	4
Lightning	880	13	651	10	940	15	957	16	331	7	1,529	26	832	14	1,046	16	796	14	1,569	25	9,531	953	16
Industrial operations	133	2	91	1	94	1	198	3	123	2	132	2	190	3	176	3	112	2	132	2	1,381	138	2
Incendiary	674	10	746	12	511	8	349	6	400	8	608	10	383	7	558	8	465	8	306	5	5,000	500	8
Public works	97	1	47	1	56	1	104	2	35	1	42	1	88	1	57	1	75	1	30	1	631	63	1
Miscellaneous known	368	5	243	4	300	5	365	6	324	6	288	5	528	9	488	7	590	11	525	8	4,019	402	6
Unknown	612	9	643	10	725	12	655	11	547	11	472	8	628	11	622	9	433	8	522	8	5,859	586	10
Totals	6,965	100	6,298	100	6,298	100	5,911	100	4,955	100	5,946	100	5,949	100	6,647	100	5,613	100	6,284	100	60,866	6,086	100

TABLE 3

Statistics of Forest Fires by Regions, 1940

Averages given are those for the ten-year period 1931–40

Item	British Columbia		Alberta		Saskatchewan		Manitoba		Ontario	
	1940	Average	1940	Average	1940	Average	1940	Average	1940	Average
Fires—										
Total number	2,338	1,676	313	358	427	248	666	404	1,014	1,563
Caused by lightning ... %	54	29	3	4	1	5	5	9	21	21
Areas burned, acres—										
Merchantable	76,977	66,877	143,037	123,186	73,573	47,479	82,516	32,635	42,205	146,948
Young growth	53,582	79,572	207,662	154,866	319,931	235,324	69,138	33,090	36,380	76,752
Cut-over	61,690	213,538	14,948	17,496	41,194	15,250	14,815	4,506	37,928	21,471
Non-forested	297,754	66,540	108,597	164,592	348,564	158,115	411,627	144,191	5,101	94,034
Total	490,003	426,527	474,244	460,140	783,262	456,168	578,096	214,422	121,614	339,205
Damage ... $	647,352	872,982	968,979	835,299	238,317	195,731	311,104	124,823	279,267	1,004,194
Cost of fire-fighting ... $	441,772	190,669	65,991	74,686	87,481	62,121	71,461	32,879	119,891	268,561
Total damage and costs ... $	1,089,124	1,063,651	1,034,970	909,985	325,798	257,852	382,565	157,702	399,158	1,272,755

Item	Quebec		New Brunswick		Nova Scotia		Dominion Lands					
							National Parks		Indian Lands		For. Expt. Stations	
	1940	Average	1940	Average	1940	Average	1940	Average	1940	Average	1940	Average*
Fires—												
Total number	861	1,087	220	260	251	356	104	79	83	51	7	7
Caused by lightning ... %	2	5	16	12	0	0	15	9	15	14	0	13
Areas burned, acres—												
Merchantable	6,623	41,506	182	7,522	808	1,477	34,169	6,245	2,364	2,503	0	449
Young growth	4,963	36,522	390	6,634	1,980	4,612	92,342	14,283	1,980	1,641	77	873
Cut-over	17,465	110,564	433	10,241	564	1,269	7,494	1,504	756	673	8	36
Non-forested	10,897	20,482	1,002	24,457	2,265	9,181	52,357	11,179	4,794	1,981	3	719
Total	39,948	209,074	2,007	48,854	5,617	16,539	186,362	33,211	9,894	6,798	88	2,077
Damage ... $	98,545	524,037	2,874	80,623	4,346	21,774	277,417	61,824	5,890	11,359	104	6,165
Cost of fire-fighting ... $	70,856	118,844	3,624	26,874	16,023	22,376	57,490	16,461	7,689	4,296	179	594
Total damage and costs ... $	169,401	642,881	6,498	107,497	20,369	44,150	334,907	78,285	13,579	15,655	283	6,759

* Exclusive of 1933.

White Pine Blister Rust

Although the need for effective, co-operative action toward controlling the progress of this disease in Canada's eastern white pine forests continues, imperative war requirements through the year 1940-41 prevented allocation of funds and the carrying on of active field work.

The extensive reconnaissance surveys of recent years in the white pineries of the lower Ottawa Valley have made it clear that the first logical step toward protecting the pine lies in destroying the domestic black currant bushes throughout that region. In the State of Michigan, where conditions are almost similar, this was the first step taken, and at once an appreciable decrease in the rate of spread of the blister rust was observed.

In May, 1940, a co-operative research study was begun at Petawawa and points farther west to obtain data on the present degree of infection and course of development of the rust on Crown lands. Members of the Division of Botany and Plant Pathology of the Department of Agriculture and of the Forest Service co-operated in this initial field work, which consisted of laying out and analysing several series of line plots. To reach useful conclusions further work will be required.

By reason of the relative dryness of the white pine belt in eastern Ontario and western Quebec, the natural forest conditions are favourable for control of the blister rust. Moreover the great value of the white pine, whether for commercial or scenic purposes, makes it highly desirable that such a protective campaign be undertaken.

FOREST PRODUCTS LABORATORIES

The Forest Products Laboratories devote attention to scientific and technical problems pertaining to the manufacture, use, and marketing of the products of the forests. Of particular importance is improvement in mechanical and chemical processes and the curtailment of waste in the forest, in manufacturing plants, and in the use of forest products. Close collaboration is maintained with industry and with organizations working in similar or related fields in other countries.

During the past year a very large portion of the time of the laboratories was devoted to the preparation of specifications for wooden construction of various types associated with the war effort, to testing of special constructions and assemblies, and to committee and consulting work with various war departments.

The main laboratories are located in Ottawa. A branch laboratory is operated in Vancouver in association with the University of British Columbia. Pulp and paper problems of the laboratories are dealt with through an arrangement with the Canadian Pulp and Paper Association and McGill University for the joint operation of the Pulp and Paper Research Institute in Montreal.

Following are brief references to some problems which have received attention during the year in the three laboratories.

Main Laboratories, Ottawa

DIVISION OF WOOD PRESERVATION

Considerable work was carried out in treating timber with fire-retardants for military services. Work was continued on the testing of fire-retardant paints for military purposes, several being found which gave satisfactory performance. A process was developed for increasing the fire-resistance of plywood without the use of elaborate or expensive equipment.

Work on zinc chloride, chromated zinc chloride, zinc silico-fluoride, and lead silico-fluoride to find out their toxicity and resistance to leaching, was

completed. Chromated zinc chloride showed appreciably greater resistance to leaching than zinc chloride. The fluosilicates were most readily leached.

Considerable new data were assembled on the service life of timbers in commercial structures under observation in different parts of Canada.

Timbers cut in the spring, summer, and autumn were kept under observation to determine their relative durability under certain soil conditions.

Observation of poles treated in 1938-39 indicates that air-seasoning followed by a treatment with a low-residue creosote oil will ensure adequate sapwood penetration and a minimum of " bleeding " after treatment.

Member companies of the Canadian Electrical Association supplied material and labour for the erection of 176 treated stubs for service tests in the laboratory test plot to determine the efficiencies of different treatments of poles.

Samples of tar produced in Canada from western coal by a medium temperature process were examined and found to have valuable properties as wood preservatives.

DIVISION OF TIMBER MECHANICS

A large volume of work was carried out on the assembly of plywood with different types of adhesives to determine the effect of subjecting wood to high temperatures in the press and of different temperatures, pressures, and periods of pressure on the quality of the bond. Particular attention was paid to phenol and urea resin adhesives now used so widely for aircraft and other exacting requirements.

The investigation of different types of frame-wall construction, undertaken originally in connection with Dominion Housing, was extended to meet requirements for military construction. A design of roof panel made from weatherproof plywood was submitted for test for use in building munition plants.

Joints with ring-connectors have been used extensively in military and other structures. The work of the laboratories in securing data on this type of joint has proved invaluable in connection with establishing permissible stresses for Canadian timbers jointed in this manner. During the year analyses were completed of the tests made upon joints of the more important Canadian structural timbers having the members at angles of 30 degrees, 45 degrees, 60 degrees, and 90 degrees.

Having in view heavy demands on the supply of Sitka spruce for aeroplane timber, work was carried out on eastern spruce to determine whether appreciable quantities of such material could meet exacting specifications for aircraft spruce.

In order also to assist in meeting the demand for high-grade spruce an investigation was carried out on the building up of laminated aeroplane spars using combinations of hardwood and softwood laminae. The investigation included a study of the effect of scarfed joints on the strength of the assembly.

Special attention was paid to the use of wood and plywood in aircraft. Problems have been dealt with pertaining to various methods of assembling veneers; basic strength factors of plywood for various purposes; the efficiency of different adhesives; technique in the manufacture of aeroplane propellers; the testing of plywood and of aircraft glues to Air Force specifications; and co-operation with the Wooden Aircraft Committee of the National Research Council.

Experiments were carried out on the development from Canadian materials of life-floats to replace those constructed of imported material.

A very large amount of work was performed in connection with war services and manufacturers on the design, testing, and specification of materials for containers for the shipment of war materials. These containers were of wood, corrugated board, fibreboard, and other materials. Of particular value in this work was the large 16-foot hazard machine in the laboratories.

Testing of samples submitted by the Department of National Defence and the Inspection Board of the United Kingdom and Canada has occupied an increasing proportion of the time of the staff. In addition, considerable testing was carried out for aircraft manufacturers, comprising tests on aircraft glues, metals, and components.

DIVISION OF LUMBER SEASONING

A study was made of the kiln-drying of eastern spruce in order to determine the best treatment to assure retention of the natural strength of the wood, which is a matter of particular importance in aircraft construction.

In the manufacture of aircraft the moisture content of wood parts is of the greatest importance. Assistance was rendered to aircraft plants in the conditioning of their plants so as to ensure reasonable uniformity of atmospheric conditions throughout the year. In addition a study was made of the effect of different storage conditions on aircraft plywood.

On account of a shortage of suitable air-seasoned material, an investigation was made of the kiln-drying of wood flooring blocks which were subsequently to be treated with creosote for floors in certain munitions plants. A large quantity of lumber treated with fire-retardants was kiln-dried for use in the construction of war vehicles.

In co-operation with a firm manufacturing rifles, a study was made of sugar maple and yellow birch to replace black walnut in gun furniture. Wooden blanks seasoned in the laboratories were forwarded for processing in the rifle plant.

Work was continued on the use of chemicals as an aid to seasoning difficult species and sizes; and air-seasoning studies of white pine were continued during the year.

DIVISION OF WOOD CHEMISTRY

In order to meet a demand for wood tar in the United Kingdom and domestic markets for the manufacture of tires, for the tarring of rope and oakum, and for other purposes, an investigation was carried out in co-operation with the Department of Trade and Commerce on the distillation of a suitable tar from Canadian woods. Work was conducted on red pine, jack pine, Douglas fir, ponderosa pine, and western larch.

In co-operation with the Department of National Defence an experiment was carried out on the acid-resistant treatment of maple battery boxes for tanks.

The laboratories co-operated with other authorities in an examination of the productive capacity of wood distillation plants and charcoal kilns for the production of unusually large quantities of charcoal required for special war purposes. A satisfactory solution was worked out.

Continued interest in the use of producer-gas to replace gasoline and diesel oil for the operation of internal combustion engines was manifested in the large number of requests which were received for information in this connection. Special interest was shown by pulp and paper companies, farmers operating tractors, and others operating where cheap wood is available.

Consideration was given to the problem of using large quantities of by-product sulphuric acid from certain war industries, in the production of alcohol from wood.

DIVISION OF TIMBER PATHOLOGY

In addition to fungi previously reported as actively destroying untreated jack pine railway ties, three other fungi causing serious decay have been identified. *Trametes americana* Overh. was found to have attacked approximately

45 per cent of the ties in an experimental track during a ten-years' service period. *Poria vulgaris* Fr. sensu Romell caused decay in 11 per cent of the ties; this fungus has not been reported frequently from Eastern Canada, but it has proved an important agent of destruction in the track. *Poria xantha* (Fr.) Lind was found to have completely destroyed one tie. A fourth fungus *Polyporus anceps* Peck was also identified among the fungi isolated from the ties, but was not associated with extensive decay.

Of 100 creosoted ties taken from the track, 15 yielded wood-destroying fungi. Of the fungi isolated *Lentinus lepideus* Fr. was the most active species in these ties.

Some 40 cultures of wood-destroying fungi were added to the collection.

The following wood-destroying fungi grown from spores collected from the air of a lumber yard were identified in culture: *Lenzites sæpiaria*, *Lenzites trabea*, and *Polyporus versicolor*. *Corticium coronilla* was also obtained. Many other spore cultures of Basidiomycetes from the air of the yards are retained for study.

Assistance was rendered to a pulp and paper company by studies made to determine the amount and distribution of bacterial infection in their plant. Based on the results of the study chemical treatment to eliminate "slime" was introduced into the mills. Subsequently, further studies were carried out to find out the effect of the treatment.

Tests were made for the Department of National Defence to determine the resistance to mould growth of glue and also of plywood for use in aeroplane construction.

DIVISION OF WOOD UTILIZATION

The laboratories co-operated with a Joint Committee of representatives of the lumber and pulp industries in finding practicable methods of using, for chemical pulp, about 400,000 cords of spruce sawmill waste destroyed yearly in refuse burners. Very encouraging progress was made in curtailing this waste. Several pulp companies are now using such material and others are experimenting with it.

Data obtained from previous studies of the cost of sawing spruce logs of different diameters were analysed. Although costs were found to vary widely from mill to mill, there is a general tendency for the costs of producing a given quantity of lumber from logs less than about 8 inches in diameter to increase sharply with decreasing size, but with logs over 8 inches the costs decrease relatively slowly with increasing diameter. Usually the amount of labour required to saw 1,000 board feet of lumber from 5-inch logs was found to be more than double that required to produce 1,000 board feet from 15-inch logs.

At the request of the Trade Promotion Committee of the Canadian Lumbermen's Association and with the support of the Governments of Quebec, New Brunswick, and Nova Scotia, and of lumber trade organizations in these provinces, the Forest Products Laboratories assisted in the formulation of grading rules for Eastern Canadian spruce lumber. To obtain the necessary data, field crews examined nearly 70,000 board feet of lumber at over a score of sawmills in the three provinces concerned. The field records are now being analysed in such a way as to ensure that the new grading rules will be soundly based on prevailing conditions and practices.

Investigations were carried out in connection with sources of supply and methods of production of woods used in the construction of aeroplanes. Assistance was rendered in formulating lumber specifications for military buildings; and a number of problems were dealt with pertaining to the use of wood in ship construction, the heating and insulating of military camps, and specifications for wood used in military equipment.

Exhibits of forest products were prepared for the New York World's Fair and for meetings of the Ontario Conservation and Reforestation Association.

DIVISION OF TIMBER PHYSICS

An extensive and detailed investigation was carried out of the density and general quality of spruce and balsam from a special area as compared with the average quality of these species in Eastern Canada. The timber in the area in question was found to contain very appreciable quantities of compression-wood which detracted from its value. The investigation showed the proportion of trees affected and the extent to which this character altered the wood from normal.

As compression-wood may often occur in large amounts in certain types of stand where trees are exposed to wind action, the commercial importance of this comparatively little known defect is becoming more widely recognized.

Assistance was rendered to the Royal Canadian Mounted Police in a smuggling case involving the proving that two pieces of timber found in different places originally were adjacent parts of the same board. The evidence provided was conclusive.

Identifications of wood samples of domestic and foreign origin were made on request of Government departments, users, and producers of timber. In some instances identification of pulpwood samples involved the examination of large amounts of material as in instances where it was necessary to determine the percentages of different species in shipments of mixed pulpwoods. It also included work on rifle furniture, field equipment, instruments, aeroplane plywoods, and other special products.

A shipment including various types of hickory was examined and recommendations were made to the Department of National Defence regarding specifications for different grades of handles.

In connection with the examination by microscope of glue bonds of synthetic resins, special methods were developed by the use of polarized light, as ordinary methods for animal and vegetable glues proved inadequate.

In co-operation with a firm of Canadian smoking pipe manufacturers, the possibility of using burls of birch and maple was investigated, also the roots of certain members of the heath family.

Studies were continued on the exudation of fluid resin through paint coatings on wood surfaces. The use of casein coatings on resinous woods gave promise of good results in controlling such exudation.

COMMITTEE WORK

Members of the staff of the laboratories served on the following Committees:—

The Canadian Engineering Standards Association.—Committees on Structural Timbers, Wooden Poles, Wooden Piling, and Fire Tests for Structural Materials.

The National Building Code.—Administrative Committee, Advisory Committee, Subcommittee on Wood Construction, Subcommittee on Fire Protection.

The National Research Council.—Aeronautical Research Committee; Subcommittee on Wooden Aircraft.

The Canadian Electrical Association.—Committee on Overhead Systems.

American Society for Testing Materials.—Subcommittee on Fibreboard and Fibreboard Containers.

The Canadian Pulp and Paper Association.—The Joint Committee of the Woodlands and Technical Sections; the Joint Administrative Committee of the Pulp and Paper Institute.

The Canadian Government Purchasing Standards Committee.—Subcommittees on Administration, Paint and Pigment Specifications, and Specifications for Chemicals.

PUBLICATIONS

Fire-retardant Paints.
Production of Charcoal.
Prevention of Checking in Air-seasoning Thick White Pine.
Forest Service Bulletin No. 94 "Density and Rate of Growth in the Spruces and Balsam Fir of Eastern Canada."
Some Problems of the Spruce Lumber Industry.

VANCOUVER LABORATORY

The normal work of this laboratory had to be greatly curtailed on account of the necessity of devoting attention to problems of immediate importance in supplying timber of suitable quality and manufacture for war equipment and construction.

The following are the more important matters which received attention:—

DIVISION OF TIMBER MECHANICS

Tests were carried out on yellow cedar which is used extensively in boat construction and on Douglas fir from a high altitude in order to find the effect of site on the mechanical properties of this species.

A special study was carried out to determine the effect of different temperatures and humidities in a dry-kiln on the mechanical properties of Sitka spruce for aeroplane construction.

Extensive tests were carried out on glued joints in timber and plywood, many of which were for the purpose of determining whether different commercial glues complied with specifications laid down by war services, particularly with respect to the strength of the bond and its resistance to deterioration in use under moist conditions.

Arrangements were completed to carry out a series of tests on air-dried Douglas fir and western hemlock timbers in three merchantable grades defined by the British Columbia Lumber and Shingle Manufacturers' Association Export Grading Rules, and in five different dimensions, from material selected from a number of producing areas in British Columbia. This involves the testing of more than 2,500 pieces of timber.

An officer of the laboratory co-operated with the office of the Timber Controller, with producers of spruce, and with manufacturers of aeroplanes in the interpretation of specifications for Sitka spruce and in settling special problems which give rise to a difference of opinion among interested parties.

Extensive tests were conducted on western white birch veneers and plywood with the result that it was accepted as an alternative species for yellow birch.

As a result of tests carried out on ten coldpress resin glues, six were accepted as conforming with Royal Canadian Air Force requirements and were admitted for use in aircraft.

An examination of the situation with respect to Engelmann and white spruce from interior British Columbia showed that appreciable quantities of a grade suitable for aircraft construction could be obtained as an alternative supply to Sitka spruce.

Attention was given to the suitability of yellow cedar for aeroplane propellers, as a substitute for mahogany in small boat construction, and for other special purposes, particular attention being paid to ways of using the lower grades.

Samples of arbutus stem, burl, and root burl sections and of western yew stem were submitted to a large smoking pipe manufacturer in England for test as a substitute for briar.

DIVISION OF TIMBER PRODUCTS

A study of the rate of moisture absorption in storage of red alder, broad-leaved maple, and western birch was brought to a conclusion. Assistance was provided a large furniture manufacturing firm in developing plans for proper manufacturing and storage to ensure satisfactory service of furniture, produced on the Coast, when it is shipped to areas in Canada where atmospheric humidity is materially lower than it is in British Columbia.

Data, based on studies made by the laboratory, were assembled for the British Columbia lumber industry, with regard to changes in moisture content, the effect of kiln-drying upon stain and decay in transit and other factors affecting lumber cargoes passing through tropical waters.

An investigation on the effect of the type of case (wooden or fibre) on the rusting of canned goods during ocean shipment, which has been carried on for some time in co-operation with the Research Committee of the Association of Marine Underwriters of British Columbia was completed.

Plans were prepared for a study of the rate of air-seasoning of true fir (Abies spp.), on account of growing preference for this lumber for certain uses.

A study of the rate of air-seasoning and the moisture gradient in Douglas fir and western hemlock ties was completed with a view to determining the most satisfactory method of preparing ties for creosote treatment.

Investigations for the purpose of developing drying schedules were carried out on (1) yellow cedar venetian blind bolts and slats; (2) Noble fir (*Abies nobilis*), for the construction of aeroplane screws; (3) western hemlock tea chest slats for the United Kingdom; (4) Douglas fir decking for pontoon bridges.

A study was completed to determine the effect of seasoning on Douglas fir timbers treated with zinc chloride, particularly as it affects shrinkage and distortion of preframed timbers when subjected to high atmospheric temperatures.

A study was undertaken to test the effect of prolonged bulk-piling upon urea-treated timbers, with a view to the possible use of this method in the shipment of timbers through tropical waters.

Assistance was given to two large factories, producing high-grade veneer from western birch for aeroplane purposes in determining the characteristics and properties of this wood.

Information was assembled on the effect of drying to a moisture content of 20 per cent on the development of stain in a consignment of western hemlock for the United Kingdom. Pathological studies were made of infected aspen logs which had been shipped to South Africa for cutting into match veneers, and of a shipment of aspen logs for China.

Attention was given to the durability of red alder when used for pit props in coal mines; to a comparison of the rot-resisting qualities of kiln-dried and green shingles; to the durability of kiln-dried material used in scow construction; to methods of protecting garden structures from rot; and to the cause of decay of poles in a power transmission line crossing a body of lava ash soil.

Wood specimens were examined to determine the extent and cause of decay, or to explain the reason for natural defects of an unusual nature. Of particular interest amongst these were: the cause of "white streak" in western birch; unusual defects in Sitka spruce; the cause of green stain frequently found in standing Douglas fir from certain sites.

Assistance was extended to the British Columbia Lumber and Shingle Manufacturers' Association in the revision of their grading rules for structural timbers.

COMMITTEE WORK

The British Columbia Lumber and Shingle Manufacturers Association—Grading Rules Committee.

Association of Marine Underwriters of British Columbia—Research Committee on Shipping Containers.

PUBLICATIONS

Forest Service Circular No. 57, "Sap-stain, Mould and Decay in Relation to Export Shipments of British Columbia Softwoods".

Factors Affecting the Drying of Lumber, Rough and Surfaced.

Some Technical Problems of War-time Lumber Supply.

THE PULP AND PAPER RESEARCH INSTITUTE OF CANADA, MONTREAL

For several years the Pulp and Paper Division of the Forest Products Laboratories has devoted attention to research and testing in the field of pulp and paper. During a large part of that time the laboratory has functioned through an agreement with the Canadian Pulp and Paper Association. Close collaboration was also maintained with McGill University.

On August 1, 1940, a new agreement came into effect between the Dominion Government, the Canadian Pulp and Paper Association, and McGill University, whereby the pulp and paper research work of the three bodies was placed under one director responsible to a Joint Administrative Committee consisting of representatives of the three interested bodies.

The research work carried out at the Institute is of two general types: fundamental and applied.

FUNDAMENTAL RESEARCH STUDIES

These are studies of a basic nature carried out with the object of extending scientific knowledge.

Among such problems undertaken during the past year a number dealt with the structure of lignin, one of the principal constituents of wood. This, it is hoped, will lead in the near future to applied research having as its objective the utilization of lignin.

New methods for the extraction of lignin from wood have been developed and an ethanol extraction method whereby 97 per cent of the lignin is removed, and which is applicable to the usual wood chips, holds promise of commercial application.

A new method for fractionation of high polymers, probably applicable to the fractionation of pulps, has been developed.

Considerable progress has been made on the hydrogenation of wood and lignin which is not only of interest in connection with the structure of lignin, but when carried out at lower temperatures offers a possibility for pulp recovery and lignin utilization.

The heats of adsorption of sulphur dioxide on wood at 90 degrees centigrade have been measured and equipment developed for measuring the heat of delignification during sulphite cooking.

A new technique has been developed for the measurement of the absolute surface of fibrous materials. The influence of beating and other factors on the specific surface of pulps is being studied.

Water vapour absorption measurements on pulp are being carried out at low temperatures. This work has for its objective an attempt to determine the shift in the relative amount of bound water with temperature. Specific heat measurements indicated that this is the case.

APPLIED RESEARCH STUDIES

A study is being made of the grinding process of making wood-pulp wherein a revolving grindstone breaks up the wood which is pressed against it into very small fibrous pieces. Thorough tests have been carried out to determine the influence on the quality of the pulp exerted by the character and speed of the stone surface, the grinding pressure, and other conditions of grinding.

The investigation of the quality of paper for purposes of printing was continued. In particular an attempt is being made to measure the quality of any given piece of printing. An effective set of equipment has been designed and assembled whereby the reflectance of a small enough area can be measured.

For the past few years, the manufacturers of box-board have been asking for some measure of its folding quality to guide them in making a satisfactory product economically. A folding tester has been designed and approved by several manufacturers. It will soon be constructed and tested under practical working conditions.

For years the industry has been hoping that a satisfactory method of determining the concentration of a pulp suspension would be found. Equipment has now been designed whereby it is hoped this measurement can be made by means of an electrical conductivity method. The construction of the apparatus is nearing completion.

A considerable amount of investigational work was carried out in connection with the yield and quality of woods from certain forest areas.

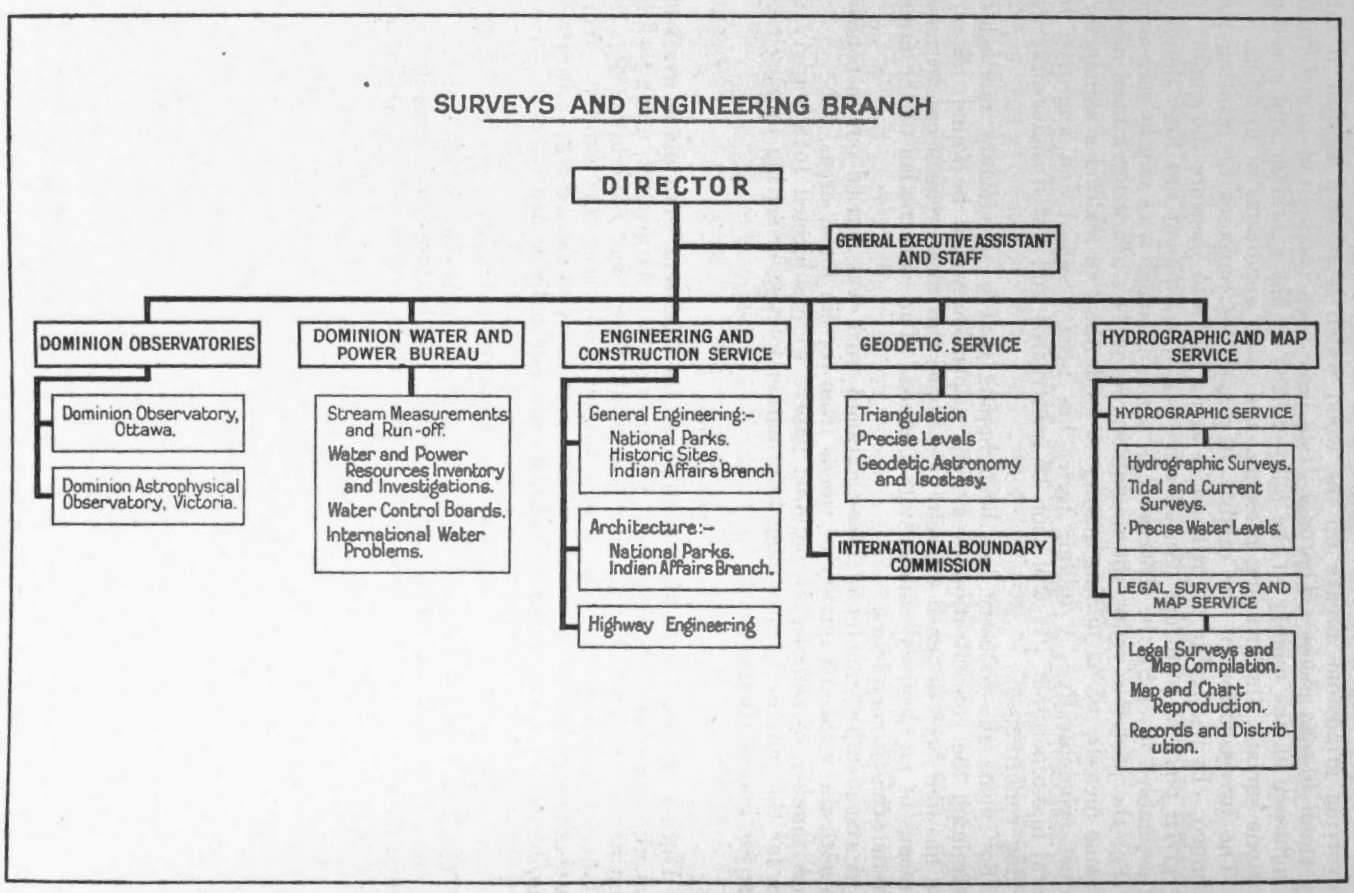
A number of samples of building papers were subjected to a variety of tests for the purpose of providing information for use in setting up specifications for building papers.

WAR WORK

During the past year the facilities of the Institute were made available for work connected with the present war emergency. As a result, much testing, scientific in character but of practical application, was undertaken for the Canadian Government and the various British Missions in this country. Work of a confidential nature in the national interest was also carried out, particularly in problems for which Institute facilities are especially suited.

INDUSTRIAL CO-OPERATION

The Institute co-operated with a number of companies in the solution of 857 minor technical problems. This included calibrations and inspections of standard testing apparatus and parts thereof which had been developed at the Institute.



Organization Chart, Surveys and Engineering Branch.

SURVEYS AND ENGINEERING BRANCH

J. M. WARDLE, DIRECTOR

During the year under review, the activities of this Branch have been consistently directed to the greatest extent possible towards assisting in work relative to Canada's war effort and to increasing the Branch's usefulness in this field. Opportunities for undertaking valuable war work developed in practically all Services, particularly in the fields of mapping and water power. While the normal work of certain Services has been curtailed, and in some cases deferred, it has been possible to devote staff and equipment to undertakings connected with the present emergency and in the case of some Services war requirements have greatly increased and made more urgent the work to be done.

The various Services making up the Surveys and Engineering Branch are the Dominion Observatories, the Dominion Water and Power Bureau, the Engineering and Construction Service, the Geodetic Service of Canada, the International Boundary Commission, and the Hydrographic and Map Service. Certain staff reductions have been made in order to reduce votes for non-war activities and in consequence senior officers and remaining members of the Services have had to assume additional work and responsibilities. Many of the normal activities of the Services mentioned are of direct and invaluable aid in the war effort and in other cases the work being done is of a maintenance character.

Work directly related to the war effort that was undertaken during the year by the Surveys and Engineering Branch included special hydrographic surveys and charts of certain ports and other important areas for the Naval Service; the compilation and printing of aeronautical maps and of maps for the Empire Air Training Scheme; the supplying of maps and survey data for use in special areas, and the making of special investigations for the National Defence Department (Army); the supplying of a large amount of miscellaneous information to the different Services of the National Defence and Munitions and Supply Departments.

Several members of the staff have enlisted for active service in the Naval, Military, and Air Forces. Others have been loaned to a number of the War Departments for essential war work and their duties have been allocated, as far as possible, to the remaining members of the staff in order to keep replacements to a minimum.

The basic activities of the Surveys and Engineering Branch are provided for in the votes of its several Services. In addition the Branch undertakes various engineering and construction work for other Government Branches or Departments with funds made available for the purpose. The following tables give the total expenditures made from the regular votes of the Branch and the expenditures made from funds made available by other Branches and Departments:—

Regular Votes	$ 1,114,434 35
Special Votes	402,196 37
Miscellaneous Votes	2,190 00
	$ 1,518,820 72

Expenditures of moneys made available by other Branches and Departments as follows:—

To Engineering and Construction Service from—

—	Regular Votes	Special Votes	Trust Fund	Total
	$	$	$	$
Lands, Parks and Forests	6,019 76	115,150 38	.....	121,170 14
Indian Affairs	45,379,99	162,537 11	1,060 75	208,977 85
	51,399,75	277,687 49	1,060 75	330,147 99

To Legal Surveys and Map Service from—

Indian Affairs	6,158 24	.....	.....	6,158 24
National Defence (Air)	.....	25,635 64	.....	25,635 64
	6,158 24	25,635 64	.....	31,793 88

To Geodetic Service from—

National Defence (Army)	.....	1,804 82	.....	1,804 82

To Hydrographic Service from—

National Defence (Navy)	.....	704 46	.....	704 46
Total Expenditure	.....	.....	.....	1,883,271 87

DOMINION OBSERVATORIES

The Dominion Observatories at Ottawa and Victoria continued their programs of work throughout the year, both programs being naturally affected by conditions arising from the War. In both institutions considerable attention has been paid to practical contributions towards Canada's war effort.

The Dominion Observatory at Ottawa undertakes work from both the practical and the research standpoint. Work along the latter channel often has a practical application of considerable value. The Ottawa Observatory is responsible for time observations and provides accurate time by wire and radio for the whole of Canada; its magnetic survey accumulates data on the declination of the compass and its rate of change, for surveys, navigation, and other purposes; seismology is applied to the study of rock bursts in mines, to effects of Canadian earthquakes and quake-resistant construction, and to methods of geophysical prospecting; and solar physics deals in part with the correlation of cycles of variation in solar radiation with weather conditions, and with fluctuations in animal and vegetable life. With these practical aspects are associated the measurement of star positions; problems connected with solar rotation, radiation, and wave-lengths; the paths followed by earthquake waves, and their bearing on the constitution and nature of the earth's crust; the laws governing terrestrial magnetism, gravity, and other associated problems.

The Dominion Astrophysical Observatory at Victoria is concerned mainly with research in astrophysics and allied sciences, comprising radial velocities of stars and orbits of spectroscopic binaries, studies of stellar spectra and problems connected with variable stars, the physical nature of novae, the rotation of the galaxy, the distribution of matter in interstellar space, and other astrophysical investigations.

In addition to its purely scientific program the Astrophysical Observatory has certain practical problems arising from the operation of its equipment, among these being the maintenance of the reflecting surfaces of the large mirrors of the telescopes. The Observatory staff has already constructed an aluminizing bell-jar with which the surfaces of mirrors 20 inches in diameter and under can be aluminized, and is at present engaged on the design of an aluminizing apparatus that will take the 72-inch mirror. It has been found that the life of an aluminized surface is many times greater than that of a silvered one, with the result that the Observatory Service staff has been aluminizing certain reflectors for the Naval Service.

During the year, the scientific world generally, and the Dominion Observatories particularly, suffered a great loss in the death of W. E. Harper, M.A., D.Sc., F.R.S.C., who passed away on June 4, 1940. Dr. Harper had been on the staff of the Victoria Observatory since 1919 and he had particularly applied himself to the determination of the radial velocities and the parallaxes of stars, and to the computation of the orbital elements of spectroscopic binaries. In these particular fields of research he was recognized as a leading authority, and in regard to the determination of star velocities takes his place among those scientists who have made the greatest contributions. In 1935 he became Head Astronomer of the Astrophysical Observatory at Victoria, succeeding Dr. J. S. Plaskett. Dr. Harper held this position until his death. He has been succeeded by J. A. Pearce, M.A., Ph.D., F.R.S.C., who has been long associated with the work of the Observatory, and is amply equipped in every way to continue the fine work done by the Victoria Observatory.

DOMINION OBSERVATORY, OTTAWA

Observing conditions throughout the year continued below normal. Satisfactory results were obtained in all classes of work undertaken although on account of staff reductions due to the war, observations with two of the five telescopes in use the previous year had to be curtailed. The photographic photometry work carried on with the 6-inch doublet was suspended, on the superannuation of the astronomer in charge, R. M. Motherwell, on June 21, 1940. Other reductions in staff, on account of superannuation, loans to war organizations, and enlistment, made necessary a curtailment of observations with the 15-inch equatorial telescope, the suspension throughout Canada of observations of gravitational values and their reduction, the curtailment of field observations and computations in terrestrial magnetism, and a reduction in constructional machine-shop work.

The Observatory was represented at the May, 1940, meeting of the Royal Society of Canada, and the following three papers were presented: "A Law of Variation in the Intensity of Light of any Wave-length Emitted from the Sun at Varying Angle from the Normal to the Surface", by Ralph E. DeLury; "Rock Burst Research at Lake Shore Mines", by E. A. Hodgson; and "The Saint Lawrence Earthquake of October 19, 1939", by Morris S. J. Innes. The latter two papers were also presented at the annual meeting of the Eastern Section of the Seismological Society of America held at Cincinnati, Ohio, May 31-June 1, 1940. Observations of the Perseid meteor showers were made from August 9 to 14 by twenty observers of the Ottawa Centre, Royal Astronomical Society of Canada, under the supervision of members of the Observatory staff and records of 1,371 meteors obtained, including 4 direct photographic plates and 5 with prism.

The Observatory was open to visitors each Saturday evening and the equatorial telescope made available on all clear nights. Numerous daytime visitors were instructed in the use of research equipment.

Position Astronomy and Time Service.—With the meridian circle 1,430 fundamental observations were made for right ascension and declination, and the computations continued.

Observations for correct time were made on 123 nights with a reversible transit. The two signal clocks, synchronized continually from one of the primary sidereal clocks, continued to control all mean time circuits, including the various time signals, circuits operating chronographs, minute and seconds dials, seismograph shutters, and the Government and outside clock systems.

Time signals were sent continuously by wire to the railway telegraph companies, the Canadian Broadcasting Corporation, and the Monitoring Station of the Department of Transport. The 1,000-cycle circuit from the Monitoring Station was calibrated by comparison with the primary clocks and relayed by wire to the National Research Laboratories. Wireless time signals were transmitted directly from the Observatory station CHU on 3330, 7335, and 14670 kc. continuously, also through station VAA on 11990 kc. daily except Sundays and holidays, and through the Canadian Broadcasting Corporation chain of stations daily. Correct time was also given to numerous telephone inquirers, with clock beats when requested. Wireless time signals were received daily from Arlington, Bordeaux, Monte Grande, Nauen, Rio de Janeiro, and Rugby, and comparisons forwarded monthly to other co-operating observatories. Experimental work with tube amplifiers, relays, and recorders was continued to provide further improvement in transmission and reception of time signals, time records of earthquake waves, and synchronizing of standard and secondary clocks. A new receiving unit was added to provide a check on signals broadcast through the Canadian Broadcasting Corporation network.

The synchronized time service of 700 electrically driven clocks in the various Government buildings in Ottawa was maintained with a minimum of interruptions. Clocks and other timing mechanisms were overhauled and rated for various Government departments.

Terrestrial Magnetism.—Field observations entailed the reoccupation of twelve repeat stations in Alberta, Saskatchewan, Ontario, Quebec, New Brunswick, Nova Scotia, and Prince Edward Island, and the establishment of one new station at Goldfields, Saskatchewan. Field instruments were compared twice with the Dominion Observatory standards at Long Island.

Index corrections of the compass of the standard Cooke Transit T. S. 1576 and of three compasses for use in Newfoundland were re-determined for the Hydrographic and Map Service and the Geodetic Service, respectively. Corrections for reducing inclination and total force of Dover dip circle T. S. 61, used by the British-Canadian Arctic Expedition, were redetermined for the Hydrographic and Map Service. A magnetic survey of the environs of the Service Depot of the Ontario Hughes-Owens Company in Ottawa was made in connection with the proposed establishment of a test room for marine and aircraft compasses.

The Hydrographic and Map Service was also supplied with general magnetic data and lines of annual change in declination for a revised magnetic map of Canada, and for the issue of a traffic chart of the Maritimes, Gulf, and Lower St. Lawrence. General data were also furnished to the International Union of Geodesy and Geophysics, the United States Coast and Geodetic Survey, the Department of National Defence, and on request to scientific organizations and surveyors.

Original formulæ were developed for deriving values of the amount and direction of secular variation by computation for magnetic stations where repeat observations have not been taken, provided that approximate values of declination and horizontal force are available.

The magnetic observatories at Agincourt, Ontario, and Meanook, Alberta, provided the usual continuous photographic records of the magnetic elements, horizontal force, vertical force, and declination, with only slight interruptions. Control was secured through absolute observations with precision instruments several times each week. The basement of the observatory at Meanook was enlarged to provide a permanent rigid foundation for the La Cour variometers to avoid sudden changes in base-line values due to the present temporary housing. Intercomparisons of the Meanook recorders and the Ottawa field instruments were made in July and August for re-determination of Meanook index corrections to conform with the International Magnetic Standard. Data from these two permanent magnetic observatories were sent on request to several research institutions and investigators in different countries. Preliminary computations and reductions have been completed to the end of 1940.

Co-operative research on magnetic activity, under the International Association of Terrestrial Magnetism, was commenced in January, 1940, to be carried on for at least three years.

Seismology.—The teleseismic seismographs at Victoria, Saskatoon, Toronto, Ottawa, Seven Falls, and Halifax, and the short-period seismographs at Kirkland Lake, Ottawa, Shawinigan Falls, and Seven Falls were maintained in continuous operation, and interpretation of records kept up to date.

Four hundred and eighty-seven earthquakes were recorded in Canada, seventeen of which were sufficiently well-defined for reports to the Press and to Science Service, Washington. All registrations were regularly reported to the principal seismological stations of the world through the usual medium of monthly bulletins. Reports on the two Quebec stations were made each month to the co-operating agency. Local registrations were reported as usual to the central station of the Northeastern Seismological Association at Weston, Mass.

The rockburst research at Lake Shore Mines, Kirkland Lake, Ontario, which was organized last year, has been continued. A well equipped electronics laboratory and workshop was installed by the mine and a program of operation established. Geophysical investigations were directed towards the determination and differentiation of vibration frequencies caused by rockbursts on the one hand, and by blasting or other mine disturbances on the other. There appear to be two frequency categories, over 200 cycles per second and below 100 respectively, and steps are being taken to equip a mine seismograph with a frequency filter so that only bursts will record, to provide a statistical study of rockburst activity. A hydraulic strain gauge was designed and operated in a particularly active section of the mine, and the records so far seem to indicate a distinct correlation between the gauge graph and bursts in that section. An electric strain gauge of unique design was developed at the Dominion Observatory and tested briefly at the mine; this promises to yield valuable results as soon as voltage fluctuations in the power-line have been eliminated. Attempts to measure variations in seismic velocities were unsuccessful to date. Other lines of research are under way, including means for registering supersonic vibrations, if these exist.

Gravity.—During April and May isostatic reductions and a table of principal facts were completed for nine stations established in 1939. Four maps were prepared from which it is possible to obtain by mere inspection, for any place in Canada, the effect on the gravity value due to topographical irregularities in that part of the earth's surface lying at a radial distance exceeding 550 miles from the place in question. Another map was prepared which shows for all of Canada the indirect effect on gravity by distant topography due tc the warping of the geoid, on the assumption of isostatic compensation. In June the gravity operations and investigations were suspended as a war measure.

Solar Physics.—Thirty solar photographs and 25 nine-strip solar spectrograms were obtained.

The measurements of the 1913 rotation spectrograms at λ5600 were revised for elimination of the micrometer oil error, and the 32 observations at nine position angles, equator to pole, completely recomputed using the Ottawa heliographic tables, the results being in good agreement with the new law of the solar rotation derived from the 1911 and 1912 observations. The 76 observations of these three years yield mean values for the nine latitudes within a few thousandths of a kilometre per second of the computed values from this law. Values of V_1 and V_2 for the ϕ_1 and ϕ_2 latitudes of each observation are being derived with the aid of this law, and the tabulated results typed for publication. Work was continued on the 1914 series.

The paper presented at the 1940 meetings of the Royal Society of Canada dealt with the $\cos^n\rho$'law of radiation intensity on the solar disc, found in a search for an explanation of the new rotation law. A possible explanation of the two laws was suggested, and a simple formula for the average intensity of the radiation from the whole disc derived as the centre intensity divided by $1+k/2\lambda$. (It has since been found that the $\cos^n\rho$'law was also discovered by Hertzsprung, The Netherlands, three years previously from different data yielding for k the value 0.27, as against the Dominion Observatory's value of 0.30 from Smithsonian Observatory observations.)

In relation to the muskrat farm being established in northern Saskatchewan, requested information concerning influences of the sunspot cycle was supplied, the Observatory's investigations of meteorological cycles and forms of life in that general region proving of value.

Fifteen-inch Equatorial.—Restricted observations were continued with the photo-electric photometer program which included observations on alpha Virginis, delta Cephei, and zeta Geminorum, and the usual preliminary reductions were made.

Photographic Photometry.—Observations with the photographic equatorial on Cepheid variable star fields and measurements of images with the Kipp photometer for the determination of magnitudes were continued up to the end of June when the work was suspended because of staff reduction as a war measure.

Publications, Reports, and Bulletins.—Nine numbers of the regular series of Publications of the Dominion Observatory were issued as follows: Vol. VI, "Spectroscopic Investigations of the Sun, Part II, Solar Rotation, Sections 1-3"; Vol. XI, No. 6, "Investigations of Gravitational and Magnetometric Methods of Geophysical Prospecting"; Vol. XI, No. 7, "Magnetic Results, 1927-1937"; and Vol. XIII, Bibliography of Seismology, Nos. 3, 4, 5, 6, 7, and 8. "Record of Observations at the Magnetic Observatories, Agincourt and Meanook 1931", was prepared and edited at the Dominion Observatory and published under the auspices of the Department of Transport; quarterly reports on the magnetic character of the day were made to the International Association of Terrestrial Magnetism and Electricity at Lausanne, Switzerland, and the Department of Terrestrial Magnetism, Carnegie Institution, Washington, D.C.; the mean values of the magnetic elements for 1941 were sent on request to the Greenwich Observatory for inclusion in the Observatories' Year Book; special reports were made to several research institutions and investigators in various countries; and the usual annual report on astronomy was made to the American Astronomical Society. The following bulletins, pamphlets, and brochures were issued: Wireless Time signals (monthly); Seismological Bulletin (monthly); Northeastern Seismological Association Bulletin (Nos. 41 to 64); Periodic reports to commercial companies co-operating in Seismological Research; Saturday Evening Program (quarterly); tables of sunrise and sunset, moonrise and moonset, phases of the moon, eclipses, and differences of standard time (on request); and reports on meteor observing, in which the Royal Astronomical Society of Canada, Ottawa Centre, participated, were made to Dr. P. M. Millman of the David Dunlap Observatory, Richmond Hill, Ontario, including observation results of Orion and Leonid showers in 1939, and the Perseid shower of 1940.

DOMINION ASTROPHYSICAL OBSERVATORY, VICTORIA, B.C.

The research work carried on by the Victoria Observatory was aided by improvements in equipment secured during the year, which have considerably enhanced observing facilities. A new type of instrument, known as an Intensitometer, was designed and constructed. This greatly facilitates the reduction of microphotometer tracings by automatically transforming the galvanometer deflections of the tracings into actual intensities. Extensive experiments were carried out and designs drawn up for the alteration of the stellar spectrograph to increase its dispersion by the use of a Littrow arrangement which makes it possible to convert the present 3-prism instrument into an effective 6-prism spectrograph, and also, if desired, to utilize the two gratings to good advantage. The electrical system of the stellar photometer was rebuilt to improve the insulation and shielding. In the machine shop a bench lathe, drill press, and bench grinder were installed with auxiliary tools.

Observing weather was two per cent below the average. The 72-inch reflecting telescope was in use on 188 nights, 1,105 spectrograms were secured in 1,223 observing hours, as compared with the 22-year average of 200 nights, 1,503 spectrograms in 1,240 hours. Because fainter stars are now being observed, fewer spectrograms than formerly are obtained. The output of the telescope will be materially increased when the proposed aluminizing equipment is provided.

The determination of radial velocities was the main research activity, for which 844 spectrograms were measured. Observing programs included the following: class B stars fainter than visual magnitude 7.5, north of the celestial equator; high temperature stars, for the study of interstellar calcium and sodium line intensities; selected R and N type stars; and spectroscopic binaries.

The systematic redetermination of the orbits of the B and A type stars for the detection of apsidal motion resulted in a fourth star being added to the three previously determined here. The analysis of the 83 spectrograms of the eclipsing variable TX Ursæ Majoris, secured over short periods at each of four different epochs during the past 15 years, clearly indicated that the line of apsides is advancing in a period of 35.6 ± 0.42 years.

Definitive orbital elements were derived for θ^2Tauri, H.D. 78316, and the two new binaries H.D. 207650 and H.D. 207826. The observations of the H.D. stars, 34762, 35715, 37043, 37756, 43246, 144208, and 193536 were virtually completed and the measurements of the plates well advanced. Many faint spectrographic binaries are being observed, and a number of long-period binaries and three-body systems are being followed periodically.

The analysis of the yearly velocity curves of the Pseudo-Cepheid star H.D. 199140 exhibits a "stand-still" on the descending branch at the point of maximum compression of the pulsating body. These departures from elliptical motion show that the star is not a spectrographic binary. The present observations extend over four years, and changes in the velocity curves from year to year are readily apparent.

Spectrophotometric studies of double-lined binaries have been continued, and a first paper giving the magnitude difference for 16 systems has been completed. A new program, embracing all suitable objects brighter than visual magnitude 7.51, has been initiated.

Tests made with the rebuilt stellar photometer on the eclipsing star W Ursæ Majoris show that the instrument now is adequate for the study of variables whose minima are as faint as visual magnitude 10.5. A new program of 300 stars selected for the determination of colour temperatures is in progress.

In the research on interstellar matter a number of unidentified interstellar lines observed with the Coudé spectrograph at the Mount Wilson Observatory have been correctly interpreted as due to the diatomic molecules of CH and CN. Thus, for the first time, the elements hydrogen, carbon, and nitrogen have been shown to be present in interstellar space. The data permit the computation of

the effective temperature of interstellar space as 1° absolute. An exhaustive search of the band spectrum analysis of some 30 diatomic molecules was made, and all lines arising from the lowest energy states were selected and collected into two tables. These tables give the wave-lengths of all lines due to diatomic molecules which might be present in interstellar space in detectable quantities.

In the faint N-type star WZ Cassiopeiæ, the resonance line of Lithium I at λ6708 has been photographed. This is the first time that this element, which is present as a faint line in the sun-spot spectrum, has been found in stellar spectra. Lithium must be especially abundant in this particular star, as a search of additional N-type stars has thus far failed to find another Lithium star.

Nine good spectrograms were secured of Comet Cunningham. The five Swan bands at λ4700 due to the molecule C_2 and the strong cyanogen bands at λ3885 show evidence of structure. Microphotometric tracings of the plates are being analyzed.

The transit of Mercury on November 12 was observed. With the aid of some members of the Victoria Centre, Royal Astronomical Society of Canada, twelve independent determinations of the second contact were obtained.

In the seismographic service, the seismographs were kept in operation. Approximately two hundred and sixty earthquakes were registered, and the records were forwarded to the Dominion Observatory, Ottawa.

Approximately 23,500 persons visited the institution during the year. As heretofore, two hours each Saturday evening were devoted to the observation of celestial objects, and more of the visitors are availing themselves of this opportunity than formerly.

Mr. W. H. Stilwell spent ten weeks assisting a coastal geodetic survey which was requested by the Department of National Defence; fifteen illustrated astronomical lectures were given to local armed forces; and a number of prismatic binoculars were adjusted for army officers.

Ten technical papers were presented before the American Astronomical Society and the American Association for the Advancement of Science, and 24 astronomical lectures were delivered. Two numbers of the Publications were printed and distributed: Vol. VII, No. 10, "Radial Velocities and Spectral Line Intensities for Iota Herculis," by R. M. Petrie and William Petrie; Vol. VII, No. 11, "The Spectrographic Orbital Elements of H.D. 23277," by R. M. Petrie.

DOMINION WATER AND POWER BUREAU

The Dominion Water and Power Bureau continued its work of collecting and recording data relative to the water and power resources of Canada. These resources are analysed by the Bureau in respect to their Provincial, Dominion and international aspects with the view of not only obtaining full information on water resources but also promoting water conservation and power development as a basis for the effective utilization of other natural resources. At the same time flow records and water levels provide invaluable information for irrigation development and for industrial and domestic requirements. Stream flow investigations were undertaken as in the past from coast to coast with the co-operation of the provinces, so that there would be no possibility of duplication in effort or expenditure on this work.

The purely Dominion field in regard to water and power work includes the Yukon and Northwest Territories, Indian Reserves, National Parks areas, and international streams. The administration of water resources in other areas is vested in the provinces and investigatory work for national purposes is carried on in co-operation with the respective provincial authorities.

District offices of the Bureau located at Vancouver, Calgary, Winnipeg, Ottawa, Montreal, and Halifax provide facilities for the efficient collection of information and for full co-operation with the provincial organizations.

On the outbreak of war the information available in the Dominion Water and Power Bureau on Canada's water resources was immediately sought by various departments who were concerned with water power from the industrial angle as well as that of protecting a vital industry. Up-to-date information on installed capacities of hydro-electric plants across Canada was promptly supplied in a special report, together with estimates of what additional installations might be made at existing plants and what new power sites could be most readily developed.

Plans showing the location of main plants and transmission lines were prepared for the protective services so that proper steps could be taken to prevent sabotage.

The Water and Power Bureau continued to give information on water and power matters where required in connection with Canada's war effort, and co-operated fully in this connection with the Department of Munitions and Supply.

In addition the Bureau gave technical advice to the Department of External Affairs on questions arising in boundary waters and one of the senior officers of the Bureau has been associated with the International Committee working on the St. Lawrence Waterways project.

Officers of the Bureau have also carried on their duties as members of the various International Boards of Control regulating the storage and flow of international waters

WATER AND POWER

Lake of the Woods Regulation.—During the year the run-off throughout the Lake of the Woods watershed was again below normal but the amount of storage in the reservoir was not materially reduced. Lake level was at elevation 1056.57 on April 1, 1940 and rose slowly to elevation 1057.75 on May 30. In view of the low run-off and the small amount of storage available the outflow was maintained at less than normal rates and lake level was steadily drawn down to elevation 1056.35 on March 31, 1941.

Lac Seul Regulation.—The actual regulation of Lac Seul remained under the control of the Hydro-Electric Power Commission of Ontario acting in co-operation with the Lake of the Woods Control Board. During the fiscal year the run-off from the watershed was considerably below normal. Lake level rose from elevation 1167·81 on April 1, 1940, to elevation 1169·44 on July 23, and was drawn down to elevation 1164·34 on March 31, 1941.

Snow Survey.—The thirteenth annual snow survey in Lake of the Woods and Lac Seul watersheds was carried out during the first week of March, in co-operation with the United States Engineer Office at Duluth, Minnesota and the Hydro-Electric Power Commission of Ontario. The results show that the water equivalent of the snow was 125 per cent of the average for the 13-year period.

Water Power Administration

The first water-power development to be constructed in the Northwest Territories was carried out during the year by the Consolidated Mining and Smelting Company of Canada, Limited, at the site known as Y_2 on the Yellowknife River. The interim licence authorizing the undertaking was issued on May 9, 1940 and steady power was being delivered to three gold mines in the Yellowknife area by the middle of January 1941. The principal works consist of a dam at the outlet of Bluefish Lake, a water conduit half a mile long, consisting of rock cut, tunnel, and wood-stave penstock with surge tank, the power-house on Prosperous Lake, and a 22-mile transmission line running south to the mines served. The power-house contains one 4,700-h.p. turbine operating under a normal head of 110 feet and connected to a 4,200 kv.a. generator.

In order to provide as rapidly as possible an adequate supply of power to meet the needs of war industries established in the vicinity of Calgary, the Calgary Power Company, Limited was authorized by an Order in Council under

the War Measures Act, dated December 13, 1940 to begin construction of a storage and power development in Banff National Park. The authority under which the power company began operations was of a temporary nature and required to be supplemented by an agreement between the Dominion Government and the Alberta Government approving the undertaking and providing for its completion and operation by licence under the Dominion Water Power Act, the agreement to be confirmed by concurrent legislation. An agreement between the two governments to give effect to these purposes was signed on March 28, 1941.

The principal works in this undertaking will consist of an earth-fill dam across the outlet of Lake Minnewanka to store a maximum of 200,000 acre-feet of water from the flow of the Cascade River and part of the flow of the Upper Ghost River, the latter to be diverted into Lake Minnewanka through Devil's Gap, under authority to be granted by the Province of Alberta; a canal and pipeline to take water from the lake to the power-house near Anthracite, from which the water will be discharged through a tailrace into the Cascade River; a transmission line to connect with the Company's main line at Seebe and a subsidiary line to connect with the system serving Banff and vicinity. The power plant will develop 23,000 horse-power under a head of about 325 feet. Work was begun early in January, 1941 and, aided by favourable weather, made rapid progress.

Water Power Exhibit at New York World's Fair

The Water Power Exhibit in the Canadian Pavilion at the New York World's Fair was reopened during the second year of the Fair. Certain changes effected during the winter months enhanced the attractiveness of the exhibit. An officer of the Bureau was in attendance from early in July, 1940 until the close of the Fair at the end of October. The illustrated publication "Canada's Water Power Wealth", referred to last year, was brought up-to-date and reprinted for distribution to those seeking specific information on the subject of Canadian water-power development and utilization.

Technical Assistance to Indian Affairs Branch

In accordance with applications filed under the British Columbia Water Rights Act, five conditional water licences were obtained for irrigation purposes to serve Douglas Lake Indian Reserve No. 3 in the Kamloops Agency, Okanagan Indian Reserve No. 10 in the Okanagan Agency, and Williams Lake Indian Reserve No. 1 in the Williams Lake Agency, and for irrigation and domestic purposes on Comox Indian Reserve No. 1 in the Cowichan Agency.

Nineteen final licences were obtained in confirmation of Indian rights to the use of water for irrigation, domestic, and other purposes serving two reserves in the Kamloops Agency, four each in the Lytton and Bella Coola Agencies, and one each in the Okanagan, Kootenay, and Upper Skeena Agencies.

National Water Resources Index-Inventory

The index-inventory system for collecting and recording of data relating to the water resources of the Dominion has been described in previous annual reports; work was continued during the year in the systematic collection and compilation of such data, with special attention being given to the relation of developed and undeveloped water-power resources to war requirements.

The Water-Power Resources of Canada

As of January 1, 1941 Canada's total hydraulic installation was 8,584,438 horse-power or upwards of 19·5 per cent of the present recorded water-power resources which, it is estimated, will provide for a commercial installation of 43,700,000 horse-power.

CENSUS OF THE CENTRAL ELECTRIC STATION INDUSTRY

Canada's central electric station industry—the production and distribution of all electricity purchased by the public for domestic, commercial, or industrial purposes—owes its outstanding position to the fortunate occurrence of dependable water-power sites. More than 98 per cent of all electricity sold is generated from water power and as the 1·8 per cent of the total power which is generated by the fuel power central stations is mainly distributed in communities of limited industrial operation, it follows that the electricity used for industrial power is practically 100 per cent water power.

Following the outbreak of war, the development of a large scale munitions industry has required that great efforts be made to ensure adequate supplies of power for manufacturing. Much was accomplished by the continuance of daylight saving throughout the winter months and by a curtailment of the use of electricity in electric steam-boilers, the latter alone resulting in diverting more than one and three-quarter billion kilowatt-hours to war-time industries during 1940.

DOMINION HYDROMETRIC SERVICE

For a number of years the Dominion Water and Power Bureau has carried on the work of securing and compiling stream measurement records throughout Canada under co-operative arrangements with the various provinces, and this service has been operated efficiently both as regards field operations and office administration. Records obtained in the field are brought together in one central agency, which undertakes the compilation and dissemination of stream flow data. The most important use of the records is in connection with water-power development and irrigation and water supply problems in general.

Run-off Conditions in Canada.—The average run-off for the fiscal year was generally below normal and few extremes of flow were recorded. In the Pacific drainage, typical stations showed a range in run-off from 81 per cent of the long term mean in the Kootenay River at Wardner to 113 per cent of the long term mean in the Bridge River in the central Fraser basin and in the North Thompson River at Barriere. In the Arctic and Western Hudson Bay drainage, typical stations showed a range in run-off from 8 per cent of the long term mean in the Makwa River in central northern Saskatchewan to 67 per cent of the long term mean in the Belly River at Mountain View in southwestern Alberta. In southern Saskatchewan, in the Mississippi drainage, the yearly run-off of Horse Creek near the International Boundary was 52 per cent of the long term mean. In the St. Lawrence and Southern Hudson Bay drainage, typical stations showed a range in run-off from 85 per cent of the long term mean in the North Maganatawan River near North Bay in northern Ontario to 138 per cent of the long term mean in the Grand River at Galt in southwestern Ontario. In the Atlantic drainage, typical stations showed a range in run-off from 88 per cent of the long term mean in the Lahave River at West Northfield in southwestern Nova Scotia to 101 per cent of the long term mean in the St. John River at Pokiok in central and northern New Brunswick.

POWER AND SPECIAL INVESTIGATIONS

In British Columbia, intensive studies were continued on the West arm of Kootenay Lake and on Kootenay River to its junction with the Columbia in connection with international problems and with the regulation of the level of Kootenay Lake in the interest of both water-power development and land reclamation. Slope studies were continued on Columbia River in the vicinity of the International Boundary to provide information for the safeguarding of Canadian interests from possible back-water effects from the operation of the

Grand Coulee Dam being constructed by United States authorities in the State of Washington. Close observation was continued of hydraulic and hydrometric conditions on Skagit River and Phillipps Creek, where international problems may become active. Engineering studies of importance were made for various Dominion Government Departments including hydrometric data on Vancouver Island streams for the Pacific Biological Station of the Department of Fisheries; irrigation problems at Kamloops and water supply at the Dominion Experimental Station at Windermere Creek for the Department of Agriculture and assistance to the Department of Public Works in a major hydraulic problem involving the development and maintenance of permanent ship channels in the Fraser River from the City of New Westminster to the sea. Engineers of the Bureau staff undertook for the Engineering and Construction Service of the Department supervision of construction of highway projects being built by the Province of British Columbia with Dominion assistance under the Tourist Highway Development program.

In Alberta the operation of Lake Minnewanka Storage Reservoir was undertaken during the filling season which commenced on May 12. The Fifth Annual Bow River Snow Survey in the vicinity of Lake Louise was carried out at the end of March and the Nineteenth Annual International Snow Survey on the Upper St. Mary River in Glacier National Park, Montana, was carried out early in May 1940 in co-operation with the United States Geological Survey. Extensive studies were carried out in the Milk and St. Mary River basins for the purpose of determining the natural flow of the St. Mary and Frenchman Rivers at the point where each stream crosses the International Boundary. Co-operation with the Calgary Power Company was continued in investigations connected with the future water storage and power possibilities on the upper reaches of the Bow River and its tributaries.

In Saskatchewan and Manitoba, continued attention was given to the Souris River problem which, during the year, was the subject of public hearings by the International Joint Commission.

In Ontario, in co-operation with the Department of Lands and Forests of the Province of Ontario and the Department of Mines and Natural Resources of the Province of Manitoba, further progress was made in the settlement of damage and easement cases along Winnipeg River in Ontario, where properties had been damaged by high water conditions in 1927 and 1938 as a result of the regulation of Lake of the Woods. On Niagara River, studies were continued throughout the year with respect to river slopes and discharge and attention was also given to certain revisions in the ratings of power stations on the Canadian side of the river for the information of the International Niagara Board of Control. In anticipation of possible flood prevention measures on Thames River, special attention was again given to flow conditions during the freshet season. Special investigations of hydraulic conditions on South Nation River were repeated during the freshet period of 1940 at the request of the Department of Public Works and preparations were made for similar investigations during the flood season of 1941. Snow surveys were again undertaken for the Hydro-Electric Power Commission of Ontario in the watersheds of Wanapitei, Sturgeon, South, and Muskoka Rivers. A member of the Ontario District staff was sent to Denver for several weeks to act as Canadian representative in connection with model tests made by the United States Bureau of Reclamation in respect to an international problem on the Columbia River resulting from the construction of the Grand Coulee Dam.

In Quebec, special hydraulic investigations of the Lower Yamaska River were made at the request of the Department of Public Works in connection with flood prevention measures. Other special studies included investigations of backwater effect; metering and rating outflow of storage reservoirs; maintaining special gauges on Richelieu River in connection with international matters; and checking of power-station ratings in co-operation with various power organizations.

In New Brunswick an investigation was made of the international reach of St. Croix River in September and a report was prepared for the International St. Croix Board of Control covering conditions during the 1940 season.

In Nova Scotia, power investigations were made of Gold and Nictaux Rivers and inspections were carried out in connection with the diversion works of the Nova Scotia Power Commission on St. Margaret Bay Lake. Efficiency tests were also made at the Commission's new hydro-electric plant at Barrie Brook.

INTERNATIONAL WATERWAY MATTERS

Most of the International Boundary between Canada and the United States lies through or is traversed by lakes and rivers which, in consequence, are international waters. Questions arise from time to time with respect to these waters and records of flow, levels, etc., are required for their decision. In this connection the governments of the two countries have agreed to the establishment and operation of joint international gauging stations in these waters. The officers of this Bureau and of the United States Geological Survey visit these stations and agree upon the accuracy of the records secured which, thereupon, become equally acceptable to both countries in dealing with any problem affecting these waters; most of these stations are in the West. There are in all sixty such stations, and there are five others maintained on international waters by Canada. In addition to these there are eighty-one stations maintained on Canadian streams which are tributary to international waters. These furnish data of value in dealing with international waterway matters.

Among the more important matters dealt with during the year were:—

The Convention between Canada and the United States, providing for emergency regulation of the level of Rainy Lake and of the level of other boundary waters in the Rainy Lake watershed, signed at Ottawa, September 15, 1938, came into effect on October 3, 1940, and attention was given to the problems arising therefrom.

Hydrometric records of the Roseau River in Manitoba and its tributaries were secured in connection with the international problem on this river.

Throughout the year Bureau officials were closely associated with the international and domestic negotiations leading up to and following the signing of the Canada-United States Agreement of March 19, 1941, relating to the Great Lakes-St. Lawrence Basin Development.

Attention was also given to international problems which arose in the Columbia-Kootenay River basin during the year. Field investigations and office studies were made and submissions were presented to the International Joint Commission in connection with hydraulic problems which arose in the reclamation area of Kootenay Flats. Similar action was taken and is continuing with respect to the application of the United States Government to the Commission for approval of the construction and operation of the Grand Coulee Dam and Reservoir. Bureau and United States engineers continued joint studies of hydraulic conditions of the Kootenay River.

Following the receipt of a petition from the South Alberta Water Conservation Council praying the more beneficial use of the waters of the St. Mary and Milk Rivers, the Government, by Order in Council P.C. 682, set up the St. Mary and Milk Rivers Water Development Committee to make a thorough study of the better utilization of these waters. The Controller of this Bureau is Chairman of this Committee.

The International Committee of Engineers, of which the Controller of the Bureau was Chairman of the Canadian Section, held several meetings in the preparation and compilation of the factual data in connection with the international problem on the Souris River referred by the Governments of Canada and the United States to the International Joint Commission for investigation and report.

The Committee appeared before the Commission at their several meetings and submitted recommendations.

The International Joint Commission recommended the formation of a joint board of engineers, to be known as the International Souris River Board of Control, to continue the investigation. The Controller of the Bureau has been appointed the Canadian representative on this Board.

International Waterway Boards which functioned as in previous years, were, The International St. Croix River Board of Control, 1917; The International Lake Champlain Board of Control, 1937; The International Massena Board of Control, 1923; The International Niagara Board of Control, 1923; The International Lake Superior Board of Control, 1915; The International Prairie Portage Board of Control, 1939; The International Lake of the Woods Control Board, 1926; The International St. Mary and Milk Rivers Board of Control, 1921; The International Kootenay Lake Board of Control, 1939.

REVENUE

During the year contributions in support of the co-operative water resources studies were received from the provinces to the amount of $31,073. Payments in connection with capital and operating costs of Lake of the Woods and Lac Seul storage, as provided under the Natural Resources Transfer Agreement, were received from the Province of Manitoba in the amount of $88,940 and revenue from water power licences, etc., to the extent of $1,076 was also collected. In addition the sum of $3,500 in connection with a water-power licence on Bow River, was received on behalf of and remitted to the Indian Affairs Branch.

PUBLICATIONS

During the year Water Resources Paper No. 76 dealing with the surface water supply of Ontario and Quebec from October 1, 1933 to September 30, 1935, and No. 81 for New Brunswick, Nova Scotia and Prince Edward Island from October 1, 1934, to September 30, 1936, were published. Water Resources Paper No. 80 covering the Pacific Drainage in British Columbia and the Yukon Territory from October 1, 1934, to September 30, 1936, was in press at the end of the year. The regular annual bulletins on Hydro-Electric Progress in Canada during 1940 and the Water Power Resources of Canada, 1941, were issued as usual.

ENGINEERING AND CONSTRUCTION SERVICE

The Engineering and Construction Service acts as a general engineering unit to the various Branches of the Department of Mines and Resources, its work includes the preparation of plans, specifications, and estimates covering highway and other forms of construction, and the preparation of designs and plans of architectural work. In addition, it acts in an advisory capacity on engineering matters.

While the construction activities of this Service since war began have been reduced because of curtailment of funds for ordinary works, there have been corresponding substantial staff reductions. It has been necessary in view of the limited number of engineers now available for field work, to plan the latter carefully so that supervision facilities can be utilized to the best advantage.

The functions of the Engineering and Construction Service in peace-time have proved to be a valuable training field for the type of specialized experience required for duties and works under the present war conditions. In addition to direct assistance given to war services at headquarters, technical officers have been loaned for temporary work, and others seconded for required periods or the duration. Many of the peace-time staff are also rendering most useful service in technical capacities on various war projects across Canada. Heavy construction equipment has also been made temporarily available for work on airfields in Alberta.

A description of the more important construction and maintenance projects undertaken by this Service in the year under review is given hereunder.

HIGHWAYS

Golden-Revelstoke Highway

The highway connection between Golden and Revelstoke, 193 miles long, following the "Big Bend" of the Columbia River in British Columbia, was started in 1929 by the Dominion under an arrangement with the Province, whereby the Dominion was to construct the easterly section and the Province the westerly section, working simultaneously. Later, when it developed that the Province was unable to carry out its part of the program in the time agreed upon, the Dominion undertook to complete the project. In December, 1937, the easterly section was completed and turned over to the Province. Work on the westerly section was continued by Dominion forces, major grading operations being completed during the 1939 season. In 1940, further work was done in reshaping the road section after the winter months, repairing settlement of large fills, clearing spring slides, and surfacing the new sections of road with gravel. Dust laying oil was also spread on some 32 miles. With the completion of this work, the Dominion responsibility in regard to the highway ended, and on June 29, 1940, the westerly section was turned over to the Province of British Columbia for further administration and maintenance. On the same date all that section of the Trans-Canada Highway between Golden and Revelstoke was officially opened for public travel.

The total length of the Golden-Revelstoke highway is 192·6 miles of which 186 miles were constructed by the Dominion. Expenditure on the project by the Dominion through the Department of Mines and Resources totalled $3,304,-833.63.

Cabot Trail, Cape Breton Highlands National Park

The northern section of the Cabot Trail is located for the greater part in Cape Breton Highlands National Park. Following the establishment of the park in 1936, a program was undertaken for the improvement, reconstruction, and relocation of sections of the road, the latter work lying particularly along the difficult westerly coast where it was necessary to reduce grades and provide better alignment.

Under this program, during 1940, construction work was continued on the Jumping Brook-Mackenzie Mountain-French Mountain section of the highway. All work under this contract, which was awarded during 1939, was completed, covering approximately 8½ miles.

Most of this work was carried out in very difficult country, involving heavy rock and earth grading. Three treated timber trestle bridges were erected, of 9, 10, and 11 bents respectively. All these bridges were designed for erection on horizontal curves with suitable super-elevation.

Entrance Highways from International Boundary and Main Tourist Highways

KINGSGATE-KOOTENAY PARK HIGHWAY

In 1936 an agreement was completed between the Province of British Columbia and the Dominion, providing for the improvement and hard-surfacing of the main tourist route from Kingsgate on the International Boundary to the southern entrance of Kootenay National Park. Under this agreement the Dominion contributed to improvement and paving work, as undertaken by the Province and approved by the Dominion, to the extent of 50 per cent of the cost of such work, but not exceeding $500,000 over a three-year period. As the original agreement expired before all work on the highway was completed, a

further agreement was entered into in July, 1939, providing that work should be completed before March 31, 1941,—the total contribution of the Dominion over the period of the latter agreement not to exceed $300,000. During the 1939 season, the Dominion's contribution was limited to $190,000. This full amount was earned and paid to the Province. In the 1940 season all remaining work provided for under the agreement was completed with the exception of certain seal-coating and guardrail which had to be postponed in view of climatic conditions. Periodic inspections were made by engineers of this Service to see that the work was done in accordance with plans and specifications, and claims for repayment of the Dominion's contribution were examined and certificates covering such payments issued.

During the 1940 season, final regrading of certain improved sections was done, and 19·9 miles of bituminous pavement were laid. In addition 78·3 miles of seal-coating were applied.

The following amounts have been contributed by the Dominion under the two Agreements:

1936-37	$ 92,877 25
1937-38	136,416 59
1938-39	174,845 14
1939-40	190,000 00
1940-41	96,977 08
Total	$691,116 06

TOURIST HIGHWAYS

The Engineering and Construction Service in 1940-41 was responsible for the administration of Dominion contributions towards development of Tourist Highways in the Provinces of British Columbia and Manitoba. The work in each province was covered by an agreement between the Dominion and the province, and covered certain construction items which were calculated to tend to develop tourist traffic, as well as to alleviate unemployment conditions. Under these agreements, the Dominion contributed 50 per cent of the total provincial expenditure, as approved by the Dominion up to a stated maximum for each province. The agreements stipulated that a stated percentage of employment was to be given to needy cases, including those in receipt of relief. All claims for payment of the Dominion's share of the expenditures were examined, checked, and the necessary certificates issued by this Service.

The following tables show the employment afforded, as well as the maximum allotment and total payment made to each province:

Tourist Roads 1940-41

MAN-DAYS WORKED

—	Relief and Needy Man-days	Total Man-days
British Columbia	2,796	6,914
Manitoba	5,586	9,807
	8,382	16,721

ALLOTMENTS AND PAYMENTS

—	Maximum Dominion Allotment	Payments by Dominion
	$	$
British Columbia	93,000 00	85,964 40
Manitoba	155,000 00	154,919 41

SUMMARY OF WORK ACCOMPLISHED BY PROVINCES, TOURIST HIGHWAY PROGRAM 1940-41

British Columbia.—Work on the construction of an up to date, two lane Provincial highway, with wide shoulders, known as the Peace Arch Extension, north from Blaine at the International Boundary towards New Westminster, was started in 1938 with Dominion assistance, continued in 1939 and finally surfaced with asphalt mulch and seal-coated during 1940. The Dominion contributed to the cost in each of the three fiscal years 1938-39, 1939-40, and 1940-41.

During the fiscal year 1940-41, certain drainage works were also constructed by day labour and the following items were completed by contract: 15·42 miles of shoulders finished, gravelled, and rolled; 15·42 miles of plant mix asphalt mulch laid to widths of 22 and 33 feet; 15·42 miles of asphalt seal-coat placed over the mulch.

In commemoration of the visit of His Majesty King George VI to British Columbia, this main tourist route north from the International Boundary was renamed the King George VI Highway. It is an extension of United States Route 99, and was officially opened to traffic by the Hon. Ian Mackenzie, on October 10, 1940, at a public ceremony held in the Peace Arch Park.

There are a few small items of work still to be completed during the 1941-42 fiscal year, which include oiling the shoulders.

Manitoba.—Three projects were undertaken in Manitoba, consisting of work in connection with hard asphalt surfacing of two main trunk highways, one project from Portage to Sydney, and two on Provincial Trunk Highway No. 10 running north from Brandon to Riding Mountain National Park.

The following items of work were completed: Portage to Sydney—37·4 miles grade stabilization improvement; 37·4 miles asphalt mulch surfacing (plant mix) 22 feet wide; 37·4 miles seal-coat application. All intersections along this section were gravelled.

P.T.H. No. 10—Brandon north to Riding Mountain Park:—6 miles asphalt road mix, 22 feet wide; 16·2 miles road mix, half mat treatment 22 feet wide; 10 miles seal-coat on 1939 mulch, 22 feet wide; 6 miles seal-coat on 1940 road mix; 12·8 miles gravel spread in windrows along highway and partly stockpiled in pit for curves; ready for mulch treatment in 1941.

The highway between Portage la Prairie and Sydney is a section of a Trans-Canada route from Winnipeg westerly towards Brandon. Provincial Trunk Highway No. 10 runs northerly from the City of Brandon to and through Riding Mountain National Park. These two highways carry heavy summer tourist traffic, which will greatly benefit from the improvement work done.

GOLDEN-LEANCHOIL HIGHWAY

The Golden-Leanchoil road is part of a Trans-Canada route through the Rocky Mountains, and is a particularly spectacular section. It was constructed by the Province several years ago, connecting up the highway through Yoho National Park with the Columbia Valley road at Golden. The later construction

of a connecting link, between Golden and Revelstoke, following the Columbia River via the "Big Bend", completed the east to west crossing of British Columbia by the Trans-Canada Highway. The Golden-Leanchoil section throughout practically its entire length runs along the steep mountain slopes above the Kicking Horse River. As originally constructed, the road was quite narrow in many places, and at several points had sharp and dangerous curves. In view of its increasing importance as a tourist and transcontinental artery, improvement of the road had become imperative. Accordingly, an arrangement with the Province of British Columbia was reached, whereby some improvement work was undertaken by the Engineering and Construction Service during the winter months in 1940, in co-operation with the Province.

Subsequently, under a further arrangement with the Province of British Columbia, certain widening and improvement work was carried out on sections of the road, during the winter of 1941. This arrangement provided that expenditures in connection with the work be shared equally between the Dominion and the Province, each of whom furnished suitable available equipment from its stocks. Work was carried on by day labour under the Engineering and Construction Service. In general, the work consisted in widening certain narrow sections of roadway to a minimum width of 24 feet along rocky side-hills, and making certain revisions that would greatly improve general alignment. The total estimated quantity of material moved was 80,000 cubic yards. In addition, some 6,000 cubic yards of gravel were placed on sections of widened or revised roadway.

ENGINEERING WORK IN NATIONAL PARKS

Banff National Park

Trans-Canada Highway (Lake Louise East Section).—Parapet walls of the new steel and concrete bridge over Johnson Creek were completed. A new steel and concrete bridge on new alignment was constructed over Corral Creek, and the old timber truss bridge at this point dismantled. The section of road between Mile 25 and Lake Louise Station, Mile 36, was worked on, side-hills excavated, settled embankments brought up, slides removed, culverts installed, and roads surface oiled so that both newly graded and old sections were put in condition for tourist travel.

A survey was made of a proposed revision of the crossing over the Pipestone River, and plans and profiles of same prepared.

Lake Minnewanka Development.—When the Calgary Power Company commenced field operations in connection with the development of increased storage at Lake Minnewanka and the power plant near Anthracite, an engineer acted as departmental representative on the ground. Frequent inspections were made of work in progress and consultations relating thereto held with Company officials.

Conferences were also held and reports and statements prepared concerning the valuation of the Banff electrical system.

In connection with traffic regulations, an engineer attended conferences with Parks officials.

Conferences and discussions were held and inspections of highways made regarding the suitability of park roads for the operation of standard buses. Estimates were prepared covering improvements required to highways in this connection.

Jasper National Park

Jasper Park Lodge Road Diversion.—The west approaches to the new steel bridge over Athabaska River near Jasper were constructed, and the connecting road between the bridge and the Maligne Canyon road, approximately nine-tenths of a mile, completed. The entire revision was treated with dust-laying oil.

Athabaska River Bridge, Mile 12·2, Jasper-Edmonton Highway.—At the beginning of the season an examination of this structure was made and tie rods were tightened, bridge flooring repaired, and the bridge put in as good condition as possible for the season's traffic.

Information was assembled relative to the replacement of the 225-foot timber span over the main channel of Athabaska River. Specifications, contract forms, and information for bidders were prepared. Calls for tenders were issued and tenders examined covering the dismantling of the existing 225-foot timber truss and its replacement with a suitable steel span. A contract was awarded to the Dominion Bridge Company.

Waterton Lakes National Park

Chief Mountain Highway.—Owing to the failure of the paving contractor to resume operations during the year on the above highway, the Department, under the terms of the contract, completed by day labour seal coating of mulch pavement laid the previous year, a total of 14·7 miles.

Pass Creek Bridge.—Investigations were made of various sites for a new bridge to replace the existing timber truss span over the Pass Creek on the main entrance road. A report was prepared with estimates of cost for various proposals.

Kootenay National Park

Banff-Windermere Highway.—An inspection of all bridges and culverts on the Banff-Windermere Highway was made to determine the carrying capacity of these structures. A short revision was made in the road location near Radium Hot Springs by cutting into the steep side-hill bank to repair a damaged section, thus eliminating the necessity of a crib. Levels were given and supervision provided for the installation of new culverts on this road. Several small revisions were included in this work. Advice and supervision were also provided in connection with the extension of the intake pipe for the Radium Hot Springs water supply.

Riding Mountain National Park

Wasagaming Drive.—Seal coating was completed, under contract, of the hard-surfacing laid the previous season, 4·3 miles.

Prince Edward Island National Park

Golf Club-house and Storehouse.—Construction of these two buildings, started the previous year under contract, was completed early in the season.

Cape Breton Highlands National Park

Cabot Trail Highway—Investigations were made of bridge sites for four truss bridges and one trestle bridge, on the location for proposed new route of a section of this highway on the east coast. Preliminary stress diagrams and drawings of these bridges were prepared.

General

Inspections were carried out of bridge structures in Banff, Jasper, Kootenay, Yoho, Waterton Lakes, Prince Albert, and Riding Mountain National Parks. Reports were prepared covering present condition of all structures inspected, with recommendations for necessary repairs or replacement.

ENGINEERING WORK ON INDIAN RESERVES

BUILDING CONSTRUCTION

In British Columbia construction of Alberni residential school to accommodate 200 pupils, and of a four-room day-school with machine shop to accom-

modate 160 pupils, which was started during the previous year, was completed by contract. Plans and specifications were prepared for the conversion of Coqualeetza residential school for use as a hospital. Alterations were carried out by contract. By the end of the year most of the contract work was completed and equipment installed.

In Saskatchewan alterations were carried out to toilet facilities, plumbing, sewer, and heating systems at Round Lake residential school.

IRRIGATION

Improvement and repairs were made to irrigation systems on the St. George's, Lytton, St. Mary's No. 1, Shuswap No. 1, Deadman Creek No. 1, Kamloops No. 1, and Soda Creek No. 2 Reserves in British Columbia.

WATER SUPPLY AND SEWER SYSTEMS

In British Columbia, improvements were made to the domestic water supply systems at Kitimat, Sliammon, Port Simpson, and Kitsegukla Indian Villages and in Comox No. 1, Tsitsk No. 3, and Anaham No. 1 Indian Reserves; and to the septic tank and sewage disposal works at Lejac Indian school. In Saskatchewan repairs were made to the sewage system and pipe-line at Gordon's residential school and to the water supply system at the Farm Instructor's residence on Kahkewistahaw Indian Reserve. In Manitoba a new water supply system was provided for the Brandon residential school and at Norway House Agency changes and alterations were made in connection with the operations and control of the lighting plant. The power-house was moved to a new site, engine bases constructed, pump installed, engines set up and connected, transmission lines erected, and chlorinator installed. The existing water supply mains were examined and the intake supply line extended.

In Ontario repairs were made to water supply and sewage systems, at Cecilia Jeffrey Indian school and to sewage system at Kenora residential school. Surveys were undertaken and a start made cleaning out sections of Suzanne River to prevent flooding in Caughnawaga Indian Reserve in Quebec.

In British Columbia inspections and surveys were made of storage works on Deadman Creek No. 1 and Williams Lake No. 1 Reserves; of irrigation systems on Kootenay No. 1, Shuswap No. 1, Soda Creek No. 2, and Cook's Ferry No. 2 Reserves; of water supply systems on Musqueam No. 2 Reserve, Sechelt Indian Village, and Saanich Nos. 1, 2, 3 and 4 Reserves; of storage site at Minnie Lake, Upper Nicola Reserves and a conference was held with provincial authorities in this connection. A hearing was held on an application of the Department for a water licence on Okanagan No. 1 (Deep Creek) Reserve. Some river protection work was constructed on Upper Similkameen No. 4 Reserve. A survey was made of certain lands on Adam's Lake No. 4 Reserve and inspections were made of the electrical plant at Kootenay Reserve residential school, of the heating and water supply systems at St. Catherine's school, of the Alert Bay school, and of the Puntledge River bank on Puntledge No. 2 Reserve.

In Alberta an inspection was made of the power plant at Brocket in the Peigan Agency.

In Saskatchewan inspections were made of the sewage disposal system at Gordon's school, of plumbing and heating systems in Round Lake school, and of water supply possibilities on Kahkewistahaw Reserve.

In Ontario inspections were made of the agency building, the water supply system, and scow ferries at Walpole Island; of the Council Hall on Muncey Reserve; of the wharf site—and subsequent work on the wharf—at Cedar Point in Christian Island Agency; and of No. 3 Day School in the Six Nations Reserve. A survey was undertaken of sub-surface drainage for Kenora residential school.

In Quebec an inspection was made of drains on the Caughnawaga Reserve; an investigation for a drainage ditch and water supply at Pointe Bleue Agency, and a valuation was made of the water supply system of the village of Lorette on Lorette Reserve.

In Nova Scotia an inspection was made of protection work on the Middle River Reserve.

GEODETIC SERVICE OF CANADA

Co-operation in Canada's war effort marked the activities of the Geodetic Service during the year. A number of geodetic engineers enlisted for active service and others were loaned to branches and departments in connection with war service.

In response to requests from the Department of National Defence, investigations were made by engineers of this Service in the conditions of refraction in certain coastal areas. Geodetic determinations of geographic positions were made available for naval charts and military and aerial navigation maps. Control data were furnished in response to continued requests from surveying and engineering organizations throughout Canada.

Extensive data prepared by this Service are available for use in international undertakings such as the St. Lawrence waterway development.

The precision attained by the Geodetic Service for control data in surveying, engineering, and mapping is the result of employing correct methods, proper equipment, and trained engineers. As the surface of the earth is spheroidal, it is necessary to use spheroidal methods of reduction. The spheroid used in Canada, United States, and Mexico is known as Clarke's spheroid of 1866, and was adopted jointly by the geodetic organizations of these countries in 1913. Mean sea-level is the datum to which precise levelling operations are referred. The routine work of this Service comprises geodetic triangulation, precise levelling, geodetic astronomy and base line measurement, triangulation adjustment, precise levelling adjustment, and the publication of the resulting mathematical data. Mathematical research in geodesy is carried on and advantage is taken of the opportunity of securing results in the scientific study of isostasy, to determine the elevation of the geoid in Canada.

TRIANGULATION

Newfoundland.—Field parties were organized in May and the first part of June, 1940. The men and their equipment were distributed to their stations, the accessibility of which was difficult in some cases. Two stations were prepared for observing, one station was partially completed for angular measurements, one Laplace station near Corner Brook was finished, and the base line at Parson's Pond was partially prepared for measurement. The completion of the triangulation of the Geodetic Survey of Newfoundland will require one season's operations, before the publication of the mathematical data can be carried out.

Gulf of St. Lawrence.—On the resumption of the triangulation along the north shore of the Gulf of St. Lawrence, which had been discontinued in 1925, it was first necessary to revise the reconnaissance in a few places and to prepare sufficient stations so that angular measurements could be made the following season. Accordingly in 1940 the party was organized with an engineer and assistant, together with a station preparation party.

Work started near Baie Johan Betz on the north shore and proceeded eastward, terminating for the season near Muskwaro, about 30 miles east of Natashkwan. With the exception of two stations on the coast of Anticosti Island, all stations were close to, or a short distance inland from, the north shore. The average length of line was about 10 miles. Eighteen stations were prepared for observing and five stations in the same area had to be left until the following season.

A proposed base line near Natashkwan was thoroughly examined, and it was found to be impracticable to measure it successfully, so a new site in the same neighborhood was selected. The engineer in charge also selected a base line site 300 miles further east near Bradore Bay at the southwesterly end of the Strait of Belle Isle. This base line was later measured by the party which had been working in Newfoundland.

British Columbia Coast.—On the British Columbia Coast three operations were undertaken. In the spring and autumn investigations into coefficients of refraction were undertaken in the Victoria, B.C. area for the Department of National Defence. The secondary triangulation in two areas in the vicinity of Queen Charlotte Sound was required because primary stations in those areas were rather inaccessible, and more conveniently situated stations were required for hydrographic charting of these waters. In one area provincial triangulation was cut-in which serves the same purpose, since more precise positions were provided for these provincial stations. From the middle of July to the end of September two nets of secondary triangulation on the northern B.C. coast were completed to establish convenient stations in proximity to coastal waters. A small triangulation operation was undertaken in the Vancouver area, as a check on information secured several years previously.

LEVELLING

Field activities were confined to bench mark inspection work in northern Ontario. Commencing at Parry Sound a trip of inspection was made by railway motor car to Sudbury and North Bay by Canadian Pacific Railway, thence via Temiskaming and Northern Ontario Railway to Cochrane, including branches to Elk Lake, Noranda, Timmins, Iroquois Falls, and Fraserdale. The Canadian National Railways, National Transcontinental line from the Quebec border at Le Reine, Quebec, to the western end of the levelling on this line near Rennie, Manitoba, was next covered; also the bench marks between Winnipeg and Kenora, Winnipeg and Port Arthur via Fort Frances, and between Conmee and Sioux Lookout.

Some 860 bench marks were inspected during the course of the above operations, of which it was found that slightly over 5 per cent had been destroyed since their establishment or since their previous inspection. Revisions of the descriptions of a large number of the bench marks were required and new descriptions in certain instances.

During the year only one publication, "Altitudes in Eastern Ontario", was printed. This publication covers the portion of the Province of Ontario lying eastward of Georgian Bay and Toronto and southward of North Bay. Publication No. 44, "Altitudes in Southwestern Ontario", has been printed. Publication No. 46, "Altitudes in Northern Ontario" has been compiled and is being prepared for the printer.

GEODETIC ASTRONOMY AND ISOSTASY

During the year, the work of the Division of Geodetic Astronomy and Isostasy consisted in Laplace determinations at one of the geodetic triangulation stations of the Newfoundland triangulation net, the preparation of a base line in the vicinity of Bradore in the lower St. Lawrence geodetic net, and the determinations of the astronomical longitudes and latitudes at 13 geodetic stations in the Ontario and New Brunswick nets. The latter determinations are for the purpose of investigation into isostatic conditions in Canada.

Laplace Determination

The geodetic triangulation station "Irish" in the Newfoundland net in the vicinity of Parson's Pond was occupied as a Laplace point, (longitude and

azimuth). The astronomical latitude was also observed. The azimuth of the line "Irish" to "Steady" was measured. The Laplace observations at this station will control the direction of the triangulation of this net. A second station farther north in this net is required.

Base Lines

A base line in the Newfoundland net near Parson's Pond was located and partially prepared for measurement. This base is necessary to control the length of the Newfoundland triangulation. A base line on the north shore of the St. Lawrence near Bradore was prepared and measured. This line will furnish length control for the geodetic nets in Newfoundland and in the lower St. Lawrence. Two other base lines will be needed to complete the work between Anticosti Island and the Strait of Belle Isle.

Standardizing of Base Line Tapes

The lengths of the three fifty-metre invar tapes used in the measuring of this base line were determined from the length of the standard nickel bar No. 10239 both before and after the field season.

Deflection of the Plumb Line

The geodetic triangulation stations occupied for "Deflection of the Plumb Line" determinations, (longitude and latitude) were as follows: St. Croix, Bright, Hope, Wilmot, Forest City, I.B.M. No. 78, St. Leonards and Connors in the New Brunswick net, and Hallowell, Ameliasburg, Cold Springs, Clark, and Uxbridge in the Ontario net, thirteen in all.

Isostasy

Considerable progress has been made in the investigation into the shape and size of the earth from observations made in Eastern Canada. Deflection of the plumb-line determinations have been made at approximately 200 geodetic triangulation stations between the Atlantic Sea-board and the shores of Lake Huron. Both components, in the meridian and prime vertical, were determined, and the corrections for the effects of topography and isostatic compensation for a depth of 113.7 kilometres have been applied.

Starting with the geodetic station at Calais near the New Brunswick-Maine boundary and assuming the elevation of the geoid there as 10 metres, a rigid least-square reduction has been made for the height of the geoid for the above mentioned region between the Gulf of St. Lawrence and Lake Huron. This reduction shows that 25 or 30 observations in Ontario, and a similar number in Quebec are necessary to complete the investigation.

GEODETIC RESEARCH

The subject which received attention by this Division is that relating to long lines on the surface of the earth. In the treatment of long lines, it is evident that the inverse problem occurs with much greater frequency than does the direct problem. Investigations have been conducted along lines chiefly concerned with the former, and as a result it is believed that something has been added to the information which has been made available by others who have made a study of this problem.

TRIANGULATION ADJUSTMENTS

This Division has steadily advanced the transformation of the triangulation data in Eastern Canada from the North American datum to that of the 1927

North American datum. The necessity of this has been brought about through a revision of the United States triangulation upon the new basis, which in turn has assigned more accurate values to the basic points at or near the International Boundary to which the Canadian work is attached.

In Western Canada similar conditions existed and the transfer has now been completed in so far as the field work permits of final adjustments. An immediate advantage of far reaching effect has been that the United States Coast and Geodetic Survey has been able to place the coastal triangulation of southeast Alaska upon the same reference and similar treatment is now in progress for the Alaska Boundary survey. The ultimate objective is to have all geographic positions throughout the western half of the continent placed upon a uniform basis irrespective of the organizations performing surveys.

In Eastern Canada a greater depth of triangulation exists with several loop closures and extensive attachments which make the transfer more complicated; but the need is more urgent because of a greater use of the survey data in this area. With the extension of future work, it is hoped that preliminary adjustments can be made upon the new basis so as to avoid a repetition which must occur if the newer values are not currently available. Canada is under agreement with the Commission of Government of Newfoundland to adjust and publish the Newfoundland data. Efforts are being made to have the basic values available to incorporate this work upon the same basis as elsewhere on the continent.

Throughout the year in response to requests, control data for the revision of existing charts and maps have been forwarded to various organizations of the Dominion, Newfoundland, and United States Governments. In addition there has been a demand for similar data in localized areas for the purposes of defence and for aerial navigation.

LEVELLING ADJUSTMENTS

The field work performed during the years 1935, 1936, and 1937, which involved the breaking up of several circuits in northwestern Ontario, was incorporated into a new Adjustment of the Canadian Level Net. This work constituted four new circuits to be added to the Level Net of Canada, which already comprised a net made up of one hundred circuits. Work on this new adjustment is proceeding satisfactorily and the elimination part of the solution has been completed.

INTERNATIONAL BOUNDARY COMMISSION

The International Boundary Commission continued to perform the treaty obligation of maintaining the International Boundary between Canada and the United States, and between Canada and Alaska, in a state of effective demarcation. The boundary line between Canadian territory and territory of the United States is approximately 5,500 miles long, and comprises one of the longest international boundary lines in the world. Much of it is through forested area and thus requires the re-clearing of the boundary vistas at various intervals. Other sections of the boundary are located in international waters or settled country where frequent inspection of boundary monuments is required so that these will be properly maintained and accurately placed.

The Boundary Commissioners of Canada and the United States carried out their duties in connection with boundary maintenance. A conference was held in Ottawa from January 25 to 27, 1940, at which a number of important boundary matters were discussed, including details of the field work for the 1940 season. Further discussions were held by the Boundary Commissioners in Toronto on August 30, 1940.

Inspection

On August 21 and 22 the Canadian and United States Commissioners inspected the work of the party engaged in inspecting and repairing boundary reference monuments and searching for original boundary triangulation stations on the St. Lawrence River; this work extended from Oak Point, about 6 miles above Brockville, to Lake Ontario. They then proceeded to the Niagara River to investigate the facts relating to a reference monument at Fort Erie for which a request for removal from its original site had been made.

Maintenance of the Boundary

A survey party of the Canadian section of the Commission carried on maintenance operations on the "North Line" section of the boundary, between New Brunswick and Maine, and on the St. John River. On the "North Line", about 77 miles long, the vista was recleared, 32 monuments were repaired, 1 monument was rebuilt, 1 new monument was established, and 2 plane-table sketches were made. In the section where the vista had been cut in 1933 the new growth, while small in size, was very thick and to obtain a 22-foot sky-line much cutting of large trees at the sides of the line was required; all the branches were cut off the felled trees and spread on the ground in such a manner that a foot path was left for the patrol men. Also in this section 10 out of 17 of the original stations of the boundary triangulation searched for were recovered and permanently marked. On the St. John River 22 new monuments were erected to reference the boundary more adequately, 67 triangulation stations were occupied, and 15 plane-table sketches were made.

On the St. Lawrence River an engineer of the Canadian section of the Commission again acted as Canadian representative on a survey party of the United States section engaged in inspecting and repairing reference monuments and in recovering, remarking, and preparing descriptions of boundary triangulation stations. Work was begun where it was discontinued last year, and, as stated above, extended from Oak Point to Lake Ontario, a distance of about 49 miles. During the season 161 triangulation stations were occupied, described, and permanently marked. Of these 57 were original stations, 55 were substitute stations to replace original stations which could not be found, 7 were new stations established to strengthen the triangulation, 12 were United States Lake Survey stations, and 30 were boundary reference monuments. Most of the recovered stations and the new stations were marked with standard International Boundary Commission bronze triangulation discs.

HYDROGRAPHIC AND MAP SERVICE

The Hydrographic Service of Canada conducts the charting of Canadian coastal and inland navigable waters, the investigation of tides and tidal currents, and the precise water-level recording of the St. Lawrence-Great Lakes waterway. The Service constitutes the Federal authority for general navigational information, hydrographic surveys being required for the protection of life and property at sea.

The Legal and Map Service conducts legal surveys required by this and other Departments. It compiles and prepares aeronautical charts, electoral maps, general maps for the use of the various Government departments, natural resources and railway maps, and general maps of Canada, and maintains a lithographic office for the reproduction of hydrographic charts and other maps prepared by the Department within the capacity of the presses installed. It maintains a central office for indexing files and recording survey returns and plans, and distributes topographical and general maps of Canada.

HYDROGRAPHIC SERVICE

Few Government civilian services have been required to apply their efforts more extensively to supplying information for war purposes than the Hydrographic Service. During the year it provided to the Naval, Merchant Marine, and Air Forces, basic navigational information pertaining to Canadian coastal and inland waters. Special harbour surveys were undertaken from time to time as required for shipping interests. Expanding defence measures on sea and in the air resulted in a great increase in emergency charting, and also increased the demands for the standard navigational publications including Nautical Charts, volumes of Pilots and Sailing Directions and official Tide Tables. Special naval charts, including radio direction-finding diagrams to facilitate the rapid location of ships at sea, were also prepared by this Service. Several sheets were added to the new series of Customs Act Maps: semi-nautical publications which show the boundary between Canadian waters and the High Seas. War demands, given priority in all cases, greatly augmented activities of all Divisions.

The administration of the various Divisions comprising the Hydrographic Service is conducted from Hydrographic Headquarters, Ottawa, which also serves as a clearing centre for general navigational information. The District Hydrographic Office at Victoria facilitates the conducting of general charting and tidal operations on the Pacific Coast and serves as a distributing centre for hydrographic publications pertaining to the Pacific Sea-board. This geographic organization of the Hydrographic Service permits closest contact with the chart requirements of the Naval Service on both coasts and at Naval Headquarters, Ottawa.

During the year, the hydrographic vessels *Cartier* and *Acadia*, formerly used by this Service in the Atlantic Coast district, were still on loan to the Navy. In consequence, hydrographic work on the East Coast had to be carried on with the use of motor craft. This restricted the areas in which charting could be done, but in order to be in a position to undertake emergency work on shortest notice, the hydrographic units were located strategically along the coasts. This geographic dispersion enabled the carrying on of the regular charting program during periods when hydrographic operations for specific war purposes permitted. A great deal of special charting and technical investigations were undertaken for the Defence Forces in a number of harbours on both the Atlantic and Pacific Sea-boards. At the request of the Naval Service, special hydrographic work was undertaken in a strategic harbour in Newfoundland.

For navigational purposes, tidal current investigations were made in the Gulf and River St. Lawrence and new tidal information was prepared for certain areas on the Atlantic and Pacific Sea-boards. The Precise Water Levels Division continued the recording of water surface elevations on the St. Lawrence-Great Lakes Waterway. Water-level records maintained by this Division are of vital importance to navigational and power interests and to the St. Lawrence Seaway Project.

Exchange of Hydrographic Data.—As in past years, several other Government Departments participated in the exchange of information pertaining to the navigation of Canadian waters. In particular, a great deal of very important material affecting nautical charts and volumes of Pilots and Sailing Directions was received from the Naval Service. The Departments of Transport and Public Works also supplied considerable data relating to aids to navigation and in connection with channel and harbour improvements. Reciprocating, the Hydrographic Service furnished these Departments with standard nautical publications such as Charts, Sailing Directions, Tide Tables, and Water Level Bulletins. The Hydrographic Service also reported on the finding of uncharted rocks or

other dangers to navigation and informed maritime interests regarding chart corrections and the issuance of new charts, through the medium of the official Notices to Mariners, published by the Department of Transport.

Many new charts and publications were received from the British Admiralty Hydrographic Department, the United States Hydrographic Office, the United States Lake Survey Office at Detroit, and the International Hydrographic Bureau at Monaco. A large proportion of Canadian coastal waters are covered only by original Admiralty charts, and in order to keep these corrected to date, information was supplied from time to time to the Admiralty. The established contact with the Admiralty and with the United States Hydrographic Office has been found to be of great value during the War.

Pilots and Sailing Directions.—The volumes of Pilots and Sailing Directions published by this Service cover a great part of the coastal and inland navigable waters of the Dominion. These books describe the shores, channels, shoals, banks, and reefs, and deal fully with the nature and location of the various aids to navigation installed on the routes. Recommended ships' courses are a most important part of the Sailing Directions and are given after full consideration of all navigational factors involved. Many other necessary nautical data are also set forth, including Pilotage Regulations, Fees, Special Rules of the Road, Descriptions of Harbours, Harbour Facilities, Harbour and Sick Mariners' Dues, Depths at Wharves, Anchorage Regulations, and such general information pertaining to marine transport as is required by the continual natural and artificial changes which affect navigation. In addition to performing this work, the Sailing Directions Section undertakes considerable research work and provides a ready reference service for general navigational information.

HYDROGRAPHY

ATLANTIC COAST AND INLAND WATERS

Most of the smaller harbours and ports of the Maritime Provinces on the Gulf of St. Lawrence shore were charted about 100 years ago and for a number of years Naval and Marine officials, and local shipping and industrial interests have intimated the need for modern large scale charts. Since the outbreak of war many of these minor ports assumed a new significance.

Atlantic Coast and Bay of Fundy.—Equipped with motor craft this hydrographic unit conducted charting operations at various places on the Atlantic Coast of Nova Scotia. From May 2 to July 5, Port Hebert, Nova Scotia, and its approaches were charted and large scale plans were made of critical portions of the channel. To further enable ships to take advantage of available depths, recommendations were submitted for an improved system of aids to navigation to lead into the harbour. From May 1 to 25, and from July 5 to 18, a detached party of hydrographers continued the modern charting of Mahone Bay from the point where the work terminated the previous season. During the course of the charting, a number of shoals outside the harbour were examined. At the request of the Department of National Defence, a detailed hydrographic survey was made of the entrance to Shelburne Harbour, Nova Scotia, and on completion of this work the whole harbour and its approaches were thoroughly charted. This project occupied from July 18 to October 30.

An important part of the year's operations by this unit was the emergency charting in Halifax Harbour for specific war purposes.

As a result of the season's work a number of special hydrographic plans and navigation reports were supplied to the Department of National Defence, existing coast charts will be brought up to date, and a new standard chart "Shelburne Harbour and Approaches" will be published.

Summary of Season's Work

Boat sounding	672 linear miles
Coastlining	122 " "
Shoals examined	155

Gulf of St. Lawrence-Cape Breton.—Charting operations were conducted in Northumberland Strait, Cape Breton Island, and in certain harbours on the Gaspé Coast. The echo sounder equipped motor cruiser *Henry Hudson,* used the previous season for recharting Quebec Harbour, again outfitted at that port and proceeded to Charlottetown where she arrived on May 28. Charting of the proposed new Northumberland Strait ferry terminals at Caribou Harbour, Nova Scotia, and Wood Island, Prince Edward Island, was begun the following day.

During the season the former harbour and its approaches were closely sounded and the coastline surveyed. Caribou Channel, an important approach to the ferry terminal and to Pictou Harbour was also charted. In this locality sea currents are constantly shifting the sand and piling it up in bars.

On the north side of Northumberland Strait, Wood Island was charted and the work extended west along the Prince Edward Island Coast to connect with the recent hydrographic survey of Hillsborough Bay. Upon the completion of this charting on August 23, hydrographic operations were undertaken in Amet Sound and continued there until October 26 when weather conditions prevented further operations in that locality. The boats were returned to Charlottetown and there laid up for the winter.

While the above hydrographic work was in progress, a small detached party permanently marked a number of triangulation stations on the east coast of Cape Breton Island. Charting for the Naval Service was undertaken in two harbours on the Gaspé Coast. At the request of the Defence Forces, two hydrographers proceeded to Newfoundland where they conducted detailed hydrographic work in an important harbour.

As a result of the season's work there will be published a modern chart—"Caribou Harbour and Approaches" with large scale insets of both the ferry terminals. Considerable hydrographic information was obtained for inclusion in a proposed new general chart of Northumberland Strait.

Summary of Season's Work

Boat sounding	1,329 linear miles
Coastlining	118 " "
Shoals examined	24

St. Lawrence River.—The hydrographic launch *Boulton* sailed from her winter base at Prescott, Ontario, on May 15 and proceeded to Trois Rivieres, Quebec, where charting operations were undertaken as part of the general project of recharting the St. Lawrence River from Quebec to Montreal. During the season, the river was charted from Pointe Citrouille to the foot of Lake St. Peter on a scale of 1,000 feet to 1 inch. Included in the work was the detailed survey of Trois Rivieres Harbour where a great many changes have taken place since the original charting in 1901-02. Upon completion of the work on October 18 the *Boulton* returned to her base.

As a result of the season's operations there will be published a new chart—"Champlain to Foot of Lake St. Peter". This will contain a large scale inset of the harbour of Trois Rivieres. The chart will be the third of the new Quebec-to-Montreal series.

Summary of Season's Work

Boat sounding	802 linear miles
Coastlining	75 " "
Shoals examined	66

PACIFIC COAST

Main charting operations in this district are conducted by means of the hydrographic vessel *Wm. J. Stewart* and the Houseboat *Pender* but, since the outbreak of war, a great deal of special charting and important emergency work for the Naval Service and the Royal Canadian Air Force was carried on directly from the Victoria Office.

The hydrographic steamer *Wm. J. Stewart* was commissioned at Victoria, and on April 25 cleared that port with the Houseboat *Pender* in tow. The following day the latter craft was let go in the vicinity of Pender Harbour, Malaspina Strait, and the ship proceeded to conduct ship sounding operations off Gabriola Island on the western side of the Strait of Georgia. The period from May 1 to June 8 was occupied in charting the northern portion of the Strait from Cape Mudge to Desolation Sound. Following this, ship sounding was undertaken in Malaspina Strait and on June 12 ship triangulation was done off Porlier Pass. The *Pender* was then towed to Hunter Channel, off Queen Charlotte Sound, reaching that destination on June 15.

From June 17 to September 14 the ship carried on coastlining, sounding, and shoal examining, in the area Milbanke Sound and Hakai Passage. On July 13 a geodetic survey party, engaged in coastal triangulation, was taken aboard at Hardy Bay. Triangulation stations were erected on the rocks in the Sea Otter Group, Queen Charlotte Sound, and a camp was established at Safety Cove, Calvert Island. On September 21 the launch and crew loaned to this party were taken aboard at Port Harvey, Johnstone Strait.

On September 14, the *Pender* was returned to Malaspina Strait and resumed sounding operations there on September 16. The ship proceeded to Sutil Channel, east of Cape Mudge, where coastlining and boat sounding were carried on. On September 27, she rejoined the *Pender* at Buccaneer Bay and conducted sounding in that vicinity. On September 30, the ship with houseboat in tow, sailed for Victoria and arrived there the same evening. This closed the regular charting program for the season but, in order to undertake special technical investigational work for the Navy, the ship proceeded to Vancouver Harbour on October 2 and was engaged until the 10th, when she returned to Victoria for final decommissioning.

Summary of Season's Work

Coastlining	251	linear miles
Boat sounding	1,206	" "
Ship sounding	326	" "
Shoals examined	465	

Hydrographic Houseboat Pender.—This auxiliary craft, moved as indicated in the foregoing report, carried on extensive hydrographic operations in two general localities. In the early and latter part of the season areas were charted in Malaspina Strait, southern portion of Jervis Inlet and in Agamemnon Channel.

From June 15 to September 14, charting operations were conducted farther north, in Cultus Inlet, Keldidt Inlet and Nalau Passage. In both localities the work was a continuation of the previous season's projects. The *Pender* was returned to Victoria on September 30 and there laid up for the season.

Summary of Season's Work

Coastlining	449	linear miles
Boat sounding	1,052	" "
Shoals examined	303	

Precise Water Levels

The Precise Water Levels Division is responsible for securing and compiling accurate water level records of the Great Lakes-St. Lawrence navigation system. To accomplish this purpose there is maintained a system of interrelated automatic recording gauges established at critical points from Port Arthur nearly to Quebec. By means of local assistance and periodic inspections from Headquarters, the stations are maintained in precise adjustment and continuously record the rise and fall of lake and river. An important phase of the work is the determination of accurate low water datum planes to which the depths on navigation charts are referred.

Existing water levels affect both loading capacity of ships and power developments, factors of great importance in Canada's war effort. The water level records, published in the form of bulletins and graphs, are issued to navigational, engineering, and other interests. Owing to its wide application, the information in these reports is republished in Engineering and Marine Journals.

During the year, from the 521 months continuous recordings in the field, over 600,000 water surface elevations were computed, collated, and compiled into comprehensive tabulations. A total of some 25,000 sheets of bulletins, profiles, etc., were issued during the year. Twelve monthly, five annual, six general data, and five graphic bulletins were also issued.

TIDES AND CURRENTS

Main functions of the Tidal and Current Division are the obtaining and study of tidal data for prediction of times and heights of flood and ebb tides and for the determination of the strengths and directions of tidal currents. Tidal predictions, produced by this Service and disseminated to the public in the universal form of Tide Tables, are accurate and reliable. Without them, navigation of any kind would be extremely handicapped.

Because of the importance of tidal action to navigation, all new editions of sea charts are first submitted to the Tidal and Current Division for incorporation of latest available data regarding tides and tidal currents. The latter nautical information, by enabling ships to take advantage of assisting tidal currents, instead of being delayed by opposing streams, shortens the length of time required for a voyage and effects savings in ship operation costs—factors of great importance, especially in wartime. Naval vessels may be called upon to navigate any part of Canada's coastal waters and fullest information in regard to tides and tidal action is vital.

Heretofore, tidal work on the Pacific Coast was conducted through a separate tidal office at Vancouver, but it has now been amalgamated with the Hydrographic District office in Victoria. The new arrangement has not only contributed greatly to the efficiency and quality of the work, but has effected considerable economy.

During the early part of the fiscal year the preparation of the various editions of the Tide Tables for 1941 was completed and the manuscript forwarded to the printer. Work, also, on the 1942 editions was advanced. Two complete editions, one for the Atlantic Coast and one for the Pacific Coast are published for shipping interests generally. Besides these, are six abridged pocket editions to serve the needs of fishermen and others locally—four cover various localities on the east coast and two on the west coast. The publications are classified as follows:—

Atlantic Coast Tide Tables.—"Tide Tables for the Atlantic Coast of Canada", complete edition. There are abridged editions entitled "Quebec and Father Point", "Charlottetown and Strait of Canso", "Halifax and Sydney", "Saint John and Bay of Fundy".

Pacific Coast Tide Tables.—"Tide Tables for the Pacific Coast of Canada", complete edition. There are abridged editions entitled "Vancouver and Sand Heads" and "Prince Rupert and Northern British Columbia".

The Tide Tables are sold by the Department of Public Printing and Stationery but, as a service to the public, postmasters in seacoast towns, maritime newspapers, libraries, and tourist bureaus are supplied with free copies each year. Government Departments are supplied for their official needs free of charge.

The principal tidal stations maintained in operation are:—

Atlantic Coast.—Quebec, Father Point, and Harrington, P.Q.; Charlottetown, P.E.I.; Saint John, N.B.; Halifax, N.S.; Churchill, Man.

Pacific Coast.—Vancouver, Victoria, Clayoquot, and Prince Rupert, B.C.

With the exception of the installation of a tide recorder at Port Alberni, B.C., no seasonal tidal stations were established, but gauges were loaned to hydrographic parties for use in connection with charting operations. Records obtained were analysed and reductions were made for Tide Table purposes.

Investigation of Tidal Currents.—Reconnaissance inspections were made of tidal currents in certain passages between islands and the mainland on the north coast of the Gulf of St. Lawrence. A reduction was also made of current observations taken in the St. Lawrence River below Lake St. Peter. The information will be shown on the new navigation chart covering that section of the river.

Information Service.—Tidal data were furnished to navigation interests, engineers, scientific societies, colleges, and the legal service. Considerable special data were prepared on request of the Defence Forces and much other tidal information was supplied to the public and Government Departments.

CHART CONSTRUCTION

This division is responsible for the compilation, drafting, engraving, and correction of new editions of standard navigation charts, and charts for special purposes. To meet the greatly increased demand, many more and larger editions of charts were published. Special folios of charts were supplied to the Navy in great quantity and a number of reproductions were made of certain Admiralty charts required on short notice. The year's output consisted of the following: 49 charts published in colours; 43 charts published in black only including 18 reprints of 14 British Admiralty charts; 5 charts published as process prints; 4 Customs Act Maps; 1 special direction-finding diagram; 3 wall charts for Naval Intelligence Service; 3 patches for chart correction.

List of Nautical Charts Issued 1940-41

Province	No.	Title	Scale Inches to Nautical Mile	Remarks
Que	1	Montreal Harbour	6·0	New
"	2	Longue-Pointe to Varennes	6·0	Reprint
"	21	Quebec Harbour	6·0	New
Ont	57	Galop Island to Rockport	2·2	Reprint
"	58	Rockport to Howe Island	2·2	"
"	65	Toronto Harbour	6·0	New
"	68	Lake Ontario (General Chart)	0·2	Reprint
"	69	Bay of Quinte	1·2	"
"	79	Lake Huron	0·2	"
"	83	Waubaushene to Western Islands	1·5	"
"	84	Parry Sound and Approaches	1·5	"

List of Nautical Charts Issued 1940-41—Continued

Province	No.	Title	Scale, Inches to Nautical Mile	Remarks
Ont.	85	McCoy Islands to Collins Inlet	0·8	Reprint
		Pointe au Baril Harbour	5·2	
		Alexander Inlet	7·1	
		French River	3·0	
"	94	Little Current	6·0	"
"	96	Cape Hurd to Gull Island	0·8	"
		Tobermory Harbour	6·0	
		Club Harbour	6·0	
		Rattlesnake Harbour	4·1	
"	99	Key Harbour and its Approaches	6·0	"
"	100	Georgian Bay (General Chart)	0·4	"
"	101	Head of Thunder Bay to Pigeon River	1·0	"
"	111	Plans of Harbours, Georgian Bay	.....	"
		Midland Harbour	12·0	
		Tiffin	12·0	
		Port McNicol and Victoria Harbours	6·0	
"	114	Fort William and Port Arthur	4·0	"
"	117	Port Severn to Present Island	4·0	New
"	142	Lake of the Woods (General Chart)	0·52	Reprint
"	149	Humboldt Bay	2·0	New
"	150	Plans in Lake Nipigon	.....	"
		Virgin Islands	4·0	
		Ombabika Bay	2·0	
Que.	204	Bic Island to White Island	0·9	Reprint
		Escoumains	1·9	
"	209	Saguenay River, St. Fulgence to Shipshaw	4·0	"
"	211	Father Point to Pointe aux Orignaux	0·4	"
"	213	Cape Magdalen to Pointe des Monts	0·5	"
		Mont Louis Bay	3·0	
		Ste. Anne des Monts Bay	3·0	
		Pentecote River	6·0	
"	215	Pointe des Monts to Father Point	0·5	"
B.C.	302	Genn Island to Tugwell Island, Chatham Sound	2·0	New
"	307	Juan de Fuca Strait	0·5	Reprint
"	315	Victoria Harbour	12·0	"
"	316A	Esquimalt Harbour (Special edition)	.....	New
"	318	Vancouver Harbour, Sheet 1 (First Narrows to Second Narrows)	8·0	
"	320	Idol Point to Ocean Falls	1·8	Reprint
		Gunboat Passage	6·0	
		Ocean Falls	6·0	
B.C.	322	Race Rocks to Discovery Island	2·5	Reprint
"	330	Fraser River, Sheet 2, Steveston to Deas Island	5·7	"
"	336	Laredo Inlet and Approaches	1·0	New
"	349	Race Rocks to Turn Point	1·0	Reprint
"	350	Turn Point to Sand Heads	1·0	"
"	351	Discovery Island to Beaver Point (Saltspring Island) including Saanich Inlet	2·0	"
"	353	Cape St. James to Tasu Sound	0·5	"
"	362	Esperanza Inlet, Maquinna Point to Kyuquot Channel	1·0	"
"	368	Port Louis to Langara Island	1·0	New
"	379	Rivers Inlet (entrance)	2·0	"
"	382	Kyuquot Sound	2·0	"
"	387	Channels in vicinity of Yorke Island	2·9	Reprint
N.S.	411	Egg Island to Pennant Point	0·7	"
"	415	Sydney Harbour	3·5	"
"	416	Halifax Harbour	6·0	"
		Halifax Dockyard	18·0	
N.B.	444	St. John River, Saint John to Evandale and Kennebecasis Bay to Perry Point	2·0	"
N.S.	475	Guyon Island to Flint Island	1·0	New
N.B.	478	Shediac Harbour	6·0	"
N.S.	479	Liverpool Harbour	8·7	"
	C	Marine Direction Finding Chart	.....	Reprint
	C	" " ..... (R.C.A.F.) (two editions).	.....	"
	D	Currents in Montreal Harbour	.....	"
	D1	Currents in Montreal Harbour	.....	"
Que.	P 1003	Matane Harbour (2 editions)	12·0	"
N.S.	P 1007	St. Patrick Channel, MacIver Point to Little Narrows	10·0	New

List of Nautical Charts Issued 1940-41—Concluded

Province	No.	Title	Scale, Inches to Nautical Mile	Remarks
Que.	P 1028	Fox River Bay (2 printings)	6·0	New
"	P 1221	Laval Bay	12·0	Reprint
"	P 1440	Anchorages in Magdalen Islands		"
		Grand Entry Harbour	6·0	
		Cape Alright to Grindstone Wharf	3·0	
		Grindstone Wharf	12·0	
		Amherst Harbour	6·0	
"	P 1508	Erik Cove to Nuvuk Harbour including		"
		Digges Islands	1·03	
		Erik Cove	2·7	
		Digges Harbour	5·5	
		Port de Laperriere	5·5	
		Nuvuk Harbour	1·8	
Ont.	P 2052	Oshawa Harbour	30·4	"
"	P 2053	Bay of Quinte Harbours		"
		Telegraph Narrows	6·0	
		Belleville Harbour	24·0	
		Nigger Narrows	6·0	
		Trenton and Approaches	6·0	
"	P 2070	Plans of Harbours		"
		Cobourg Harbour	11·1	
		Port Hope	11·0	
		Port Whitby	13·9	
		Port Credit	13·8	
		Oakville Harbour	13·9	
		Port Dalhousie	7·0	
N.W.T.	P 2170	Slave River to Mackenzie River	0·33	"
		Entrance to Mackenzie River	1·5	
B.C.	P 3234	Burdwood Bay (Head Island) (2 printings)	12·0	"
"	P 3329	Fraser River, Sheet 1	6·0	"
		Entrance to Steveston.		
"	P 3355	Houston Stewart Channel	4·0	"
"	P 3357	Louscoone Inlet	4·0	"
"	P 3359	Tasu Sound	3·0	"
"	P 3363	Port Chanal	4·0	"
"	P 3364	Gowgaia Bay	4·0	"
		Index maps for catalogue (3).		
	599	Wall map, Atlantic Coast, for Dept. of National Defence		New
		Wall map, Pacific Coast, for Dept. of National Defence		"
		Wall map, Atlantic and Pacific, for Dept. of National Defence		"
N.S.		Direction-finding diagram.		
		14 British Admiralty Charts.		
		CUSTOMS ACT MAPS		
	5	Northumberland Strait.		
	6	Cape Breton Island.		
	9	Halifax to Cape Sable.		
	10	Approaches to Bay of Fundy.		

DISTRIBUTION OF NAUTICAL PUBLICATIONS

Owing largely to exigencies of war, the number of calls for navigation charts in the calendar year 1940 greatly exceeded those of any other year in the history of this Service. The following figures show the increasing demand for these aids since the year 1933: 1933, 8,470; 1934, 9,236; 1935, 10,228; 1936, 12,883; 1937, 14,006; 1938, 17,999; 1939, 19,850; 1940, 31,154.

Nautical publications distributed during the year were as follows:—

Catalogue of Charts, Sailing Directions, and Tidal Information with Index Maps	774
Navigational Charts	31,154
Pilots and Sailing Directions	1,006
Tide Tables	38,727
Water-levels Bulletins. graphs	25,000

There are now available for issue to the public 503 official charts of the Hydrographic Service of Canada. These charts of Canadian waters comprise general charts, coast sheets, river and lake charts, harbour and roadstead plans, and charts for special purposes. They are made up as follows:—

Atlantic Coast (including St. Lawrence River to the head of ocean navigation at Montreal; Saguenay and Richelieu Rivers; and Hudson Bay and Strait)	207
Great Lakes and inland waters	139
Pacific Coast (including Vancouver Island)	136
Charts for special purposes	21

There were 90,554 copies of charts in stock at the Hydrographic Office on January 1, 1941. For the convenience of shipping, a distribution service through local chart dealers, merchants, or Government officers has been provided, whereby charts and other hydrographic publications may be procured at the official list prices, in the following ports: Halifax, Yarmouth, and Canso, N.S.; Saint John, N.B.; Charlottetown, P.E.I.; Quebec, St. Jean, and Montreal, P.Q.; Ottawa, Kingston, Toronto, St. Catherines, Port Colborne, Midland, Parry Sound, Killarney, Sault Ste. Marie, Little Current, Port Arthur, Humberstone, and Kenora, Ont.; Winnipeg and Churchill, Man.; Seattle, Wash.; Prince Rupert, Vancouver, and Victoria, B.C.; New York, N.Y.

MAP SERVICE

The functions of the Map Service embrace a wide field of activity in surveys and map making across the Dominion. During the year, the work of this Service has been greatly influenced by the general mobilization necessary for the war effort and the fuller realization that maps have now become implements of war. As a result the main effort has been towards speeding up the production of maps required for war purposes, and particularly for air navigation.

During the calendar year of 1939 there were 8 new maps, of which 42,805 copies were printed; during 1940 there were 24 new maps and 5 reprints, of which 208,468 copies were printed; in the first four months of 1941 there have been 4 new maps and 26 reprints, of which 278,290 copies have been printed.

Details of map compilation and printing are given further on in this report under the headings of: Map Compilation, Map Distribution, and Map Publication. Production figures given include general purpose maps, special maps, and the various classes of maps required for war purposes.

Legal Surveys

This Division acts as a central surveys organization for the carrying out of legal surveys required by various Departments of the Government. Many of the records made under the Dominion Lands System and the survey records in connection with the Indian Reserves, National Parks, mineral claims, settlement lots on Dominion lands, and in connection with ordnance lands, aviation fields, and penitentiaries are on record in this office.

Under the provisions of the Quartz Mining Regulations and the Yukon Quartz Mining Act, all surveys of mineral claims on Dominion lands must be made by Dominion land surveyors in accordance with the Manual of Survey, and the notes and plans submitted to the Surveyor General for examination prior to his approval. These surveys are made under the special instructions of the Surveyor General.

During the year this organization, in co-operation with a surveyor commissioned by the Province of Alberta, selected lands in ten localities in the vicinity of Hay Lakes, Hay River, and Lubicon Lake for the Indians of those localities. It is hoped that surveys of the lands selected may be made in the near future. These Indians were promised lands in accordance with the

provisions of Treaty No. 8 but up to the present time these have not been definitely set aside for them. In British Columbia four surveyors were engaged on resurvey of the boundaries of Indian Reserves to settle disputes over alleged trespass, and several parcels of land were surveyed with a view to purchasing them for the use of the Indian Affairs Branch. In Alberta, in addition to the lands selected for reserves, a church site was surveyed at Hobbema. In Saskatchewan an extension to Loon Lake townsite was surveyed. In Manitoba a former lake shore which had been a boundary between The Pas Indian Reserve and Provincial lands was more particularly defined by a surveyed and monumented line accepted by all parties concerned. Surveys to determine and settle cases of alleged trespass and other local problems regarding the proper location of boundaries and roads were made. Recommendations for settlement of the disputes were submitted with respect to Brokenhead and Riding Mountain Indian Reserves. The north and east boundaries of that portion of Nipissing Indian Reserve north of the railway were surveyed and monumented. Hamilton, St. Regis, and Yellow Islands at St. Regis were subdivided and detailed plans showing all fences and buildings were prepared. A parcel of land near Kingston was surveyed for the Indian Affairs Branch. In Quebec portions of Ouiatchouan Indian Reserves at Pointe Bleue were resurveyed and a survey made of the water works system at Lorette. In New Brunswick a detailed survey was made of the whole of St. Basil Indian Reserve to show the parcels leased and to be leased and all Indian houses and fences and the roads, power-lines, and the school lot. A survey of the surrendered portion of the Big Hole Indian Reserve was made for the purpose of preparing titles for transfer. A survey plan and legal description of parcels of land to be exchanged at St. Vincent de Paul penitentiary were prepared for the Department of Justice. Survey plans, legal descriptions, and reports were prepared for lands at Pointe aux Trembles, Fort Beausejour, and lands in the Township of Hull for the Lands, Parks and Forests Branch. Valuation surveys and valuations were submitted for 60 parcels of land at Caughnawaga to be taken over by the Quebec Provincial Government for roads. Valuations were secured for many parcels of land in parts of the Dominion which were taken for roads, power purposes, and other public uses. Compiled plans of Indian Reserves showing surrounding surveys, roads, power-lines, parcels alienated or leased, and other information from available aerial photographs and plans are being made. The Division now has 27 of these plans out of a total of 2,125 required.

The Division is co-operating in as far as possible with all provincial governments in the exchange of survey information. Many inquiries continue to be received from Manitoba, Saskatchewan, and Alberta regarding field notes and plans of lands surveyed under the Dominion Lands System of Survey.

Computing and Electoral Maps

Magnetic Work.—The work of collecting, recording, and studying magnetic declination observations continued during the year. Because of restricted field work of Federal and Provincial survey organizations, less than the usual number of observation records were received, but the total number of observation results in the records now exceeds 36,000.

This Service for many years issued, at five-year intervals, a map of Canada showing the isogonic lines or lines of equal magnetic declination; the last edition was published in 1932. Because of shortage of staff, the Division was unable to publish the 1937 edition. The 1932 edition became exhausted in 1939 and the question arose whether the practice should be adhered to of five-year periodic editions which had been continuous from 1907 to 1932, issuing the new map as of 1942, or whether the new map should be issued as soon as possible showing magnetic data as of 1940. The maps already issued had been made to show information as of the same dates as the magnetic maps issued by the British

Admiralty, whereas the magnetic maps of the United States, also issued at five-year intervals, show magnetic data as of the years 1925, 1930, 1935, and so on. In view of the urgent demand for a new map and the large amount of air navigation extending adjacent to and across the United States border, it was decided to issue the map as of 1940 and henceforth adhere to the same five-year periods as the United States.

In order to utilize the vast mass of data in the records it was necessary to obtain the best possible information on the annual change in declination over the whole country. The determination of this annual change is a function of the Dominion Observatory and upon request the Observatory made an analysis of field observations and supplied the necessary information. The isogonic lines have been compiled and supplied to the Hydrographic Service for presentation on a new Traffic Chart of the Maritime Provinces, Gulf and Lower St. Lawrence now in preparation, and considerable work has been done in preparation of the new magnetic map of Canada.

Much magnetic information was also prepared for incorporation on the marine charts of the Hydrographic Service, the air charts issued by this Service and, when requested, for maps issued by other map-producing organizations. A large number of requests for magnetic information were also received from provincial survey organizations, surveyors, and the general public.

Electoral District Maps.—The usual work was done in keeping base maps up to date as regards changes in parish, municipality, and county boundaries, so as to be in a position to deal with work necessary to the next redistribution.

Requests for electoral maps were received from many Government offices for administration purposes and from the general public. The national registration carried out during the year was based upon electoral districts and created a large demand for maps. Some work of this nature was also done by the Mines and Geology Branch of this Department and all the Division's basic maps were placed at their disposal, as required.

Computations.—There was the usual large amount of mathematical and computational work essential in a large mapping office. The work included the study and computation of different types of map projections to suit special purposes, the reduction of astronomical observations, the computation of Astronomical Field Tables and the computations of distances on the earth's surface.

Astronomical observations obtained by Mr. T. H. Manning of the British, Canadian Arctic Expedition were taken to determine latitude, longitude, and magnetic declination and formed the basis of his exploratory traverses in Baffin and Southampton Islands during the years 1936 to 1940. It was agreed that this Service should reduce and analyse the observations and that Mr. Manning would make available to this Service the results of his geographical traverses and explorations based upon them.

The Astronomical Field Tables were computed as usual. The use of the 1927 tables was discontinued after 1939, and new master tables computed during the year. These tables were used as a basis for the field tables computed and issued during the year.

The computation of distances is done at the request of the Post Office Department and occasionally of the Department of Transport. The distances supplied to the Post Office Department are used as a basis for air mail contracts. Several requests have been received from other sources for distances from points on this continent to points in Europe and Asia.

Miscellaneous.—Considerable control survey information was prepared and supplied to other Federal and Provincial offices and to private firms and individuals. This necessitated consulting and interpreting the records of the original surveys and the preparation of much information based on them.

Map Compilation

The chief functions of this Division are the compilation of maps and the checking of map manuscripts, drawings, and proof copies. During the year the main work was on the air navigation editions of the eight-mile to one-inch sheets of the National Topographic Series.

Owing to the urgent demands for air navigation charts little progress was made during the year on the preparation of the standard topographical editions of this series.

Thirty-eight sheets of this series have now been printed across the continent from Vancouver to Newfoundland. Excluding overlaps but including the parts mapped in the United States and Newfoundland, they cover an area of about 870,000 square miles or slightly less than one quarter of the total land and fresh-water area of Canada.

Fifteen other sheets, ten of which are compiled, are in the course of preparation and the program is being extended as quickly as the staff will permit, in order to meet the training and defence requirements of the Royal Canadian Air Force.

The material used in the topographic bases is the latest available from all sources. In its collection, Federal and Provincial Government departments and private corporations have co-operated. A co-operative arrangement was made with the Government of Newfoundland by which their chief surveyor supplied information from which air navigation charts of that country were prepared. This co-operation is continuing for the mapping of the Labrador Coast.

The preparation of the red overprints, showing air information, requires close co-operation with the Department of Transport and the Royal Canadian Air Force in order that the rapidly increasing aids to air navigation may be kept up to date. Originally it was estimated that the aeronautical data on the charts would require revision about every two years. However, during the present abnormal period, it has been found necessary to revise them three times during the year. The acceleration in the expenditure of charts due to the rapidity in the expansion of the British Commonwealth Air Training Plan is the chief factor causing the frequent revisions.

So far all of the new air navigation charts in Canada are at the eight-mile to one-inch scale. There is a demand for charts at the sixteen-mile to one-inch scale. Limitations in staff and demand for the eight-mile sheets have made it impossible to commence the sixteen-mile series. A series of plotting sheets on Mercator's projection at a mean scale of 1:1,000,000 has, however, been prepared by the Geographical Section of the Department of National Defence.

The United States Coast and Geodetic Survey, which publishes the aeronautical charts of the United States, continued to furnish us with up-to-date data of aeronautical aids for the portions of the Division's air charts which lie in that country. On the other hand, because of the restrictions placed on the Dominion's air chart distribution which does not apply to that of the United States, the U.S. Coast and Geodetic Survey kindly refrains from showing the changes in air navigation aids on the Canadian portions of its maps.

During the year work was done on 35 topographic bases. Twenty-two topographic bases were printed and eighteen reprinted to a total of 350,000 copies.

Aeronautical data were compiled for 33 sheets, revised for 33 sheets and a second revision made for 16 sheets. Sixty-nine red overprint plates were prepared and overprinted on a total of 166,000 charts.

The air charts in Canada are somewhat similar in design and in the conventional signs used to those of the United States. They are dissimilar in many respects to those in use by the Royal Air Force. In order to assist in training

pilots for overseas service, two charts designed to the specifications of the latter were prepared and one is now printed. One of the charts is of an area in Eastern Canada and the other of an area in the West.

A provisional chart of a large part of southwestern Ontario was prepared and printed in order to supply the demand until the regular issues became available.

Other miscellaneous jobs performed during the year included the revision of the four-mile to one-inch sheets Lac Seul and Carroll Lake numbered 52K and 52M in the National Topographic Series, the completion for printing of the two-mile to one-inch, Saint John and Thessalon sheets numbered 21G-SW and 41J-SW and the one-mile to one-inch sheet Renfrew numbered 31F-7. The one-mile to one-inch sheet Sumas numbered 92-G/1 was prepared for a preliminary edition. The following sheets of the Sectional Map of Canada, scale three miles to one inch, were revised by the preparation of a black overprint plate: Edmonton, No. 315; Medicine Hat, No. 66; Macleod, No. 65; Moose Jaw, No. 69; Swift Current, No. 68; and Lethbridge, No. 15. The above map sheets were all required for some phase of war work. A start was also made on the revision of the Northwest Territories sheet No. 2 on a scale of 35 miles to one inch.

A number of new maps were indexed into the Map Library during the year and all the material collected in the preparation of air navigation charts was filed.

All contentious place-names that are submitted to the Geographic Board are passed through this Division for consideration and recommendation.

Survey Records and Distribution

Survey Records.—This Division has charge of the registration and recording of all survey notes and plans affecting Dominion lands and interprovincial boundaries; the supplying of information relating to these records, and the storing and distribution of the official plans of townships, townsites and settlements. Up to the end of the fiscal year 22,178 books and 39,728 plans had been placed on record. During the year 656 technical requests were dealt with and 6,304 official plans were distributed.

Distribution of Maps and Publications.—This Division now distributes not only all the publications and the topographical and geographical maps issued by this Map Service, but also the maps which were issued by what was formerly the National Development Bureau, the topographical and geographical maps issued by the Bureau of Geology and Topography of this Department, and all the topographical and other maps issued by the Geographic Section, Department of National Defence, except the special military maps which are not available to the public. A price has been set on all these maps and on all books, reports, and pamphlets, except certain technical publications intended only for technical officials of the Government, surveyors, engineers, and scientific organizations. At the present time the Division has nearly 1,300 different maps for distribution. During the past fiscal year there were distributed 257,101 maps and 3,760 publications. In carrying on this work 20,603 letters and requests were dealt with.

The number of maps distributed during the last twelve months is by far the largest ever distributed by this Service in any one year. The reason for this increase is the great demand from the Royal Canadian Air Force and from the other Departments and allied organizations engaged in the war effort. During the year 22 new air navigation charts were published.

In addition to the urgent work of supplying maps for war purposes which is given special priority, the regular work of supplying maps to the various Federal and Provincial Government departments, business firms, tourists, and the general public has been attended to with as little delay as possible.

Map Publication

This Division makes the finished drawings of maps and plans for reproduction, photographs these drawings to the scale of publication, makes the photo-litho zinc plates, and prints the editions. The maps published during the year and those in course of preparation are shown in a separate list. While most of the work done was in connection with air navigation charts, it will be noted that some work was also done for other branches of the Department as well as for other Federal Departments. The total number of copies of maps printed was approximately 642,800 necessitating nearly 3,143,300 impressions, as most of the maps were printed in several colours.

The work performed in the Photo-Mechanical Division included: wet plate negatives, 993; photo-lithographic plates, 691; contact prints and enlargements, 3,626; line-cuts, 2; vandyke prints, 2,681; blue printing, 166,929 square feet; vandyke printing, 3,762 square feet; photostat work, 7,597 sheets. Much of this work was done for other branches of the Department and for other Federal Departments.

Owing to the retirement of the departmental bookbinder on June 12, 1940, the work of map-mounting and book-binding was carried on to a considerably lesser degree than in previous years. The work done during the year included: books bound or repaired, 12; maps mounted, 216; maps mounted with rollers, 6; binders made, 48.

Board of Examiners for Dominion Land Surveyors

The Dominion Lands Surveys Act makes provision for a Board of Examiners who will set examination papers and will look into the qualifications of those applying for preliminary and final service as Dominion land surveyors.

The Board of Examiners meets, as required, in each year, examinations under normal conditions being held in February and May. During the last two or three years preliminary and final examinations have been held in February only.

During the year 1940-41 the Board conducted meetings throughout the period February 10 to March 11 in connection with examinations being held at Montreal, Winnipeg, and Edmonton. Twenty-one candidates presented themselves for the preliminary examination, of whom seven were successful. There was one candidate at the final examination who was successful.

List of Map Sheets of the National Topographic Series and of the Sectional Map Series Issued 1940-41 and in Hand on March 31, 1941

Issued 1940-41

Province	No.	Series	Name	Scale (in miles to 1 inch)	Latitude	Longitude	Remarks
Newfoundland.	1/NW..	N.T....	Avalon-Burin...	8	46° 00′ to 48° 00′	52° 00′ to 56° 00′	(a) Aeronautical—advance print
	2/SW.....	N.T....	Notre Dame-Bonavista.....	8	48° 00′ to 50° 00′	52° 00′ to 56° 00′	(a) Aeronautical
	11/NE	N.T...	La Poile-Burgeo.....	8	46° 00′ to 48° 00′	56° 00′ to 60° 00′	(a) Aeronautical and one red overprint
	12/SE	N.T...	St. Georges-White Bay....	8	48° 00′ to 50° 00′	56° 00′ to 60° 00′	(a) Aeronautical
P.E.I.....	11/NW..	N.T. ..	Magdalen Islands—Charlottetown.....	8	46° 00′ to 48° 00′	60° 00′ to 64° 00′	(b) Aeronautical and two red overprints. Also reprint

List of Map Sheets of the National Topographic Series and of the Sectional Map Series Issued 1940-41 and in Hand on March 31, 1941—Continued

Province	No.	Series	Name	Scale (in miles to 1 inch)	Latitude	Longitude	Remarks
N.S.	11/SW	N.T.	Halifax-Louisburg	8	44° 00′ to 46° 00′	60° 00′ to 64° 00′	(b) Aeronautical and two red overprints; also reprint
	S. ½-21/SE. N. ½-20/NE.	N.T.	Yarmouth-Windsor	8	43° 00′ to 45° 00′	64° 00′ to 68° 00′	(b) Aeronautical and three red overprints; also reprint
N.B.	21-G/15	N.T.	Fredericton	1	45° 45′ to 46° 00′	66° 30′ to 67° 00′	(a) Reprint
	21-G/SE	N.T.	Saint John	2	45° 00′ to 45° 30′	66° 00′ to 67° 00′	(b)
	21/NE	N.T.	Campbellton-Moncton	8	46° 00′ to 48° 00′	64° 00′ to 68° 00′	(b) Aeronautical and two red overprints. Also reprint
	N ½-21/SE. S. ½-21/NE.	N.T.	Fredericton-Moncton	8	45° 00′ to 47° 00′	64° 00′ to 68° 00′	(a) Aeronautical. Red overprint and also reprint
Que.	31-J/NW	N.T.	Mont-Laurier	2	46° 30′ to 47° 00′	75° 00′ to 76° 00′	(a) Reprint
	31-H	N.T.	Montreal	4	45° 00′ to 46° 00′	72° 00′ to 74° 00′	(a)
	12/NE	N.T.	Harrington-Belle Isle	8	50° 00′ to 52° 00′	55° 15′ to 60° 00′	(c) Aeronautical and one red overprint
	12/NW	N.T.	Mingan-Cape Whittle	8	50° 00′ to 52° 00′	60° 00′ to 64° 00′	(c) Aeronautical and one red overprint
	12/SW	N.T.	Anticosti Island	8	48° 00′ to 50° 00′	60° 00′ to 64° 25′	(c) Aeronautical. Red overprint
	N. ½-21/SW	N.T.	Megantic	8	45° 00′ to 46° 00′	68° 00′ to 72° 00′	(a) Aeronautical. Reprint and one red overprint
	22/NE	N.T.	Clarke City-Mingan	8	50° 00′ to 52° 00′	64° 00′ to 68° 00′	(c) Aeronautical. Red overprint
	22/SE	N.T.	Gaspe	8	48° 00′ to 50° 00′	64° 00′ to 68° 00′	(b) Aeronautical and two red overprints. Also reprint
	31/NW	N.T.	Upper Ottawa River	8	46° 00′ to 48° 00′	76° 00′ to 80° 45′	(b) Aeronautical and two red overprints
Ont.	31-F/7	N.T.	Renfrew	1	45° 15′ to 45° 30′	76° 30′ to 77° 00′	(a)
	31-D/NW	N.T.	Orillia	2	44° 30′ to 45° 00′	79° 00′ to 80° 00′	(b) Reprint
	41-H/SE	N.T.	Parry Sound	2	45° 00′ to 45° 30′	80° 00′ to 81° 00′	(b) Reprint
	52-C	N.T.	Rainy Lake	4	48° 00′ to 49° 00′	92° 00′ to 94° 00′	(b) Reprint
	52-D	N.T.	Rainy River	4	48° 00′ to 49° 00′	94° 00′ to 96° 00′	(b) Reprint
	52-E	N.T.	Kenora	4	49° 00′ to 50° 00′	94° 00′ to 96° 00′	(b) Reprint
	52-K	N.T.	Lac Seul	4	50° 00′ to 51° 00′	92° 00′ to 94° 00′	(b) Reprint
	31/SW	N.T.	Toronto-Ottawa	8	43° 30′ to 45° 00′	76° 00′ to 80° 00′	(a) Aeronautical and one red overprint. Also reprint
	31/SE	N.T.	Ottawa-Montreal	8	44° 00′ to 46° 00′	72° 00′ to 76° 00′	(a) Aeronautical. Red overprint and also reprint
	40/NE	N.T.	Windsor-Toronto	8	42° 00′ to 44° 00′	79° 00′ to 83° 00′	(a) Aeronautical and three red overprints. Also reprint
	42/SE	N.T.	Hearst-Cochrane	8	48° 00′ to 50° 00′	79° 15′ to 84° 00′	(b) Aeronautical. Two red overprints
	N. ½-42/SW. S. ½-42/NW.	N.T.	Nakina-Pagwa	8	49° 00′ to 51° 00′	84° 00′ to 88° 00′	(b) Aeronautical. Two red overprints and also reprint
	N. ½-52/SE. S. ½-52/NE.	N.T.	Sioux Lookout-Nipigon	8	49° 00′ to 51° 00′	88° 00′ to 92° 00′	(b) Aeronautical. Two red overprints and also reprint
	N. ½-52/SW. S. ½-52/NW.	N.T.	Kenora-Hudson	8	49° 00′ to 51° 00′	92° 00′ to 96° 00′	(b) Aeronautical. Two red overprints. Also reprint and a red overprint
Man.	72	Sect.	Brandon	3	49° 42′ to 50° 25′	98° 00′ to 100° 05′	(d)
	52-M	N.T.	Carroll Lake	4	51° 00′ to 52° 00′	94° 00′ to 96° 00′	(b) Reprint
	N. ½-62/SE. S. ½-62/NE.	N.T.	Brandon-Winnipeg	8	49° 00′ to 51° 00′	96° 00′ to 100° 00′	(a) Aeronautical. Red overprint and also reprint
	62-NE	N.T.	Neepawa-Gypsumville	8	50° 00′ to 52° 00′	96° 00′ to 100° 00′	(b) Aeronautical

List of Map Sheets of the National Topographic Series and of the Sectional Map Series Issued 1940-41 and in Hand on March 31, 1941—Continued

Province	No.	Series	Name	Scale (in miles to 1 inch)	Latitude	Longitude	Remarks
Sask.	17	Sect.	Cypress	3	49° 00′ to 49° 43′	108° 00′ to 110° 00′	(f) Reprint
	119	Sect.	Regina	3	50° 23′ to 51° 06′	104° 04′ to 106° 01′	(d) Reprint
	120	Sect.	Qu'Appelle	3	50° 23′ to 51° 08′	102° 00′ to 104° 06′	(d) Reprint
	168	Sect.	The Elbow	3	51° 05′ to 51° 48′	105° 59′ to 108° 08′	(d) Reprint
	170	Sect.	Yorkton	3	51° 07′ to 51° 48′	102° 00′ to 104° 08′	(d) Reprint
	218	Sect.	Saskatoon	3	51° 47′ to 52° 30′	106° 00′ to 108° 00′	(d) Reprint
	220	Sect.	Nut Mountain	3	51° 47′ to 52° 30′	102° 00′ to 104° 00′	(f) Reprint
	317	Sect.	Fort Pitt	3	53° 11′ to 53° 54′	108° 02′ to 110° 01′	(f) Reprint
	N. ½-62/SW. S. ½-62/NW.	N.T.	Indian Head-Brandon	8	49° 00′ to 51° 00′	100° 00′ to 104° 00′	(a) Aeronautical. Red overprint and also reprint
	62/NW	N.T.	Broadview-Dauphin	8	50° 00′ to 52° 00′	100° 00′ to 104° 00′	(b) Aeronautical and red overprint
	N. ½-72/SE. S. ½-72/N.E.	N.T.	Swift Current-Regina	8	49° 00′ to 51° 00′	104° 00′ to 108° 00′	(a) Aeronautical. Reprint and also one red overprint.
	72/NE	N.T.	Moose Jaw-Watrous	8	50° 00′ to 52° 00′	104° 00′ to 108° 00′	(b) Aeronautical and two red overprints. Also reprint
	72/NW	N.T.	Hanna-Kindersley	8	50° 00′ to 52° 00′	108° 00′ to 112° 00′	(b) Aeronautical and two red overprints
	73/SE	N.T.	Saskatoon-Prince Albert	8	52° 00′ to 54° 00′	104° 00′ to 108° 00′	(b) Aeronautical
	73/SW	N.T.	Wainwright-Battleford	8	52° 00′ to 54° 00′	108° 00′ to 112° 00′	(b) Aeronautical and two red overprints. Also reprint
Alta.	82-J/16	N.T.	Calgary S.W.	1	50° 45′ to 51° 00′	114° 00′ to 114° 30′	(a) Reprint
	82-P/4	N.T.	Calgary N.E.	1	51° 00′ to 51° 15′	113° 30′ to 114° 00′	(a) Reprint
	14	Sect.	Pincher Creek	3	49° 00′ to 49° 43′	114° 00′ to 116° 02′	(f) Reprint
	54	Sect.	Porcupine	3	49° 41′ to 50° 24′	113° 59′ to 116° 04′	(f) Reprint
	66	Sect.	Medicine Hat	3	49° 41′ to 50° 24′	110° 00′ to 112° 04′	(d) Reprint
	114	Sect.	Calgary	3	50° 23′ to 51° 06′	114° 00′ to 116° 05′	(d) Reprint
	115	Sect.	Blackfoot	3	50° 23′ to 51° 06′	112° 04′ to 114° 00′	(d) Reprint
	116	Sect.	Rainy Hills	3	50° 23′ to 51° 06′	110° 00′ to 112° 06′	(f) Reprint
	215	Sect.	Red Deer	3	51° 47′ to 52° 30′	112° 00′ to 114° 00′	(d) Reprint
	315	Sect.	Edmonton	3	53° 11′ to 53° 54′	112° 03′ to 114° 00′	(d) Reprint
	412	Sect.	Wapiti	3	54° 34′ to 55° 18′	117° 59′ to 120° 00′	(f) Reprint
Alta.	414	Sect.	Saulteux	3	54° 35′ to 55° 18′	114° 00′ to 116° 00′	(e) Reprint
	N. ½-72/SW. S. ½-72/NW.	N.T.	Medicine Hat-Maple Creek	8	49° 00′ to 51° 00′	108° 00′ to 112° 00′	(a) Aeronautical. Two red overprints. Also reprint and a red overprint
	82/SE	N.T.	Cranbrook-Lethbridge	8	48° 00′ to 50° 00′	112° 00′ to 116° 00′	(b) Aeronautical. Red overprint and also reprint.
	82/NE	N.T.	Banff-Bassano	8	50° 00′ to 52° 00′	112° 00′ to 116° 00′	(b) Aeronautical and one red overprint
	83/SE	N.T.	Red Deer-Edmonton	8	52° 00′ to 54° 00′	112° 00′ to 116° 00′	(b) Aeronautical and two red overprints
B.C.	82/SW	N.T.	Okanagan-Kootenay	8	48° 00′ to 50° 00′	116° 00′ to 120° 00′	(b) Aeronautical. Two red overprints
	92/SE	N.T.	Victoria-Vancouver	8	48° 00′ to 50° 00′	120° 00′ to 124° 00′	(b) Aeronautical. One red overprint

In Hand—March 31, 1941

Newfoundland	1/NW	N.T.	Avalon-Burin	8	46° 00′ to 48° 00′	52° 00′ to 56° 00′	(a) Aeronautical
	13/SE	N.T.	Battle Harbour-Cartwright	8	52° 00′ to 54° 00′	55° 15′ to 60° 00′	(c) Aeronautical
	13/NE	N.T.	Hamilton-Hopedale	8	54° 00′ to 56° 00′	57° 00′ to 61° 00′	(c) Aeronautical
N.S.	11-D	N.T.	Halifax-Sheet Harbour	4	44° 00′ to 45° 00′	62° 00′ to 64° 00′	(b)
Que.	22-D/5, 6, 11 & 12	N.T.	Chicoutimi	2	48° 15′ to 48° 45′	71° 00′ to 72° 00′	(b)
	31-I/NE	N.T.	Grand'Mere	2	46° 30′ to 47° 00′	72° 00′ to 73° 00′	(b)
	31-M	N.T.	Timiskaming	4	47° 00′ to 48° 00′	78° 00′ to 80° 00′	(b)
	12/NW	N.T.	Mingan-Cape Whittle	8	50° 00′ to 52° 00′	60° 00′ to 64° 00′	(c) Aeronautical—Reprint

List of Map Sheets of the National Topographic Series and of the Sectional Map Series Issued 1940-41 and in Hand on March 31, 1941—Concluded

In Hand—March 31, 1941—*Concluded*

Province	No.	Series	Name	Scale (in miles to 1 inch)	Latitude	Longitude	Remarks
Que.	N. ½-21/SW.	N.T.	Megantic	8	45° 00′ to 46° 00′	68° 00′ to 72° 00′	(*a*) Aeronautical—Reprint
	21/NW	N.T.	Quebec-Edmundston	8	46° 00′ to 48° 00′	68° 00′ to 72° 00′	(*a*) Aeronautical
	22/SW	N.T.	Chicoutimi-Rimouski	8	48° 00′ to 50° 00′	68° 00′ to 72° 00′	(*b*) Aeronautical
	31/NE	N.T.	Parent-Three Rivers	8	46° 00′ to 48° 00′	72° 00′ to 76° 00′	(*b*) Aeronautical
Ont.	41-J/SW	N.T.	Thessalon	2	46° 00′ to 46° 30′	83° 00′ to 84° 00′	(*b*)
	41/SE	N.T.	Manitoulin-Owen Sound	8	44° 00′ to 46° 00′	80° 00′ to 84° 00′	(*b*) Aeronautical
	41/NE	N.T.	Chapleau-Sudbury	8	46° 00′ to 48° 00′	80° 00′ to 84° 00′	(*b*) Aeronautical
	41/NW	N.T.	Michipicoten-Sault Ste. Marie	8	46° 00′ to 48° 00′	84° 00′ to 88° 00′	(*b*) Aeronautical
	42/SW	N.T.	Geraldton-White River	8	48° 00′ to 50° 00′	84° 00′ to 88° 00′	(*b*) Aeronautical
	52/SE	N.T.	Ignace-Fort William	8	48° 00′ to 50° 00′	88° 00′ to 92° 00′	(*b*) Aeronautical
	52/NE	N.T.	Sioux Lookout-Armstrong	8	50° 00′ to 52° 00′	88° 00′ to 92° 00′	(*b*)
	52/SW	N.T.	Kenora-Fort Frances	8	48° 00′ to 50° 00′	92° 00′ to 96° 00′	(*b*)
Sask.	68	Sect.	Swift Current	3	49° 42′ to 50° 24′	106° 00′ to 108° 04′	(*d*) Reprint
	69	Sect.	Moose Jaw	3	49° 42′ to 50° 24′	104° 02′ to 106° 00′	(*d*) Reprint
	73/SE	N.T.	Saskatoon-Prince Albert	8	52° 00′ to 54° 00′	104° 00′ to 108° 00′	(*b*) Aeronautical—Red overprint
Alta.	82-O/SW	N.T.	Banff	2	51° 00′ to 51° 30′	115° 00′ to 116° 00′	(*a*)
	84-N/NE	N.T.	Ells River	2	59° 30′ to 60° 00′	116° 00′ to 117° 00′	(*c*)
	15	Sect.	Lethbridge	3	49° 00′ to 49° 42′	112° 00′ to 114° 00′	(*d*) Reprint
	214	Sect.	Rocky Mountain House	3	51° 47′ to 52° 30′	114° 00′ to 116° 00′	(*f*) Reprint
B.C.	92-G/1	N.T.	Sumas	1	49° 00′ to 49° 15′	122° 00′ to 122° 30′	(*a*)
	93-A/5	N.T.	Beaver Creek	1	52° 15′ to 52° 30′	121° 30′ to 122° 00′	(*a*)
	93-A/6	N.T.	Horsefly	1	52° 15′ to 52° 30′	121° 00′ to 121° 30′	(*a*)
	82-O/NW	N.T.	Barrier Mountain	2	51° 30′ to 52° 00′	117° 00′ to 118° 00′	(*a*)
	92-B/NW	N.T.	Victoria	2	48° 30′ to 49° 00′	123° 00′ to 124° 00′	(*a*)
	93-K/SE	N.T.	Fraser Lake	2	54° 00′ to 54° 30′	124° 00′ to 125° 00′	(*b*)
	82/SW	N.T.	Okanagan-Kootenay	8	48° 00′ to 50° 00′	116° 00′ to 120° 00′	(*b*) Aeronautical. Reprint
	92/SE	N.T.	Victoria-Vancouver	8	48° 00′ to 50° 00′	120° 00′ to 124° 00′	(*b*) Aeronautical. Red overprint
	92/SW	N.T.	Nootka-Nanaimo	8	48° 00′ to 50° 00′	124° 00′ to 128° 00′	Aeronautical
	92/NW	N.T.	Campbell River-Rivers Inlet	8	50° 00′ to 52° 00′	124° 00′ to 128° 30′	Aeronautical
	103/SE	N.T.	Queen Charlotte Island—Bella Bella	8	52° 00′ to 54° 00′	128° 00′ to 133° 00′	Aeronautical
	103/NE	N.T.	Prince Rupert-Stewart	8	54° 00′ to 58° 00′	128° 00′ to 133° 00′	Aeronautical
N.W.T.	85/NE. & NW.	N.T.	Rae	8	62° 00′ to 64° 00′	112° 00′ to 120° 00′	(*e*)

NOTE.—Work performed on the sheets marked "In Hand" ranges throughout the various stages from the commencement of the compilation in the office to the preparation of the final lithographic plates for printing. Some sheets upon which very little work has so far been done are not included in the above list.

Where a map sheet extends into more than one province, it is listed under one province only.

Under the column of "Remarks" the following are the meanings attached to the symbols used:—

(*a*) National Topographic Series—Standard Edition—Topographical information complete.

(*b*) National Topographic Series—Provisional Edition—Topographical information complete or nearly so (except for contours), over all or greater part of sheet.

(*c*) National Topographic Series—Exploratory Edition—Topographical information from exploration surveys, or where control is inadequate, no contours or contours conjectural only.

(*d*) Sectional Map Series—New Series Edition—Detailed topographical information in eight colours, including contours.

(*e*) Sectional Map Series—Intermediate Series Edition—Topographical information in five colours, not so complete, contours, when shown, usually approximate only.

(*f*) Sectional Map Series—Old Series Edition—General topography only, in from one to four colours.

List of Miscellaneous Map Sheets and Plans Issued 1940-41 and in Hand March 31, 1941

ISSUED 1940–41

Province	Map	Scale (in miles to 1 inch)	Remarks
P.E.I.	Prince Edward Island	3·95	Reprint.
N.S.	Truro	3·95	Reprint.
Que.	Ottawa-Gatineau	1	Reprint.
	Montreal-Quebec	7·89	Reprint.
Ont.	Borden-Windsor	8	Aeronautical—Provisional Edition.
	Borden-Windsor	8	Aeronautical.
Man.	Portage la Prairie	8	Aeronautical.
General	Index to Air Navigation Charts		
	Index to National Topographic Series—Quebec and Maritimes		
	Index to National Topographic Series—Manitoba and Saskatchewan		
	Dominion of Canada	100	Reprint.
	Cost Sheet for Photo-Mechanical Division		
	Preliminary Certificates for Board of Examiners for Dominion Land Surveyors		
	Fourteen Township Plans	½	Reprints.
	Precise Water Levels—Hydrographic Service		
	Loose Leafs for Field Book for Hydrographic Service		
	Ninety-seven Hydrographic Charts		
	Map of Canada — R.C.A.F. Training Schools	100	
	Recruiting Centres under British Commonwealth Air Training Plan		
	Training Schools, Depots, and Recruiting Centres		
	Designated Civil Airways of Canada		
Miscellaneous	Banff Townsite		Lands, Parks and Forests Branch.
	Yellowknife Settlement		" " "
	Fire Hazard Chart—White Birch, Poplar Graphs		" " "
	Cutover Lands—Lake Edward District		" " "
	Eastern Arctic Patrol		" " "
	Gravity Map of Canada		Dominion Observatory.
	Township Forms		Department of Agriculture.
	Ottawa District		Air Raid Precautions Committee.

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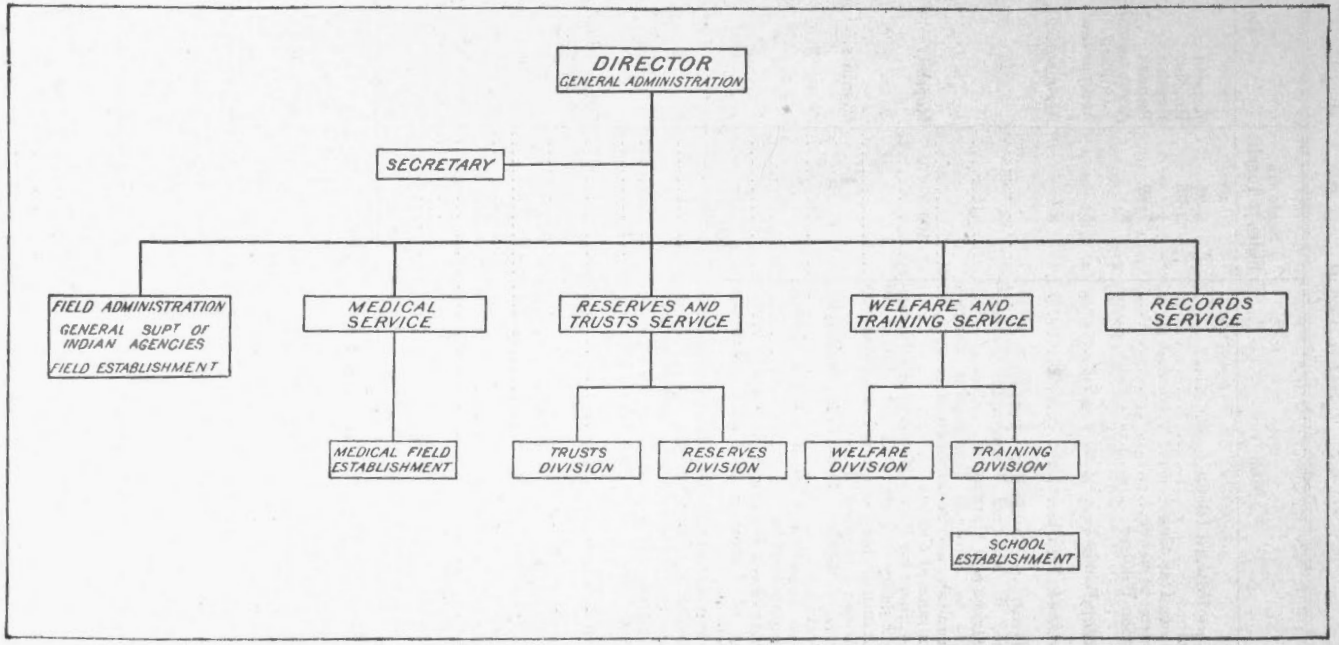
Ont.	Camp Borden	8	Aeronautical.
	London	8	Aeronautical.
Man.	Manitoba South	16	
Alta.	Alberta North	16	
	Alberta South	16	
N.W.T.	Northwest Territories, Sheet No. 1	35	
	Northwest Territories, Sheet No. 2	35	
Yukon	Yukon Territory	16	Reprint.
General	Quebec and Maritimes	35	Reprint.
	Ontario	35	Reprint.
	Prairie Provinces	35	Reprint.
	British Columbia	35	Reprint.
	Map of North Atlantic		
	English Channel		for Royal Canadian Air Force.
	Mercator Projection		" " "
	Conventional Signs for Air Navigation		
	Index to National Topographic Series—British Columbia and Alberta		
	Four Township Plans		
	Eighteen Hydrographic Charts		



Organization Chart, Indian Affairs Branch.

INDIAN AFFAIRS BRANCH

Dr. H. W. McGILL, DIRECTOR

Employment conditions among the Indians are showing a marked improvement. A review of the year ended March 31, 1941, indicates that greater opportunities for employment have become available to Indians coincident with the increased demands for labour caused by the war. This has resulted in Indians being absorbed into the building trades, structural steel work—in which they have long demonstrated their ability as skilled workers—and many other forms of industry. There has been a heavy demand for Indians for ranch labour in British Columbia because of enlistment of white labourers; and logging, pulpwood cutting, and mining have provided additional sources of employment. The year was not a remunerative one for the farming Indians but those who had cattle for sale received good returns. Profits from hunting and trapping were the result of the quality rather than the quantity of the fur trapped and higher prices.

An analysis of general conditions in the various parts of the country shows that in the Northwest Territories with the exception of beaver and white fox, fur has not been plentiful during the past season. Large beaver pelts brought prices considerably above the average. Fishing was good and large quantities were caught and dried for later use. The Indians had a successful autumn hunt for caribou and moose, and wild duck and geese were seen in exceptionally large numbers.

An ever increasing interest is being taken by the Indians of British Columbia in agriculture and stock-raising and they are being urged to make these occupations their mainstay. Crops were good and all agricultural operations can be considered as having been relatively successful. Those engaged in cattle-raising had a successful year and this industry continues to expand. The Indians have been making more adequate provision of hay for the feeding season and otherwise are giving better attention to their cattle. They are continually encouraged to establish permanent hay meadows instead of sowing grain for fodder.

In horse-breeding the Indians lose considerable revenue by failing to take advantage of their resources of land and their natural ability to produce draught animals suitable for farm work. In some areas of the province they have very good horses but in many instances they possess a large number of the worthless scrub type. Steps taken two years ago to inoculate Indian horses against encephalomyelitis has prevented any outbreak of this disease among the horses.

In the Stikine Agency and to a lesser extent in the Babine, Stuart Lake, and Williams Lake Agencies returns from trapping were fairly good, but in other districts the catch reported was small. Some years ago the Province of British Columbia adopted a system of registration of all trap-lines, giving everyone concerned an opportunity of filing his claim. A considerable amount of work has been done during the past year to adjust trap-line problems among the Indians and to improve generally the trap-line records.

Increasing competition in the labour market has militated against the Indians earning as much as formerly in the canneries and reduction plants. The canning of herring has opened up a new avenue of employment for Indian women. The returns from salmon fishing in some sections of the northern and central coast areas compared favourably with those of 1940 but in other sections the catch was disappointing. The Indians are being encouraged to engage in

halibut fishing in an endeavour to offset diminishing returns from salmon fishing because of the severe competition from foreigners. Reports from clam digging would indicate that earnings from this source were greater than for the past two years.

A very successful contract was carried out by the Indians of the Bella Coola Agency under which they cut and sold 1,788,540 feet board measure of logs. When this undertaking was completed, all indebtedness on equipment costing nearly $10,000 had been paid off and employment had been given to 41 Indians with an average return to each of $135. This operation salvaged timber which would otherwise have been a total loss and would have been a detriment to the reserve in a short time.

A potato growing project undertaken in the New Westminster Agency in 1938 has now increased to an area of 60 acres which in 1940 yielded in excess of 300 tons of potatoes. In this undertaking the Indians were competing in a well organized field as the potato grown in the Pemberton area is a highly developed specimen, and commands a premium on the Vancouver market.

Crops were only fair at the agencies in Alberta because of dry weather and hot winds early in the year and unfavourable weather conditions at threshing time. For these reasons harvesting was delayed in some instances well into the winter, and early rain, sleet, and snow lowered the grade of the grain. A very satisfactory crop was taken in the Peigan Agency and good results were obtained on the small acreage in the Lesser Slave Lake Agency. The irrigated section of the Blackfoot Agency has been increased and individual Indians harvested good crops from sections which they worked. A new community field of 100 acres at the Stony Agency produced a good oat crop. Additional storage space was necessary on account of the "quota" system of selling grain. Several grain bins which had not been in use for some years were repaired and new bins built at the Blackfoot Agency.

The number of herds of high-grade cattle owned by the Indians of Alberta is increasing gradually. Grazing is sufficient at most agencies. New stock-watering dams constructed during the autumn of 1939 on the Blood and Peigan Reserves have been of immeasurable value to the stock. A special herd started at the Blood Agency, with the object of supplying all meat rations for destitute Indians of that agency, has reached a point where it may now be expected to pay its own way.

The quality and breed of the Indian horses in this province are improving because of the use of better sires purchased by the Indians from outside the reserves. An effort is being made to persuade the Indians to raise a smaller number of general purpose horses rather than the many small-sized ponies which in past years they have considered it necessary to possess. If successful this innovation should prove profitable as the larger animals command higher prices.

Fish were plentiful and the Indians had an abundance for home consumption, but commercial fishing was not remunerative as prices were very low. In the northern part of the province the fur catch was fairly good and there was no lack of big game for food.

At the end of the winter of 1940-41 the Indians of Saskatchewan were in a better condition than they had been for some years past. Fair crops were threshed in several agencies and at none was the crop a complete failure.

It has been the policy of the Indian Affairs Branch to increase the live-stock holdings of the Indians and while the process is slow the effort is showing results. In the autumn of 1940 the value of cattle sold and used for beef by the Indians in Saskatchewan amounted to some $60,000. This asset, together with large sales of wood which were made in the central part of the province, were factors in providing the means of livelihood during the winter. Good management on the part of the Indian agents contributed to the value of the transactions and the direct result was a decrease in the amount of relief provided.

The Homemakers' Clubs in this province are a practical undertaking that is having a beneficial effect upon the Indians. The household knowledge acquired is clearly evident in the improved condition of their homes and general mode of life. There are now twenty-five of these clubs in Saskatchewan.

Work has been more plentiful for the Indians of Manitoba and living conditions have consequently shown a marked degree of improvement. In spite of dry weather and early frost, heavy crops were harvested in some districts. Coarse grain gave small returns owing to lack of rain, and the continued dry seasons rendered some of the hay meadows useless.

In most districts trapping has been good and the pelts, being of a better grade than usual, have brought higher prices. The muskrat project near The Pas has made steady progress and this undertaking is making a distinct contribution towards the welfare of the Indians. The Indians profited by their fishing as the prices they received for their catch were higher than for 1939-40.

It was with much satisfaction that the hunting Indians of Ontario received news of an open beaver season for three weeks in December, with a bag limit of 10 beaver. While most of the hunters returned with a fair catch, only a limited number took their quota. High prices, however, made their effort decidedly worthwhile as good pelts brought as much as $35 a piece. The muskrat catch showed an increase of from 50 to 100 per cent over recent years and excellent prices were obtained. Indians from at least one agency successfully trapped lynx, and the mink catch was satisfactory both in quantity and quality.

The Government of Ontario gave notice of the raising of the wolf bounty to $25. As a large percentage of the pelts and consequent claims for bounty come from Indians, the province was anxious that they should be informed of the higher bounty and of the Government's desire to control the menace of wolves to the northern game during the war years. Word was circulated among the Indians without delay.

Fishing proved very remunerative as the catch was good and was disposed of at better prices than usual. Other excellent sources of income were contracts secured for logging and for pulpwood cutting and peeling.

The cultivation of larger areas of land and the extension of vegetable gardens were emphasized in the spring of 1940. The suggestion was taken up with enthusiasm by the Indians of most of the farming agencies, many of whom were glad to co-operate in an effort to provide more adequately for their needs and to meet the increasing cost of living. In many sections of the province, however, the weather was unfavourable both early in the year and during the harvest. While fine fields of grain were grown, storms and rain in June and July almost inundated the land and in a number of cases wheat was suitable for feed only. The hay crop was abundant and the gardens in most instances were a success. Although good crops of wild rice were gathered any advantage to the Indians was offset by low prices. Blueberry picking, upon which the Indians usually count for a little extra money, was also rather disappointing.

The hunting and trapping Indians of Quebec did fairly well, in fact their returns were better than for the past few years. The Indians of northern Quebec and those along the North Shore depend entirely upon wild life for a living. The special effort made among the farming Indians at St. Regis is being continued with success. An experiment in raising hogs and poultry at Pierreville is showing progress and it is intended to extend this venture to other agencies. On some reserves in the province excellent results have been obtained in growing garden vegetables and the Indians make good use of their surplus by canning them for winter use. The native handicrafts are being pursued by the Indians of several Quebec agencies with success both in manufacture and from a monetary viewpoint. Employment in industry and in lumber camps in the province and in the State of Maine has added considerably to the income of the Indians of some agencies with resulting improvement in general conditions.

Economic conditions among the Indians of the Maritime Provinces do not vary to any considerable extent. In Nova Scotia there has been a slow but steady improvement. There is more occasional work for the Indians and a greater demand for their wares. In New Brunswick a larger area of crops was planted than in 1939-40, but on account of the dry season the harvest was not any greater than usual. Opportunities for employment have been more frequent here also. In Prince Edward Island field crops and gardens showed an improvement over previous years.

War Services

Under the provisions of the National Registration Act Indians are required to register and at most agencies registrations progressed without difficulty. At some outlying points action was delayed until the Indians gathered for treaty or interest payments. Similarly Indians are liable for military training and have been called up for the usual periods. Enlistment has not been heavy as compared with the number of Indians who volunteered for service during the years 1914-1918. Nevertheless, in every part of the country they have shown a patriotic spirit and in some provinces enlistment of a high percentage of the adult male population has been recorded.

Over $7,000 contributed by the Indians has been received through headquarters, and it is known that other amounts have been donated directly by them to the various war funds. From all over Canada the Indians have manifested their loyalty in many ways and have shown a keen desire to assist in the war effort to the extent of their ability.

INDIAN HEALTH SERVICE

Throughout the winter there was a widespread and severe epidemic of influenza which resulted in many deaths, particularly among remote bands. This also resulted in lighting up many latent cases of tuberculosis, causing a sharp increase in deaths from this disease. There were sporadic outbreaks of whooping cough, measles, chicken-pox, mumps, and scarlet fever. In every outbreak steps were taken to control the spread of the disease.

Typhoid fever appeared at Waswanipi in northern Quebec and at Pemberton and New Westminster, British Columbia. Measures were taken promptly to vaccinate all Indians in the area with a result that only a few cases occurred.

There were two serious epidemics of diphtheria. At Hobbema, Indians concealed the death of a boy with the result that a widespread outbreak occurred. The Royal Canadian Mounted Police were called in to enforce quarantine and general inoculation with diphtheria toxoid was carried out. At Norway House, Manitoba, sporadic cases of diphtheria kept appearing among the Indians in the bush, until at one time there was a total of 42 cases. The Manitoba Department of Health loaned the services of an epidemiologist and a public health nurse and over 600 toxoid inoculations were carried out with the result that the disease was checked. The Department's medical officer at Norway House is continuing this campaign and about 2,000 Indians will be immunized.

There was an increase of 14 in the number of Indians in Provincial Mental Hospitals, bringing the total to 168. Maintenance of these patients costs approximately $65,000.

Marked interest has been shown by the medical profession in the results being achieved by the Department's trachoma specialist in the sulphanilamide treatment of trachoma. The disease has been checked in hundreds of cases and many Indians almost totally blind, have had at least partial vision restored.

Progress has been made in the Department's campaign against tuberculosis. An isolation unit of 15 beds was opened on Manitoulin Island. Bed capacity in the Fisher River Hospital was increased from 20 to 36 beds. Norway House Hospital capacity was increased from 16 to 24 beds. In British Columbia the Coqualeetza residential school at Sardis was reconstructed and equipped to become an up-to-date 175-bed sanitorium. The Department now has over 500 beds in its own institutions, the majority of which will be used for the treatment of tuberculosis. With the death rate from tuberculosis among Indians, more than ten times as high as among the white population, all these and many more beds are urgently needed. A total of 1,488 Indians received treatment in hospital for tuberculosis with an average of 530 under treatment.

The staff of the Indian Health Service has been considerably affected by the war, as many of the doctors have enlisted. This has necessitated rearrangements or new appointments in a large number of cases.

WELFARE AND TRAINING SERVICE

TRAINING

A table of pupil enrolment and attendance follows:—

Fiscal Year	Residential Schools		Day Schools		Total		
	Enrolment	Average Attendance	Enrolment	Average Attendance	Enrolment	Average Attendance	Percentage of Attendance
1931-32.....	8,213	7,400	8,950	5,707	17,163	13,107	76·36
1932-33.....	8,465	7,613	8,960	5,874	17,425	13,478	77·40
1933-34.....	8,596	7,760	8,852	5,592	17,448	13,352	76·52
1934-35.....	8,709	7,882	8,851	5,560	17,560	13,442	76·54
1935-36.....	8,906	8,061	9,127	5,788	18,033	13,849	76·79
1936-37.....	9,040	8,176	9,257	5,790	18,297	13,966	76·34
1937-38.....	9,233	8,121	9,510	5,978	18,743	14,099	75·22
1938-39.....	9,179	8,276	9,573	6,232	18,752	14,508	77·36
1939-40.....	9,027	8,643	9,369	6,417	18,396	15,060	81·87
1940-41.....	8,774	8,243	8,651	6,110	17,425	14,353	82·37

An encouraging feature of the work of this year was the progress made in the development of an educational program designed to meet the needs of an Indian population scattered over 9 provinces, and the Yukon and Northwest Territories. This Indian population includes the highly skilled steel workers of Caughnawaga, Quebec, the fishing and trapping Indians of the northern sections of the Dominion and the Pacific Coast, and the Indians engaged in extensive farming operations in Ontario and the Prairie Provinces.

The progress made at Indian day and residential schools in the Province of British Columbia has been particularly gratifying. In addition to the regular academic courses, special vocational courses have been successfully organized. These courses, for girls, consist of the treatment and spinning of locally grown wool and the knitting of woollen garments, Cowichan sweaters, and socks, dressmaking, fruit preserving, crochet work, and home management, and for boys, boat-building, auto mechanics, Indian arts and crafts, and elementary agriculture. The Koksilah, Inkameep, and Ste. Catherine schools have been outstandingly successful in the organization of these courses, all of which are based on the needs of the Indians on the adjoining reserves.

The teacher in charge of the Inkameep Indian day school, has succeeded in the dramatization of a number of Indian legends. The presentation of these at the Banff Drama School created a great deal of interest amongst Indian educationists in Canada and the United States. Mr. Walsh, in addition to these presentations, published during the year, in co-operation with his pupils, a booklet entitled "The Tale of the Nativity". This teacher has had a number of invitations to organize drama festivals in the United States.

An interesting experiment in fur ranching was undertaken at the Morley residential school, Alberta, when a small mink ranch was established 2 years ago. This ranch started with 6 mink, pelted 75 mink last year and still has on hand 50 mink as breeding stock. The principal of the school, in commenting on the work of the ranch, states: "The Indian boys have taken to this work in a very fine way and I believe that at least a dozen boys could find employment if they so desired among the large fur ranches in the vicinity of Calgary".

Toward the end of the year a representative of the Department spent 2 months at the schools in Alberta. This visit was arranged in an effort to bring the courses of study into conformity with the vocational opportunities on the reserves of the province. This is the first vocational survey that has been undertaken by the Department. If successful, it will be gradually extended to the other provinces of the Dominion.

The four-room classroom building, constructed at Alberni, British Columbia, as a unit of the residential school completed in 1940, was totally destroyed by fire in February, 1941. A fire which resulted in the destruction of the blacksmith and carpentry shops at the Kootenay residential school also occurred during the year.

A number of educational problems remain to engage the attention of the Department. One of these is the difficulty encountered in maintaining regular attendance of Indian children at day schools, even where transportation is available. An acute shortage of fully qualified teachers exists throughout the country, and it has become increasingly difficult to secure male teachers for Indian day schools in outlying districts. Too much stress can not be placed on the effect of this condition on the educational standards of Indian schools and upon the general progress of Indian pupils.

A textbook for use in Indian day schools, the subject matter of which emphasizes forestry and wild life conservation, was prepared during the year. This is the first textbook prepared and published by the Department.

Indian Education—Ordinary Expenditure, 1940-41

—	Day Schools	Residential Schools	General	Total
	$	$	$	$
Nova Scotia	9,781 75	28,792 19	.....	38,573 94
Prince Edward Island	793 20	.....	.....	793 20
New Brunswick	13,355 58	.....	.....	13,355 58
Quebec	50,881 45	13,442 84	.....	64,324 29
Ontario	111,421 32	270,137 32	.....	381,558 64
Manitoba	52,185 71	183,113 60	.....	235,299 31
Saskatchewan	33,140 40	274,047 29	.....	307,187 69
Alberta	1,081 81	320,909 67	.....	321,991 48
British Columbia	77,650 24	313,059 63	.....	390,709 87
British Columbia Schools Vocational Instruction	.....	.....	9,960 64	9,960 64
Northwest Territories	1,342 10	40,530 53	.....	41,872 63
Yukon	2,550 00	18,922 12	.....	21,472 12
Assistance to ex-pupils	.....	.....	400 89	400 89
Freight and express	.....	.....	23 97	23 97
Salaries and travel	.....	.....	7,969 26	7,969 26
Stationery	.....	.....	37,716 26	37,716 26
Tuition	.....	.....	25,553 45	25,553 45
Expended by Surveys and Engineering Branch for building and repairs to schools	.....	.....	9,230 74	9,230 74
Miscellaneous	.....	.....	280 12	280 12
	354,183 56	1,462,955 19	91,135 33	1,908,274 08

WELFARE

Relief and welfare costs for the year show a reduction amounting to $101,842.10. This is the most substantial reduction that has taken place at any time in recent years.

An effort has been made in recent years to encourage reafforestation on a number of reserves. It is gratifying to report that a steadily increasing number of Indian bands are cooperating with the Department in the extension of this work. Toward the close of the year 15,000 trees were secured from the Ontario Forestry Station and planted on suitable lands at the Caradoc Reserve. A start was also made at the Moravian Agency, where 2,000 trees were planted. The trees at this reserve are designed to provide windbreaks and additional shelter for Indian homes.

An attempt has been made in the Prairie Provinces to adjust our farming program which should result in greater emphasis on subsistence farming. Indians have been encouraged to produce crops for home consumption rather than for sale and to keep live stock—cows, pigs, and sheep—in sufficient numbers to provide the meat necessary for domestic consumption.

Relief and welfare costs in British Columbia remain low and appear to have reached a figure when further reductions can scarcely be expected, if adequate provision is to be made for the old and physically incapacitated members of the bands. Employment conditions in the lumbering and fishing industries have been, for the most part, satisfactory. The number of Indians engaged in agriculture has shown a substantial increase. Late in the year an interesting project was undertaken at the Seabird Island Indian Reserve, where an experimental plot of five acres was seeded to fibre flax. The seed for this experiment was secured from the Agassiz Experimental Farm.

The following is a statement of welfare expenditures by provinces for the year 1940-41:—

Welfare Expenditures by Provinces, 1939-40 and 1940-41

Province	1940-41	1939-40	Province	1940-41	1939-40
	$ cts.	$ cts.		$ cts.	$ cts.
Nova Scotia	70,850 52	75,948 48	British Columbia	104,006 68	107,487 25
Prince Edward Isld	6,536 17	7,534 59	Northwest Territor's	21,938 18	23,823 13
New Brunswick	48,506 52	65,294 79	Yukon	12,913 88	12,453 68
Quebec	200,636 46	216,956 06	Triennial Clothing	6,340 55	3,485 08
Ontario	126,471 26	141,693 65	Miscellaneous	23,142 18	24,910 13
Manitoba	93,518 42	107,045 45	Handicraft	4,874 64	.....
Saskatchewan	94,647 13	102,712 56			
Alberta	68,545 75	95,425 59		882,923 34	984,770 44

HANDICRAFT

Substantial progress has been made in the marketing of handicraft products and in the promotion of handicraft projects on a number of eastern reserves.

Arrangements have been made with two well established wholesale houses for the marketing of Indian handicraft products such as split-ash and sweet-grass baskets, carved figures, small birch bark canoes and hand-loom weaving products such as scarves, ties, and rugs. These wholesale houses have experienced no difficulty in disposing of these products and the demand appears to be growing from month to month. In addition to this new outlet, a number of the

more progressive Indians, profiting by the instruction and supervision given by the Department, have been able during the year to secure a large number of orders for themselves and have made shipments direct to their customers.

Three handicraft exhibits were held during the year; at St. Helen's Island, near Montreal, at which $1,200 worth of craft-work was sold, at the Canadian National Exhibition, Toronto, and at Winnipeg. The amount received from the sale of goods at the Toronto and Winnipeg exhibits exceeded $10,000.

Certain Indian bands have been encouraged to open roadside stands on public highways, close to their reserves. These bands have been assisted by the transfer in care of the local Indian Agent of basketry products and novelties from other Indian reserves. The fact that these products are sold to the Indians at wholesale prices enables them to sell at a profit and place on display a variety of products likely to attract the attention of tourists.

The failure of Canadian and United States wholesale houses to secure adequate supplies of novelty products from Europe is reflected in the steadily increasing number of orders now reaching the Department.

Grants to Agricultural Exhibitions and Indian Fairs, 1940-41

New Brunswick—	
Fredericton Exhibition	$ 25 00
Gagetown Fair	25 00
Ontario—	
Ohsweken Agricultural Society, Brantford	225 00
Garden River Agricultural Society, Sault Ste. Marie	100 00
Caradoc United Indian Fair, Muncey	150 00
Caradoc United Ploughing Association	50 00
Manitoulin Island Unceded Agricultural Society	150 00
Snake Island Agricultural Society, Georgina Island	50 00
Thunder Bay Agricultural Association	250 00
Tyendinaga Agricultural Society	100 00
Plowing Matches	800 00
Field Prizes, Standing Crop Competitions	400 00
Garden Prizes, Standing Crop Competitions	300 00
Manitoba—	
Rossburn Agricultural Society	25 00
Manitoba Provincial Exhibition, Brandon	250 00
Garden Prizes, Standing Crop Competitions	75 00
Saskatchewan—	
Prince Albert Agricultural Society	400 00
Regina Agricultural & Industrial Exhibition Association, Limited	400 00
Garden Prizes, Standing Crop Competitions	75 00
Alberta—	
Calgary Exhibition	500 00
Edmonton Exhibition Association, Limited	400 00
Garden Prizes, Standing Crop Competitions	75 00
Fort Vermilion Agricultural Society	75 00
British Columbia—	
Bulkeley Valley Fall Fair, Smithers (Babine)	100 00
Farmers' Institute, Bella Coola	20 00
Cowichan Agricultural Society, Duncan	150 00
North & South Saanich Agricultural Society, Cowichan	50 00
Windermere and District Fall Fair, Kootenay	150 00
Vanderhoof Plowing Association (Stuart Lake)	50 00
Field Crops, Stuart Lake	100 00
Chilliwack Fair, New Westminster	50 00
Vancouver Fall Fair	500 00
Armstrong Fall Fair, Okanagan	250 00
International Folk Festival & Exhibition, Vancouver	50 00
General—	
The Canadian Handicrafts Guild	50 00
Handicraft Exhibits	450 00
	$6,870 00

CONSTRUCTION AND ENGINEERING WORKS

Agency Buildings and Structures

Repairs and improvements were carried out at practically all Indian Agencies in Canada. New buildings and structures were provided as follows:

Ontario.—A dock at Cedar Point, Christian Island Agency is in course of construction, funds being provided by the Indian Band.

Manitoba.—Storehouse for rations on Jackhead Reserve, Fisher River Agency; granary at Rolling River Reserve, Birtle Agency; ration house on Brokenhead Reserve, Clandeboye Agency; granary at Oak Lake Reserve, Griswold Agency.

Saskatchewan.—Gasoline storage in Qu'Appelle Agency; combined garage and repair shop at Kinistino Reserve, Duck Lake Agency; an addition to the warehouse on the Key Reserve, Pelly Agency.

Alberta.—Warehouse at Hav Lake. Lesser Slave Lake Agency; telephone line Ochapowace Reserve, Crooked Lake Agency.

British Columbia.—Materials for construction of float Sechelt Reserve No. 21, Vancouver Agency. Property in the town of Massett was purchased for an office for the Queen Charlotte Agency.

Northwest Territories.—Storehouses at Good Hope and McPherson, Fort Norman Agency.

Roads

Roads on Indian reserves requiring attention were improved, and the construction of the road through the Spanish River Indian Reserve leading to the town of Massey, Ontario, was continued. Stone was crushed during the winter for road work on the Caughnawaga Reserve and gravel was hauled and placed along the roads on the St. Regis Reserve, Quebec, in readiness for spring road improvements.

Bridges

A new bridge was constructed over Sucker Creek, Portage la Prairie Agency in co-operation with the Manitoba Provincial Government. Bridges and culverts were repaired on Indian reserves where required.

Water Supplies

New wells were drilled at Restigouche, Quebec; Lake Manitoba Reserve, Portage la Prairie Agency, Manitoba; Kinistino Reserve and at the Agency residence in the Duck Lake Agency; Sturgeon Lake Home Farm, Carlton Agency. A dam was constructed to hold water in a ravine for stock watering purposes, Carlton Agency; water was provided for stock at the File Hills Agency, Saskatchewan. Assistance was given to Indians of the Stuart Lake Agency in the sinking of a well. Existing wells were cleaned out or repaired at the Caradoc Agency, Ontario; Waywayseecappo Reserve, Birtle Agency, Manitoba; Carlton Agency, Red Pheasant, Sweet Grass, and Thunderchild Farms, Battleford Agency, Saskatchewan; Stony Agency, Alberta. Small water supply systems were repaired at the West Coast and Stikine Agencies, British Columbia.

Fencing

Fences were constructed or repaired at Agency farms and Agency property in the Fisher River and Portage la Prairie Agencies, Manitoba; Duck Lake Agency, Saskatchewan; Edmonton, Hobbema, and Stony Agencies, Alberta.

Drainage

The work of cleaning out the Suzanne drain on the Caughnawaga Reserve, Quebec, to prevent flooding of adjoining farm property of white farmers was commenced.

Irrigation Systems and Miscellaneous

Funds were transferred to the Surveys and Engineering Branch for the construction, maintenance, and repair of irrigation systems on Indian Reserves in British Columbia and for a number of other projects in connection with Agency operation. A list of the work carried out will be found in the report of that Branch.

New sets of batteries for the lighting plants were purchased for the Griswold Agency, Manitoba, and Onion Lake Agency, Saskatchewan. New furnaces were installed in the Agency residence, Crooked Lakes Agency, Saskatchewan, and in the Farming Instructor's House, Saddle Lake Agency, Alberta. Departmental boats requiring attention were repaired.

RESERVES AND TRUSTS SERVICE

RESERVES DIVISION

The policy of strictly limiting sales of Indian lands surplus to Indian needs has been continued, and applications received for the sale of such lands have been entertained only after careful consideration has been given to the future needs of the band concerned.

Land Sales and Leases

During the fiscal year, 11,782 acres of land regarded as surplus to the needs of the Indians were sold for cash and interest-bearing securities of a total value of $71,294.85. Cash payments totalling $52,791.45 were collected and added to Indian trust funds capital account. A total of $48,839.42 on account of interest, and $49,089.18 on account of principal was collected on older land sales and placed on deposit to the Indians' credit. Rentals collected from Indian lands under lease amounted to $145,964.37. There were, at the end of the fiscal year, 751 current land sales—a decrease of 67. During the year 70 patents were issued. Leasing contracts remained practically unchanged at 1,629.

In explanation of the increase in land sales during the year it is pointed out that one sale of more than 8,000 acres to the Province of Quebec for a total cash price of $30,000 accounts for the greater part of it. With this exception the sale of surplus Indian lands shows a sharp decrease from the previous year, which is in accordance with the policy of the Branch.

Adjustments Under Farmers' Creditors Arrangement Act

Fifty-nine applications for adjustment of land sale contracts were dealt with under the Farmers' Creditors Arrangement Act. Gross reductions in the aggregate amounted to $154,603.12 of which $120,128.62 was on account of principal and $34,474.50 on account of interest in arrears.

Fur Conservation

In co-operation with provincial administrations, the effort to attain greater fur production has made substantial progress. Fur developments under a policy of planned management for selected areas has already provided increased

employment in congenial pursuits and a measure of social security to hunters and trappers, both Indian and those of mixed blood; which gives promise of permanence.

The success of the public muskrat development projects in Manitoba is assured. For the past year over 400 families—113 of which were Indian—enjoyed an income in excess of $20 per month from this source alone. The Two Island Muskrat Rehabilitation Project at The Pas (160,000 acres) was carried through its second year with good results. This area should be in partial production in 1942 which is at least one year ahead of schedule.

In co-operation with the Province of Saskatchewan three new areas suitable for the propagation of both muskrats and beaver have been selected, and the first stage of a four-year development program has been satisfactorily completed. Preliminary examination of two other muskrat areas—one in Saskatchewan and the other in Alberta—was completed during the year with a view to their immediate development by the water control method.

The 12,000-square mile beaver preserve on the Nottaway River in the Province of Quebec has made satisfactory progress, the seed stock of beaver having more than doubled in two years. Another area east of the Peribonca River in the same province has been added during the year and the restoration work organized.

Restoration work has also proceeded in the Wood Buffalo National Park, Alberta, in connection with both muskrats and beaver.

A full program for the year ahead has been planned and will be proceeded with as funds are provided. The policy of acquiring trap-lines for the Indians of British Columbia and western Alberta has been continued with satisfactory results.

Indian Estates

The administrative responsibility in connection with the rights of succession and the distribution of property of deceased Indians has steadily increased. During the year in excess of 300 Indian estates have been administered under the direct supervision of the Service. It is noticeable that while the demands on the administrative machinery of the Department were at first confined to the more highly organized communities in Eastern Canada increasing demands are now being made for departmental assistance from the western bands where tribal custom has heretofore largely governed their personal affairs.

Timber and Forests

The administration of the timber and wood resources from Indian lands throughout Canada continues to be of great value to the Indian population. It is not only the source of direct revenue to them in building up their band funds, but furnishes employment and immediate income in the cutting and removal of the annual crop. Every effort is being made to conserve this asset to the end that the Indians themselves may enjoy not only the royalties or dues which forest products demand in the open market, but also the portion of its value attributable to the labour spent upon it.

Operations for the removal of such wood products are carried on under two distinct methods: one where commercial operators purchase the timber by tender under licence paying royalties and stumpage dues to the Indian owners; the other where the Indians under permit harvest and sell the crop themselves through the usual trade channels.

During the past year the quantities and value of timber utilized in the Indians' interest from their reserves, and an analysis of the quantities disposed of under each of the above methods were as follows:

Statement of Timber Cut From Indian Reserves, Season 1940-41

Province	Timber	Pulpwood	Fuelwood	Poles	Fish Stakes	Ties	Christmas Trees	Pit Props	Shingle Bolts
	f.b.m.	cords	cords	number	number	number	value	cords	cords
Nova Scotia	155,000	30	61	.....	.....	.....	.....	.....	.....
New Brunswick	.....	.....	.....	.....	.....	.....	.....	22	.....
Quebec	703,661	3,261	201	3,921	.....	1,738	.....	.....	.....
Ontario	8,477,344	21,681	4,340	1,117	4,071	15,242	.....	.....	.....
Manitoba	6,000	2,327	1,220	18	.....	.....	.....	.....	.....
Alberta	761,382	.....	29	400	.....	.....	.....	.....	.....
British Columbia	16,575,895	100	237	947	.....	.....	$1,318 41	.....	2,567
Totals	26,679,282	27,399	6,088	6,403	4,071	16,980	$1,318 41	22	2,567

Amount of saw timber cut under licence—18,444,239 f.b.m., having a total royalty value of	$ 41,890 07
Amount of timber cut by Indians—8,235,043 f.b.m. (saw timber together with other wood products) having a total royalty value of	34,311 60
Amount received from rentals, fees, etc.	3,529 60
Total royalty value	$ 79,731 27

A comparative statement of revenue from Indian forest products for the past five years is as indicated below:—

Comparative Statement of Revenue Derived From Timber Sales for the Past Five Years

—	From timber sold under licence	From timber cut under permit	From rentals	From licence and renewal fees	From interest	From timber cut under trespass	Total
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1936-37	33,123 30	12,951 04	1,838 60	149 00	362 25	479 54	48,903 73
1937-38	46,636 31	23,573 70	2,149 50	435 00	92 99	1,429 32	74,316 82
1938-39	25,941 02	17,511 72	2,308 60	138 00	155 59	142 50	46,197 43
1939-40	47,253 52	26,016 57	2,285 30	301 00	.....	493 24	76,349 63
1940-41	41,890 07	34,311 60	2,361 35	158 00	176 35	833 90	79,731 27

A slight increase in the gross returns has been realized and it is noted that this increase was effected from a substantially decreased quantity of timber products because of improved prices.

Forest Protection

The protection of the timber assets from destruction by fire is of constant concern to the Department. Fire losses during the year have been surprisingly low though the cost of prevention and suppression has increased somewhat over last year, the total expenditure being $7,689.40 as against $4,320.16 in the previous year.

Throughout the year a constant effort has been made to impress upon all Indian Agents and on the Indians themselves the value of the forests in the economic life of the Indians, and of the necessity for the wise utilization of this valuable asset. Particular attention has been devoted to the supervision of commercial operations, particularly with reference to brush disposal and the reduction of fire hazards, and the complete utilization of felled timber.

Mining

Interest in mining on Indian lands has shown little change during the year though there was a slight increase in the number of applications for prospectors' permits. The total amount of revenue derived from mining royalties, fees, and the sale of sand and gravel was $5,082.32.

The coal mine operated by the Indians of the Blackfoot Reserve in Alberta produced between 7,000 and 8,000 tons of coal, yielding a return of $20,187. Operations at the mine fell somewhat short of the year 1939-40 because of the mild winter and consequent lessened demand for coal.

Petroleum and Natural Gas

In view of the exceptional conditions prevailing during the past fiscal year, there has been a very considerable increase of interest in prospective oil and gas development on several reserves, particularly in the Province of Alberta. Deep drilling operations were begun on both the Blood and Sarcee Indian Reserves.

During the year a surrender of the petroleum and natural gas mining rights was obtained from the owners of the Saddle Lake Indian Reserve in Saskatchewan and from the Indians of the Stony Band covering their Reserves Nos. 142, 143, and 144. At the present time several leases are in effect with the prospect of deep drilling in 1941. Interest has been focused chiefly on the Blood Indian Reserve where several areas are now under lease on which either active preliminary investigations or actual drilling operations are being conducted.

Indian Enfranchisement

Under the provisions of the Indian Act, 36 enfranchisements were carried out during the fiscal year, comprising a total of 105 men, women, and children.

TRUSTS DIVISION

The division administered some 430 trust accounts belonging to Indian bands throughout the Dominion. The aggregate fund on March 31, 1941, totalled $14,415,830.64. Comparison with the previous year is as follows:—

	Capital	Interest
Trust balances March 31, 1941	$ 12,093,507 52	$ 2,322,323 12
Trust balances March 31, 1940	12,046,835 92	2,250,900 67
Increase in trust balances	$ 46,671 60	$ 71,422 45

Total receipts made up of earned interest, land sales, land rentals, mining dues, timber royalties, oil land rentals, and fines, and expenditures made up of capital and interest distribution, relief expenditures, band loans, agricultural assistance, road construction and repair, and enfranchisement, which reflect the transaction of Indian business through their band fund accounts during the year, were as follows:—

Total receipts credited to band funds	$ 1,372,201 01
Total expenditures paid from band funds	1,254,126 96
Excess receipts over expenditures	$ 118,074 05

Below is a statement of the larger items of expenditure for the fiscal years ended March 31, 1940, and March 31, 1941, illustrating the various uses to which the funds of the bands are put:—

	1940	1941
Salaries and wages	$ 61,558 65	$ 51,449 39
Enfranchisement and commutation	28,177 12	15,833 84
Farming operations, purchase of machinery, live stock, etc.	97,971 30	140,388 84
Relief	191,934 11	168,240 71
Repairs to roads	44,950 00	44,646 47
	$ 424,591 18	$ 420,559 25

Portion of revenues distributed in cash to Indians:—

	1940	1941
Interest	$ 396,536 47	$ 422,249 73
Rentals	49,957 35	44,646 47
Land	9,679 85	48,704 04
Timber	11,614 00	8,987 17
Total	$ 467,787 67	$ 524,587 41

It may be of interest to note that of the 5 per cent allowed on Indian trust funds, 3½ per cent was distributed to the Indians in cash and 1½ per cent in the form of assistance authorized by the Indian Act.

Assistance to Indians for the purchase of machinery, live stock, etc., to assist them in making their own living was increased during the year approximately 50 per cent and during the same period relief costs charged to band funds decreased almost 20 per cent.

Band Loans

A ready response met efforts to encourage the Indians to make greater use of their capital funds to promote the welfare and progress of band members, to enable individuals to improve their locations by erection and repair of buildings and fences, the sinking of wells, the purchase of live stock and farming equipment, and to enable them to more fully enjoy the productive value of their lands. A total of $24,795.47 was loaned from band funds to individual Indians. The advance of this sum necessitated the preparation of land and chattel mortgages to the number of 170, the average loan being $145.26. The sum advanced was for the purposes and in amounts as follows:

In the purchase of live stock and equipment		$ 12,679 00
Repairs to buildings, fences, etc.		5,360 45
In the construction of new buildings, and the sinking of wells		4,146 02
In the purchase of properties—farms, dwellings, etc.		$ 2,610 00
		$ 24,795 47

A marked improvement was noted in the collection of recoverable advances made to Indians from former years.

Personal Savings Accounts

In addition to the general funds of the bands, the division administers 1,122 individual savings accounts, representing a total of $247,261.66.

A statement of the year's deposits and withdrawals follows:

	1940	1941
Deposits	$ 75,306 16	$ 45,137 69
Withdrawals	72,476 34	38,393 49
Net inerease in funds on deposit	$ 2,829 82	$ 6,744 20

Annuities

The usual arrangement for payments of treaty annuities was made throughout the country, the total distributions being $259,919.75. The distribution of annuities commenced in April and was completed by the end of August. Seven of the treaty-paying parties were transported by aeroplane in districts where this mode of transportation saves time and expense.

SUMMARY OF INDIAN AFFAIRS BY PROVINCES AND TERRITORIES

PRINCE EDWARD ISLAND

Agency.—There is only one agency in the Province. A large number of Indians live on Lennox Island, and others live at Rocky Point, near Charlottetown, Morell, St. Andrews, and Scotch Fort.

Tribal Origin.—The Indians belong to the Micmac tribe, which is of Algonkian stock.

Occupations.—These Indians engage in farming on a small scale and some plant gardens. Most of them own a few head of cattle and horses. Their main occupations are basket-making, fishing, and working wherever they can find employment.

Dwellings.—They have fairly good homes and repairs were made to the houses during the year under review.

NOVA SCOTIA

Agencies.—There are nineteen Indian agencies in Nova Scotia; namely, Yarmouth, Digby, Shelburne, Lunenburg, Annapolis, Kings, Queens, Hants (Windsor), Hants (Shubenacadie), Halifax, Cumberland, Colchester, Pictou, Antigonish-Guysborough, Richmond, Inverness, Victoria, Cape Breton (Sydney), and Cape Breton (Eskasoni).

Tribal Origin.—The Indians are of Algonkian stock and bear the distinctive name of Micmac.

Occupations.—A certain amount of employment is available in lumber camps, sawmills, and as stevedores. Other Indians work for farmers, especially in the Annapolis Valley orchards. Seed, potatoes, and fertilizer are supplied but these Indians do not engage in large-scale farming. During the tourist season they act as canoemen and guides and they manufacture baskets, wooden handles, hockey sticks, butter tubs, churns, and barrels.

Dwellings.—The homes in most of the reserves consist of one and one-half story frame buildings, fairly well finished on the outside.

NEW BRUNSWICK

Agencies.—There are three agencies in New Brunswick: the Northeastern, at Richibucto; the Northern, at Perth; and the Southwestern, at Fredericton.

Tribal Origin.—Most of the Indians belong to the Micmac race, which is of Algonkian stock. There are also some bands of Maliseets, also of Algonkian stock.

Occupations.—The farming operations of the Indians are fairly well restricted to growing potatoes and garden vegetables; they also do some fishing. In certain parts of the province they are engaged commercially in the manufacture and sale of baskets, axe and pick handles, and small articles of furniture. The Indians are employed as day labourers and in lumber camps.

Dwellings.—Housing is similar to that in other parts of the Maritime Provinces.

QUEBEC

Agencies.—The Indian agency offices in Quebec are located as follows: Bersimis, Cacouna (Viger), Caughnawaga, Gagne (Maria), Gaspe, Gentilly (Becancour), Harrington Harbour (St. Augustine), Maniwaki, Mingan, Notre Dame du Nord (Timiskaming), Oka, Pierreville, Pointe Bleue, Restigouche, St. Regis, Senneterre (Abitibi), Seven Islands, Village des Hurons (Lorette).

Tribal Origin.—The principal tribes found in Quebec are: Iroquois at Caughnawaga, Lake of Two Mountains, and St. Regis; the Hurons of Lorette are also of Iroquoian stock; the Montagnais, who are of Algonkian stock, at Bersimis, Mingan, Lake St. John, Seven Islands; the Abenakis, of Algonkian stock, at Becancour and St. Francis; the Micmacs, of Algonkian stock, at Maria and Restigouche; and the Maliseets, of Algonkian stock, at Viger.

Occupations.—The Indians of the northern interior and the north side of the Gulf of St. Lawrence depend entirely on hunting, trapping and fishing for their subsistence. In the organized central and southern portions of the province they engage in mixed farming. A number of them raise fruit and dispose of it at nearby markets, and those who possess cows sell the milk to the creameries and cheese factories. In the Saguenay district they act as guides and canoemen and they find employment in lumber camps and mills. Indians also act as game guardians on established beaver preserves. The Indians of Caughnawaga are noted as steel workers and find highly remunerative employment in that trade. The native handicraft projects organized in this province are proving successful.

Dwellings.—In the older settled districts of the province many of the Indians own stone, brick, or frame houses of good construction. In the more remote districts the Indians live in tents during the greater part of the year.

ONTARIO

Agencies.—The Indian agency offices in Ontario are located as follows: Brantford (Six Nations), Chapleau, Chippawa Hill (Saugeen), Christian Island, Deseronto (Tyendinaga), Fort Frances, Golden Lake, Highgate (Moravian), Kenora, Longford Mills (Rama), Manitowaning (Manitoulin Island), Moose Factory (James Bay), Muncey (Caradoc), Parry Sound, Peterborough (Rice and Mud Lakes), Port Arthur, Sarnia, Sault Ste. Marie, Scugog, Sioux Lookout, Virginia (Georgina and Snake Islands), Sturgeon Falls, Wallaceburg (Walpole Island), Wiarton (Cape Croker).

Tribal Origin.—Most of the Indians of Ontario are Ojibwas, and are of Algonkian stock. The Oneidas of the Thames, the Mohawks of the Bay of Quinte, the Mohawks of Parry Sound district, and the Six Nations of Grand River, are of Iroquoian stock. There is a band of Pottawattamies at Walpole Island, and Delawares at the Caradoc (Muncey) Agency; these are of Algonkian stock.

Occupations.—The Indians in the southern, western, and central parts of Ontario engage largely in farming. The reserves generally are well suited for this purpose. Some of the Indians do well with dairy products. Others are proficient bushmen and in certain parts of the province Indians act as guides and canoemen and employment is available in various lumber camps. Snowshoes, canoes, and moccasins are manufactured. The women find sources of income by making baskets and fancy work, berry picking, and working as domestics. In the more remote parts of Ontario hunting, trapping, and fishing are the chief sources of livelihood. Although agriculture is not carried on to any extent among these Indians most of the bands grow crops of potatoes and vegetables.

Dwellings.—In the more settled districts many of the Indians own houses of brick, stone, or modern frame construction. On some reserves both houses and farm buildings are well built. The Indians of the northern part of the province are nomadic and consequently live in tents most of the year.

MANITOBA

Agencies.—The Indian agency offices in Manitoba are located as follows: Birtle, Griswold, Hodgson (Fisher River), Norway House, Portage la Prairie, Selkirk (Clandeboye), The Pas.

Tribal Origin.—Most of the Indians belong to the Ojibwa race, which is of Algonkian stock. Bands of Swampy Crees are found at the Norway House and Fisher River Agencies and in the York Factory district; these are also of Algonkian stock. The Indians located at the Griswold Agency are Sioux; there are also Sioux at the Birtle and Portage la Prairie Agencies. There is a band of Chipewyans at Churchill; this tribe is of Athapaskan stock.

Occupations.—The Indians living along the lakes and in the northern part of this province depend mainly on fishing, hunting, and trapping for their livelihood. The reserves most suitable for agriculture are chiefly within the Birtle, Griswold, Portage la Prairie, and Clandeboye Agencies. Indians from around Lake Manitoba and Lake Winnipeg work in the harvest fields in the farming communities. In the southern part of the province the Indians raise cattle and sell butter and other dairy products. Most of the reserves own good herds of well-bred stock, chiefly of the Shorthorn type. Any surplus of hay is put up for sale and on some reserves they own hay presses, shipping their surplus to market in winter. The Indians take out wood for sale during the winter and some work for large fish companies. The Indian women derive revenue from the sale of moccasins and gloves.

Dwellings.—On most of the reserves in Manitoba one finds fairly good log homes, one and one-half stories high with shingle roofs. They are usually white-washed every year which improves their appearance and makes for greater sanitation. There are also a number of houses of frame construction on all reserves. In the extreme north the habitations are more primitive.

SASKATCHEWAN

Agencies.—The Indian agency offices in Saskatchewan are located as follows: Balcarres (File Hills), Battleford, Broadview (Crooked Lakes), Duck Lake, Kamsack (Pelly), Leask (Carlton), Muscow (Qu'Appelle), Onion Lake, Punnichy (Touchwood).

Tribal Origin.—The most numerous tribes among the Saskatchewan Indians are the Ojibwas, Swampy Crees, and Plains Crees, which all belong to the Algonkian stock. In addition to these, Sioux Indians are found at the Crooked Lakes, Qu'Appelle, and Carlton Agencies, and on the Moose Woods Reserve. In the Onion Lake Agency there is a band of Chipewyans, who are of Athapaskan stock. There are also a few Chipewyan Indians in the Ile a la Crosse district.

Occupations.—The principal occupations of the Indians of Saskatchewan are farming and stock-raising. They own cattle of a very good type, mostly of Shorthorn breed. They are well equipped with implements and horses. In the extreme north the Indians still make their living from hunting, trapping, and fishing.

Dwellings.—On most of the reserves the Indians are fairly well housed, the homes being usually of log construction with shingle roof; others are of frame construction. In the north when the Indian is out on his hunting grounds his home consists of a log cabin with sod roof in winter, and a tent in summer.

ALBERTA

Agencies.—The Indian agency offices in Alberta are located as follows: Brocket (Peigan), Calgary (Sarcee), Cardston (Blood), Driftpile (Lesser Slave Lake), Fort Chipewyan (Athabaska), Gleichen (Blackfoot), Hobbema, Morley (Stony), Saddle Lake, Winterburn (Edmonton).

Tribal Origin.—The Alberta Indians are of Algonkian stock, with the exception of the Sarcees near Calgary and the Beavers and Slaves in the Lesser Slave Lake Agency, who are Athapaskan; the Paul's band in the Edmonton Agency, who are Iroquoian, and the Stonies, who are of Siouan stock. The Algonkian Indians of Alberta are subdivided into Blackfoot Nation, comprising the Indians of the Blackfoot, Blood, and Peigan Agencies; and Plains Crees found in the Lesser Slave Lake, Saddle Lake, Edmonton, and Hobbema Agencies.

Occupations.—The farming Indians of this province are well equipped with machinery and horses to carry on their work and in the south they own large herds of horses. The cattle herds are of good type, principally Shorthorn and Hereford. They bring high prices on the market and the Indians receive good returns from the sale of beef cattle. In the northern part of the province the Indians make their living from hunting and trapping. Fishing, working for white farmers and stockmen, and the sale of wood are all sources of income. The Blackfoot Indians operate two of their own coal mines and obtain good returns from the product.

Dwellings.—Most of the Indians of this province own good homes. On the Blackfoot Reserve every family has a house and barns of good construction. Frame houses and barns are also found on the Sarcee and Edmonton Reserves. Other houses are of log construction with shingle roofs.

BRITISH COLUMBIA

Agencies.—The Indian agency offices in British Columbia are located as follows: Alert Bay (Kwawkewlth), Bella Coola, Cranbrook (Kootenay), Duncan (Cowichan), Fort St. John, Hazelton (Babine), Kamloops, Lytton, Massett (Queen Charlotte Islands), Merritt (Nicola), New Westminster, Port Alberni (West Coast), Prince Rupert (Skeena), Telegraph Creek (Stikine), Vancouver, Vanderhoof (Stuart Lake), Vernon (Okanagan), Williams Lake.

Tribal Origin.—The Indians of the Bella Coola, Cowichan, Kamloops, Lytton, New Westminster, Nicola, Vancouver, and Okanagan Agencies belong to the Salish tribes. The Kootenay tribe is located in the agency of the same name. The Kwakiutl-Nootka tribe is located at the Kwawkewlth and West Coast Agencies; the Haidas, in the Queen Charlotte Islands; the Tlingits, in the Stikine; and the Tsimshians in the Skeena Agency. The Indians of the Babine, Stuart Lake, and Williams Lake Agencies belong to the Athapaskan race. The Indians of the Peace River Block are Athapaskan, with the exception of a small group of Saulteaux and Crees at Moberly Lake who are Algonkian.

Occupations.—Salmon fishing is one of the main sources of revenue of the Indians on the coast. They are also encouraged to fish for halibut. Many own power-boats and up-to-date equipment and either fish independently or by contract with the canneries. The canning of herring has recently opened up a new avenue of employment for Indian women. Trapping on registered trap-lines is also a means of livelihood. In the central and southern agencies the Indians are becoming less dependent on their trap-lines and are turning their attention increasingly to agriculture and other pursuits for a living. These Indians engage in cattle- and horse-raising. Fruit-growing is another source of income, some of the Indians owning orchards. There is a seasonal migratory labour movement to pick fruit, hops, etc. The Indians often move in family groups and even enter the United States in their wayfaring.

Dwellings.—The Indians of the west coast of Vancouver Island have roomy, well-ventilated, and well-kept houses. The high standard of comfort and decoration exhibited is quite remarkable, kitchens and bathrooms being equipped with most modern conveniences. The best Indian houses are found on the northwest coast among the Haidas of Queen Charlotte Islands, the Tsimshians of Port Simpson, Metlakatla, and Port Essington, and Kwakuitls of Bella Bella. In years past it was customary to build community houses in which as many as ten families lived. Now the young people are building their own homes and separating from the older people. New houses are continually being erected and improvements and repairs made to those already built. Dairy barns have been improved to meet the provincial dairy inspection regulations, and there is a gradual improvement in all farm buildings and outbuildings.

NORTHWEST TERRITORIES

Agencies.—The Indian Affairs Branch has three agencies in the Northwest Territories, namely: Fort Simpson, Fort Resolution, and Fort Norman.

Tribal Origin.—The principal tribes found in the far north are the Slaves, Hares, Loucheux, Sekani, Dogribs, Yellow Knives, Chipewyans, and Caribou Eaters. All these tribes are of Athapaskan stock. The most northerly tribes are the Takudah, whose territory extends to the Mackenzie Delta; and the Copper Mines, who are located along the Coppermine River. The territory occupied by these two last named tribes in contiguous to that inhabited by the Eskimos.

Occupations.—The Indians depend almost entirely upon hunting and trapping for a livelihood. Here and there some cultivate potatoes and garden vegetables. They own no cattle or horses. They catch and preserve large quantities of fish for their own use and for food for their dogs during winter. They also pick and dry wild berries for winter use.

Dwellings.—These Indians live in log cabins in winter and in tents and teepees during the summer.

YUKON TERRITORY

Tribal Origin.—The Forty-Mile, Blackstone, and Moosehide bands belong to the Takudah tribe. There is a band of Slaves at Lancing Creek who migrated from Good Hope on Mackenzie River; another band of Slaves, called Nahani, is located at the head-waters of Pelly River. All these Indians are of Athapaskan stock. At Mayo, Selkirk, Little Salmon, and Carmacks there are bands belonging to the tribe known as Stick Indians. Bands belonging to the Tlingit tribe are found at Whitehorse, Teslin Lake, Champagne Landing, and Carcross.

Occupations.—Hunting, trapping, and fishing are the chief occupations of the Yukon Indians. The women derive some revenue from the sale of moccasins and curios of various kinds, and the men are expert at making toboggans and snowshoes. Little farming is carried on owing to climatic conditions but some of the Indians cultivate patches of potatoes and other vegetables for their own use.

Dwellings.—The Indians of the Yukon live in log cabins.

TABLE 1

Census of Indians: Arranged Under Provinces, 1939

Province	Number in Province	Religion							Under 7 years		From 7 to 16 inclusive		From 17 to 21 inclusive		From 22 to 65 inclusive		From 65 years upwards	
		Anglican	Baptist	United Church	Presbyterian	Roman Catholic	Other Christian Beliefs	Aboriginal Beliefs	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Alberta	12,163	1,709	.....	1,558	.....	8,745	.....	151	1,374	1,444	1,423	1,406	559	561	2,454	3,311	308	323
British Columbia	24,276	4,701	109	4,794	.....	13,954	690	28	2,192	2,290	2,929	2,922	1,112	1,116	5,301	4,701	868	845
Manitoba	14,561	4,792	50	4,195	643	4,638	.....	243	1,492	1,545	1,739	1,566	919	916	2,853	2,603	460	468
New Brunswick	1,922	.....	.....	.....	.....	1,922	.....	.....	231	214	243	212	84	103	401	353	43	38
Northwest Territories	3,724	640	.....	.....	.....	3,084	.....	.....	396	396	444	401	191	180	795	792	38	91
Nova Scotia	2,165	5	.....	.....	3	2,157	.....	.....	232	241	220	234	113	103	484	405	72	61
Ontario	30,145	9,747	1,179	5,533	220	9,862	887	2,717	2,395	2,573	2,957	3,012	2,001	1,964	6,811	6,654	839	939
Prince Edward Island	274	.....	.....	.....	.....	274	.....	.....	24	33	30	31	11	22	60	50	3	10
Quebec	14,578	2,830	.....	600	.....	11,071	17	60	1,410	1,435	1,649	1,580	783	784	3,250	2,883	391	413
Saskatchewan	13,020	4,266	.....	1,228	139	6,242	10	1,145	1,443	1,594	1,526	1,533	617	547	2,512	2,590	293	365
Yukon	1,550	1,352	.....	.....	.....	146	.....	52	162	179	175	168	81	70	305	272	68	70
Total Indian Population	118,378	30,032	1,338	17,908	1,005	62,095	1,604	4,396	11,351	11,944	13,335	13,065	6,471	6,366	25,226	23,614	3,383	3,623

TABLE 2

Crops Sown and Harvested, Land Broken and Summer-fallowed, Hay Put Up, Etc.

Province	Wheat		Oats		Other Grains		Roots and Tubers		Hay and Green Feed		Acres of Garden	New Breaking — Acres	Acres Summer Fallow	Total Acres under Cultivation
	Acres Sown	Bushels Harvested	Acres Sown	Bushels Harvested	Acres Sown	Bushels Harvested	Acres Sown	Bushels Harvested	Acres	Tons				
Alberta	23,657	327,231	8,956	258,965	1,649	43,970	199½	15,257	2,261	9,755	49	1,312	18,334	56,417½
British Columbia	3,666	73,981	3,643	72,318	731	16,009	2,305	178,397	21,673	35,470	1,273	507	1,247	35,045
Manitoba	6,715	108,916	2,093	31,482	980½	9,394	476	23,297	889	10,144	146½	1,288	2,683	15,271½
New Brunswick	.....	.....	97	810	10	95	85	11,434	186	124	24	8	.....	410
Northwest Territories	.....	.....	.....	.....	.....	.....	51	1,662	3	28	52	2	2	111
Nova Scotia	.....	.....	33	433	2	25	123	5,345	249	265	63	20	73	563
Ontario	3,142	40,886	21,336	455,076	6,837	137,849	2,561	84,810	7,106	19,933	1,921	1,207	3,492	47,602
Prince Edward Island	2	23	40	1,200	1	12	14	1,100	38	38	2	1	.....	98
Quebec	33	314	1,716	23,245	505	9,865	549	11,586	2,425	3,332	258	343	379	6,208
Saskatchewan	21,105	226,900	9,748	115,899	1,068	7,631	619	29,095	1,672	7,454	277	3,281	11,423	49.193
Yukon	.....	.....	.....	.....	.....	.....	2	222	½	1	.....	.....	.....	2½
	58,320	778,251	47,662	959,428	11,783½	224,850	6,984½	362,205	36,502½	86,544	4,065½	7,970	37,633	210,921½

TABLE 3

Land: Private and Public Buildings and Property

Province	Total Area of Reserve (Acres)	Acres under Wood	Acres Cleared but not Cultivated	Acres under actual Cultivation	Acres fenced in in Reserves	Private Property								Public Property					
						Stone, Brick and Frame Dwellings	Other Dwellings	Outbuildings, etc.	Ploughs, Harrows, Drills, etc.	Mowers, Reapers Binders, Threshers, etc.	Carts, Wagons and Vehicles	Automobiles	Tools and small Implements	Churches	Council Houses	School Houses	Saw Mills	Other Buildings	Engines and Machinery
Alberta	1,348,527	359,882	918,974	56,417¼	489,207¼	423	1,929	5,553	2,450	1,538	2,536	96	9,413	11	10	7	1	147	272
British Columbia	780,854	441,236	271,887	35,045	298,505	4,612	2,929	4,174	2,679	959	2,297	514	39,181	157	69	58	7	65	164
Manitoba	529,432	304,753	125,071	15,271½	51,101	143	2,895	1,870	880	719	1,319	82	8,186	61	15	42	3	112	49
New Brunswick	37,394	32,852	1,052	410	1,152	372	36	223	65	18	66	21	1,105	7	5	11	.....	5	1
Northwest Territories	1,924	.....	47	111	57	.....	305	179	.....	.....	.....	.....	472	.....	1	.....	.....	.....	.....
Nova Scotia	18,187	12,052	1,565	563	1,706	377	143	102	71	18	89	19	898	11	3	11	1	8	3
Ontario	1,326,503	1,125,140	90,298	47,602	102,917	2,822	2,407	5,285	3,842	1,181	3,399	594	48,967	106	44	92	11	111	126
Prince Edward Island	1,508	1,457	23	98	188	38	.....	22	15	9	8	.....	35	1	1	1	.....	1	2
Quebec	175,049	122,496	14,423	6,208	14,868	1,407	391	2,291	616	276	1,317	131	5,294	24	5	30	.....	27	36
Saskatchewan	1,200,806	516,843	736,307	49,193	340,008	279	2,348	3,116	2,453	1,755	2,887	37	15,588	46	23	27	2	72	69
Yukon	3,550	152	5	2½	6	1	.....	3	3	1	5	2	3	1	.....	.....	.....	1	4
	5,423,734	2,916,863	2,159,652	210,921½	1,299,715½	10,474	13,383	22,818	13,074	6,474	13,923	1,496	129,142	425	176	279	25	549	726

TABLE 4

Live Stock and Poultry: General Effects

Province	Horses			Cattle				Other Stock	Poultry	General Effects					
	Stallions	Geldings and Mares	Foals	Bulls	Steers and Work Oxen	Milch Cows	Young Stock	Pigs, Sheep, etc.		Motor and Sail Boats	Row Boats and Canoes	Rifles and Shot Guns	Steel Traps	Nets	Tents
Alberta	173	9,572	912	168	1,802	5,456	3,953	950	4,859	205	645	2,542	21,143	1,043	2,254
British Columbia	182	7,824	1,393	274	4,640	2,939	4,896	2,970	31,603	1,897	3,127	8,572	84,521	2,042	1,980
Manitoba	15	1,719	33	48	578	1,669	1,035	388	5,500	91	1,719	3,496	57,145	5,805	1,836
New Brunswick	.....	7	.....	1	.....	29	22	29	615	39	162	197	1,195	180	50
Northwest Territories	.....	34	4	.....	.....	.....	.....	1,595	.....	160	585	1,278	20,340	540	502
Nova Scotia	.....	39	4	5	13	126	62	65	531	9	30	250	1,282	83	18
Ontario	26	2,026	173	106	324	2,387	1,316	4,256	33,108	498	3,858	5,972	137,059	5,792	3,115
Prince Edward Island	.....	8	.....	.....	.....	11	14	4	130	5	10	10	100	10	.....
Quebec	5	530	62	105	2	1,602	790	698	6,500	239	1,277	2,427	23,090	685	1,037
Saskatchewan	14	4,093	82	72	864	2,590	1,716	1,041	8,102	38	462	2,266	29,876	1,067	1,758
Yukon	.....	4	.....	1	.....	4	4	3	40	1	.....	.....	.....	.....	2
	415	25,856	2,663	780	8,223	16,813	13,808	11,999	90,988	3,182	11,875	27,010	375,751	17,247	12,552

TABLE 5

Sources and Value of Income

Province	Value of Farm Products including Hay	Value of Beef Sold also of that used for Food	Wages Earned	Received from Land Rentals	Received from Timber	Received from Mining, Royalties, including Sand, Gravel and Stone	Earned by Fishing	Earned by Hunting and Trapping	Earned by other Industries and Occupations	Annuities Paid and Interest on Indian Trust Funds	Total Income of Indians
	$	$	$	$ cts.	$ cts.	$ cts.	$	$	$	$ cts.	$ cts.
Alberta	278,758	108,046	58,497	31,143 07	723 48	1,385 75	6,185	96,136	60,838	235,236 55	876,948 85
British Columbia	487,275	105,310	772,150	55,483 55	37,400 67	1,854 79	524,900	229,986	206,745	53,341 48	2,474,446 49
Manitoba	125,551	22,220	87,000	2,118 36	1,381 66	.....	46,800	143,500	36,015	101,633 73	566,219 75
New Brunswick	5,030	6,885	13,750	325 00	.....	90 15	1,003	1,385	8,762	2,614 11	39,844 26
Northwest Territories	7,303	.....	7,585	.....	.....	.....	14,340	248,260	4,810	19,190 00	301,488 00
Nova Scotia	14,821	1,025	21,035	15 00	909 76	.....	1,015	2,420	13,880	1,976 52	57,097 28
Ontario	352,649	108,744	442,070	34,042 37	33,274 21	1,291 22	187,250	465,032	241,930	392,268 23	2,258,551 03
Prince Edward Island	1,000	280	1,650	.....	.....	.....	475	150	1,200	0 14	4,755 14
Quebec	98,648	12,880	206,220	9,643 00	1,867 09	548 56	2,450	208,150	52,550	24,052 44	617,009 09
Saskatchewan	252,440	56,499	60,956	13,194 02	73 18	.....	21,750	53,127	39,995	154,717 19	652,751 39
Yukon	3,059	.....	.....	.....	.....	.....	.....	.....	.....	18 03	3,077 03
	1,626,534	421,889	1,670,913	145,964 37	75,630 05	5,170 47	806,168	1,448,146	660,725	985,048 42	7,852,188 31

Statement of Ordinary Expenditure for Year 1940-41

—	Administration	Indian Agencies	Reserves and Trusts	Medical	Grants to Hospitals	Welfare	Education	Grants to Residential Schools	Grants to Exhibitions	Total
	$	$	$	$	$	$	$	$	$	$
Nova Scotia	8	7,259	.....	29,706	.....	70,851	10,009	28,565	.....	146,398
Prince Edward Island	.....	1,971	.....	4,929	.....	6,536	793	.....	.....	14,229
New Brunswick	.....	7,789	.....	17,121	.....	48,507	13,356	.....	.....	86,773
Quebec	.....	39,904	2,540	95,307	.....	200,636	50,890	13,434	.....	402,711
Ontario	237	104,385	7	163,638	.....	126,471	130,601	250,958	2,263	778,560
Manitoba	515	69,910	2,711	92,926	.....	93,518	68,679	166,620	275	495,154
Saskatchewan	1,634	117,884	2,856	71,496	.....	94,647	43,096	264,092	800	596,505
Alberta	115	106,301	9	76,911	1,080	68,546	9,080	312,911	975	575,928
British Columbia	1,525	125,951	1,458	192,429	.....	104,007	89,480	301,230	1,038	817,118
Northwest Territories	.....	18,833	.....	31,909	3,240	21,938	2,050	39,822	.....	117,792
Yukon	.....	887	.....	8,867	.....	12,914	5,435	16,038	.....	44,141
Headquarters and Miscellaneous	50,616	15,057	30,064	19,040	.....	34,357	71,944	.....	277	221,355
Hospitals and Nursing Stations	.....	.....	.....	198,733	.....	.....	.....	.....	.....	198,733
Tuberculosis Control	.....	.....	.....	308,968	.....	.....	.....	.....	.....	308,968
B.C. Special	.....	2,132	.....	34,996	.....	20,563	9,961	.....	.....	67,652
B.C. Special, Surveys and Engineering Branch	.....	17,536	.....	.....	.....	.....	.....	.....	.....	17,536
Surveys and Engineering Branch	.....	7,133	6,158	11,480	.....	.....	9,231	.....	.....	34,002
Pensions and Gratuities	.....	2,758	.....	417	.....	.....	.....	.....	.....	3,175
Total	54,650	645,690	45,803	1,358,873	4,320	903,491	514,605	1,393,670	5,628	4,926,730
Indian Annuities	.....	.....	.....	.....	.....	.....	.....	.....	.....	259,920
										5,186,650

Open Account—Indian Act Revolving Fund 1940-41

Expenditure

Quebec	$ 7,376 55	
Manitoba	360 10	
Saskatchewan	2,936 72	
		$10,673 37

Repayments and Refunds

Quebec	$ 7,169 70	
Manitoba	242 09	
Saskatchewan	4,356 34	
Alberta	635 68	
		12,403 81
Repayments over expenditure		$ 1,730 44

Net Expenditure by Provinces 1940-41

Fur Conservation

Quebec	$ 4,608 47
Manitoba	17,067 33
Saskatchewan	33,620 47
Alberta	3,255 99
British Columbia	910 00
Northwest Territories	14,261 71
Head Office (Miscellaneous)	5,686 54
	$ 79,410 51

Annuities Paid and Interest on Indian Trust Funds 1940-41

Alberta

Athabaska	$ 8,025 00
Blackfoot	124,648 41
Blood	9,450 18
Edmonton	23,585 23
Fort St. John	1,823 29
Hobbema	17,801 07
Lesser Slave Lake	26,404 13
Peigan	6,324 45
Saddle Lake	8,116 37
Sarcee	2,871 86
Stony	6,186 56
	$235,236 55

Northwest Territories

Fort Norman	$ 6,590 00
Fort Resolution	7,215 00
Fort Simpson	5,385 00
	$ 19,190 00

British Columbia

Babine	$ 728 48
Bella Coola	406 14
Cowichan	6,430 65
Kamloops	1,104 26
Kootenay	833 80
Kwawkewlth	4,184 11
Lytton	4,181 42
New Westminster	17,588 96
Nicola	58 18
Okanagan	1,106 71
Queen Charlotte	190 91
Skeena River	2,841 85

BRITISH COLUMBIA—*Concluded*

Stikine	1 01
Stuart Lake	1,463 70
Vancouver	10,017 68
West Coast	2,007 58
Williams Lake	196 04
	$ 53,341 48

MANITOBA

Birtle	$ 4,731 70
Clandeboye	16,070 00
Fisher River	12,188 01
Fort Churchill and York Factory	3,545 00
Portage la Prairie	20,690 86
Griswold	478 45
Norway House	17,803 25
The Pas	26,126 46
	$101,633 73

NEW BRUNSWICK

N. B. Northern	$ 1,030 62
N. B. Northeastern	1,505 66
N. B. Southwestern	77 83
	$ 2,614 11

NOVA SCOTIA

Nova Scotia	$ 1,976 52

PRINCE EDWARD ISLAND

Prince Edward Island	$ 14

ONTARIO

Cape Croker	$ 21,528 85
Caradoc	3,243 71
Chapleau	2,872 52
Christian Island	15,147 00
Fort Frances	16,021 82
Georgina Island	3,649 07
Golden Lake	17 57
James Bay	8,380 00
Kenora	24,551 49
Manitoulin Island	29,702 64
Moravian	5,911 81
Parry Sound	17,393 15
Port Arthur	16,141 75
Rama	8,018 79
Rice Lake	17,030 71
Sarnia	16,563 58
Saugeen	16,203 05
Sault Ste. Marie	18,319 70
Scugog	1,054 84
Six Nations	47,471 15
Sturgeon Falls	69,584 34
Sioux Lookout	24,197 40
Tyendinaga	5,911 81
Walpole Island	3,351 48
	$392,268 23

QUEBEC

Becancour	$ 374 80
Bersimis	7,085 59
Cacouna	483 49
Caughnawaga	976 30
Lorette	801 41
Maniwaki	4,076 86
Manowan	2,077 53
Maria	.....
Mingan	.....
Oka	525 90

QUEBEC—*Concluded*	
Pierreville	354 38
Pointe Bleue	375 79
Restigouche	271 19
St. Regis	3,099 08
Timiskaming	3,534 36
Seven Islands	15 76
	$ 24,052 44
SASKATCHEWAN	
Battleford	$ 20,387 17
Carlton	23,860 74
Crooked Lakes	29,112 04
Duck Lake	10,542 86
File Hills	4,504 08
Onion Lake	7,585 32
Pelly	12,858 10
Qu'Appelle	26,623 56
Touchwood	19,239 58
Wood Mountain	3 74
	$154,717 19
YUKON	
Yukon Indians	$ 18 03

Indian Trust Fund

Showing transactions in connection with the fund during the fiscal year ended March 31, 1941.

——	Debit	Credit
	$ cts.	$ cts.
Balance, March 31, 1940		14,297,756 59
Collections on land sales, timber and stone dues, rents, fines, fees, etc.		583,658 97
Interest for the year ended March 31, 1941		725,717 65
Credit transfers during the year		6,177 03
Expenditure during the year	1,182,575 43	
Transfers by Warrant, etc.	14,904 17	
Balance, March 31, 1941	14,415,830 64	
	15,613,310 24	15,613,310 24

School Statement

Statement Showing the Enrolment by Provinces in the Different Classes of Schools for the Fiscal Year Ended March 31, 1941

RESIDENTIAL SCHOOLS

Province	Number of Schools	Denomination				Number on Roll			Average Attendance	Percentage of Attendance	Grades								
		Church of England	Presbyterian	Roman Catholic	United Church	Boys	Girls	Total			I	II	III	IV	V	VI	VII	VIII	IX
Nova Scotia	1	.....	.....	1	.....	82	82	164	158	96·34	47	12	36	21	22	9	9	8	.....
Quebec	2	1	.....	1	.....	34	42	76	65	85·52	19	38	17	.....	2	.....	.....	.....	.....
Ontario	13	5	1	6	1	824	873	1,697	1,582	93·22	463	298	250	180	157	130	94	90	35
Manitoba	9	1	1	4	3	508	561	1,069	1,018	95·22	397	141	142	167	99	63	30	13	17
Saskatchewan	14	3	.....	9	2	813	910	1,723	1,639	95·12	558	268	265	207	204	125	68	27	1
Alberta	19	5	.....	12	2	973	1,028	2,001	1,860	92·95	683	298	259	240	262	137	71	40	11
Northwest Territories	4	1	.....	3	.....	82	133	215	185	86·04	145	20	22	13	9	6	.....	.....	.....
British Columbia	13	2	.....	9	2	810	940	1,750	1,665	95·14	595	311	236	199	193	128	48	34	6
Yukon	2	2	.....	.....	.....	39	40	79	71	89·87	16	15	14	8	13	7	4	1	1
Total—Residential Schools	77	20	2	45	10	4,165	4,609	8,774	8,243	93·95	2,923	1,401	1,241	1,035	961	605	324	213	71

DAY SCHOOLS

Province	Number of Schools	Number on Roll			Average Attendance	Percentage of Attendance	Grades								
		Boys	Girls	Total			I	II	III	IV	V	VI	VII	VIII	IX
Prince Edward Island	1	8	8	16	12	75·00	5	3	2	1	3	.....	2	.....	.....
Nova Scotia	11	131	143	274	184	67·15	116	57	28	22	18	15	13	4	1
New Brunswick	11	160	159	319	248	77·74	104	56	37	33	39	28	11	10	1
Quebec	29	719	711	1,430	1,111	77·69	489	315	193	154	126	71	28	38	16
Ontario	87	1,265	1,344	2,609	1,923	73·70	850	459	338	272	218	184	146	123	19
Manitoba	44	554	506	1,060	611	57·64	564	174	150	84	42	34	9	3	.....
Saskatchewan	28	313	331	644	434	67·39	315	93	111	55	35	26	9	.....	.....
Alberta	1	17	11	28	17	60·71	9	2	4	5	5	2	1	.....	.....
Northwest Territories	4	20	26	46	29	63·04	27	7	4	4	3	1	.....	.....	.....
British Columbia	63	953	1,006	1,959	1,350	68·91	944	321	263	182	114	88	35	12	.....
Yukon	3	18	24	42	30	71·42	16	9	3	4	.....	.....	5	5	.....
Total—Day Schools	282	4,158	4,269	8,427	5,949	70·59	3,439	1,496	1,133	816	603	449	259	195	37

COMBINED WHITE AND INDIAN SCHOOLS

Province	Number of Schools	Number on Roll			Average Attendance	Percentage of Attendance	Grades								
		Boys	Girls	Total			I	II	III	IV	V	VI	VII	VIII	IX
Quebec	1	7	6	13	10	76·92	4	2	6	1	.....	.....	.....	.....	.....
Ontario	5	90	81	171	127	74·27	65	24	25	19	10	10	8	8	2
Manitoba	3	17	12	29	16	55·17	19	4	3	1	.....	.....	1	.....	1
Saskatchewan	1	2	4	6	4	66·66	1	1	2	2	.....	.....	.....	.....	.....
British Columbia	1	1	4	5	4	80·00	4	.....	.....	1	.....	.....	.....	.....	.....
Total—Combined White and Indian Day Schools....	11	117	107	224	161	71·87	93	31	36	24	10	10	9	8	3

SUMMARY OF SCHOOL STATEMENT

Province	Classes of Schools			Total Number of Schools	Number on Roll			Average Attendance	Percentage of Attendance	Grades								
	Day	Residential	Combined		Boys	Girls	Total			I	II	III	IV	V	VI	VII	VIII	IX
Prince Edward Island	1	.....	.....	1	8	8	16	12	75·00	5	3	2	1	3	.....	2	.....	.....
Nova Scotia	11	1	.....	12	213	225	438	342	78·08	163	69	64	43	40	24	22	12	1
New Brunswick	11	.....	.....	11	160	159	319	248	77·74	104	56	37	33	39	28	11	10	1
Quebec	29	2	1	32	760	759	1,519	1,186	78·07	512	355	216	155	128	71	28	38	16
Ontario	87	13	5	105	2,179	2,298	4,477	3,632	81·12	1,378	781	613	471	385	324	248	221	56
Manitoba	44	9	3	56	1,079	1,079	2,158	1,645	76·22	980	319	295	252	141	97	40	16	18
Saskatchewan	28	14	1	43	1,128	1,245	2,373	2,077	87·52	874	362	378	264	239	151	77	27	1
Alberta	1	19	.....	20	990	1,039	2,029	1,877	92·50	692	300	263	245	267	139	72	40	11
Northwest Territories	4	4	.....	8	102	159	261	214	81·99	172	27	26	17	12	7	.....	.....	.....
British Columbia	63	13	1	77	1,764	1,950	3,714	3,019	81·28	1,543	632	499	382	307	216	83	46	6
Yukon	3	2	.....	5	57	64	121	101	83·47	32	24	17	12	13	7	9	6	1
Totals	282	77	11	370	8,440	8,985	17,425	14,353	82·37	6,455	2,928	2,410	1,875	1,574	1,064	592	416	111

IMMIGRATION BRANCH

F. C. BLAIR, DIRECTOR

The Immigration Branch is responsible for the administration of the Immigration Act and Regulations, the Chinese Immigration Act and Regulations, and all matters related to the encouragement of immigration; the inspection overseas, at ocean ports and International Boundary ports, of immigrants, tourists and other travellers, seeking entry to or transit through Canada; the inquiry into settlement arrangements for immigrants and non-immigrants; the exclusion of the prohibited and undesirable classes; the investigation of complaints, the holding of Boards of Inquiry and preparation of appeals, and the deportation of undesirables. The Branch also deals with the repatriation of distressed Canadians and all general matters relating to colonization in Canada. During the war the Branch is charged with the enforcement of certain war regulations particularly relating to enemy aliens and seamen and has been called upon to serve on numerous Inter-Departmental Committees.

The number of immigrants admitted to Canada in 1940-41 totalled 11,496, a decrease of 29 per cent as compared with the previous year, and with the exception of 1936 was the lowest since any attempt was made to collect immigration statistics. There was also a regrettable reduction in non-immigrant arrivals most of whom come from the United States. The non-immigrant movement in recent years was as follows:—

	Via Ocean Ports	From U.S.A.	Totals
Fiscal year ended March 31, 1934	36,739	20,861,486	20,898,225
" " " " " 1935	39,224	22,733,957	22,773,181
" " " " " 1936	40,401	25,039,758	25,080,159
" " " " " 1937	47,008	28,888,106	28,935,114
" " " " " 1938	47,832	31,179,807	31,227,639
" " " " " 1939	53,822	29,099,356	29,153,178
" " " " " 1940	42,126	28,295,332	28,337,458
" " " " " 1941	34,035	18,381,660	18,415,695

There was a corresponding reduction in the number of Canadian non-immigrants returning to the Dominion after visits abroad, the figures for three years being as follows:—

—	Via Ocean Ports	From U.S.A.	Totals
Fiscal year ended March 31, 1939.....	30,446	12,098,397	12,128,843
" " 1940.....	18,757	11,590,952	11,609,709
" " 1941.....	10,687	5,224,356	5,235,043

The figures quoted have no relation to the table of " Returning Canadians " which appears in a subsequent paragraph.

The administrative work of the Branch has continued throughout the year to call for the closest attention. There was a great deal of extra work involved in the arrival during the summer of 1940 of some 6,000 British children and more than 1,500 British mothers to be guests of Canada for the duration of the war. Thousands of records relating to the arrivals of persons in Canada in recent years have been made available to other branches of the public service, particularly to the Custodian of Enemy Property, the Foreign Exchange Control Board, and the Royal Canadian Mounted Police.

The daily incoming mail averaged 1,100 pieces and the outgoing mail, 600. If a record had been kept of long distance telephone communications received and sent, this record would be materially increased.

Statistics

The statistical data submitted are similar to that of last year, but reduced from preceding years. In the preparation of the tables, an effort has been made to supply the sort of statistical information that is most likely to be useful and most frequently requested.

Returning Canadians

A movement known as "Returning Canadians", which is not included in the immigration statistics, is set out in the following table. It shows persons returning to Canada after residence abroad and these were re-admitted to Canada as Canadian citizens. The table divides the movement into three classes of Canadian citizens described in the Immigration Act.

Returning Canadians

—	Canadian Born	British Born Outside Canada	Canadians Naturalized	Totals
Fiscal year, 1924–25	36,473	4,487	2,815	43,775
Fiscal year, 1925–26	40,246	4,102	2,873	47,221
Fiscal year, 1926–27	49,255	5,326	2,376	56,957
Fiscal year, 1927–28	35,137	3,280	1,470	39,887
Fiscal year, 1928–29	30,008	2,795	995	33,798
Fiscal year, 1929–30	26,959	2,030	841	29,830
Fiscal year, 1930–31	26,811	2,111	1,287	30,209
Fiscal year, 1931–32	17,691	1,069	651	19,411
Fiscal year, 1932–33	16,320	757	548	17,625
Fiscal year, 1933–34	8,366	397	409	9,172
Fiscal year, 1934–35	5,811	937	870	7,618
Fiscal year, 1935–36	4,854	418	542	5,814
Fiscal year, 1936–37	4,522	319	223	5,064
Fiscal year, 1937–38	4,524	356	329	5,209
Fiscal year, 1938–39	3,825	360	386	4,571
Fiscal year, 1939–40	3,687	505	369	4,561
Fiscal year, 1940–41	4,910	177	53	5,140

Inspectional Work in Canada

The organization of the Branch in Canada consists of a head office and four district offices, each district office being in charge of a superintendent. These are known as the Atlantic District which covers all territory east of the Ontario-Quebec boundary; the Eastern District which includes all the Province of Ontario, east of Schreiber; the Western District which extends from Schreiber, Ont., to Kingsgate, B.C.; and the Pacific District which includes all territory west of Kingsgate. There were at the end of the year, 40 seaports, 197 International Boundary ports, and 4 United States ports, where examination was conducted and 5 inland agencies, making a total of 246. The administrative staff totals 86. In the outside service there are 625 full-time and 280 part-time officers. Since 1930 the head office staff has dropped from 155 to 86 and the total immigration staff from 1,179 to 991, including those employed part-time. It is the practice at all small ports to have Customs Officers act as Immigration Inspectors. On August 9, 1940, the Branch suffered a great loss through the untimely death of Mr. J. Saxon Fraser, Superintendent of the Eastern District, who joined the Immigration staff in January, 1906.

The increase of travel facilities by automobile and motor bus has resulted in the opening of new international highways and increased the problems of inspectional work. Travel by air has also necessitated increased examining stations. At St. Hubert Airport at Montreal 15,627 passengers were examined in the current year as compared with 11,952 the previous year and this is but an example of increases in other parts of Canada. In the Atlantic District the war caused an enormous increase in the work of looking after seamen. During

the year 1,426 deserters were reported. Most of these were later apprehended and dealt with by Boards of Inquiry, the number of Boards having increased from 478 in 1940 to 1,125 in 1941. All ships entering from foreign ports are required to file crew lists and in war time much greater care is necessary to see that crews of incoming ships are carefully examined. The volume of work in the Atlantic District in this direction alone may be visualized from the fact that 11,556 ship entries were handled during the year. The situation on the Pacific Coast both with regard to desertions and ship entries while serious, was not as difficult as that on the Atlantic Coast.

Inspectional Work Overseas

Since Confederation Canada's immigration interests in the British Isles were taken care of from London, first through the office of the Canadian High Commissioner and later through an Immigration Commissioner appointed towards the close of the last century. Later, agencies were opened at Liverpool, Birmingham, Bristol, Cardiff, Bangor, Exeter, Peterborough, and Southampton in England; Glasgow, Aberdeen, and Inverness in Scotland; and Belfast and Dublin in Ireland. Most of these were closed during the period 1930-35.

At the beginning of the current fiscal year there were Canadian Immigration offices at Liverpool, Glasgow, and Belfast and a central office in London and on the Continent at Paris, Antwerp, Rotterdam, Hamburg, and Gdynia and in the Far East at Hong Kong. The outbreak of war closed the offices at Hamburg and Gdynia and later its spread necessitated the abandonment of the offices at Paris, Antwerp, and Rotterdam. During the year the offices at Liverpool, Glasgow, and Belfast were closed and all work in the British Isles was centred in London. In July, 1940, an inspectional office was opened in Lisbon, Portugal, which is still in operation.

During the spring and early summer many inquiries reached the London and district offices from persons who were desirous of moving to Canada or at least of sending their children to Canada for the duration of the war. Every possible encouragement was given to those who were able to leave Britain and had relatives or friends whom they might join in Canada. All persons male and female between the ages of 16 and 60 were required to secure exit permits from the authorities in the United Kingdom. The number moved was determined largely by the shipping facilities available. A party of 32 children sailed in April for training at the Fairbridge Farm School near Duncan, B.C. A second party organized for a later sailing had to be cancelled on account of war conditions. The advent of war put an end to the immigration of men and women between 16 and 60 able to help in the war effort of the Mother Country. This is shown in the nature of inquiries received in the London and district offices. Most of the correspondence in the current year had to do with the movement of children, of distressed Canadians, and of refugees.

Refugees

Within the past 5 years most of the immigrants received from Continental Europe were of the refugee class. Prior to the war of 1914-18, European emigration to Canada was largely the result of publicity efforts of transportation companies and the Dominion Government, and at times by societies or organizations. At that time the term " refugee " was seldom heard. The Great War which made such sweeping changes in the boundaries of European states, changed the citizenship of between thirty and forty millions. It also created new nationalities, but left large numbers without any recognized citizenship and these later became known as refugees. The League of Nations devoted a great deal of attention and effort to the care, migration, and settlement of thousands of these homeless and stateless people and through a Commissioner for Refugees and the co-operation of several immigration countries, was successful in transplanting a large number of refugees to new homes.

The Canadian Expeditionary Force and their dependants had scarcely returned to Canada when the advance movement of refugees from Europe began. In their eagerness to leave Europe, all sorts crowded the ships for Canada. The ravages of war had left its mark on many and it soon became apparent that medical and civil inspection must be moved from Canadian ports of arrival to sailing ports in Europe if protection for the immigrant and for Canada was to be made possible. Conditions at Canadian Atlantic ports became so serious that on one occasion 2,000 persons were held in detention at Atlantic ports, unable to qualify for admission because of their mental, physical, moral, or financial condition.

In the autumn of 1920 Canada made the first attempt to establish an inspectional service at European ports and within a short time had established a system of pre-migration examination which continued until the outbreak of the present war and to a limited extent still continues. It is worthy of note that the governments of states in which Canadian inspectional offices were located viewed Canada's effort sympathetically and in many cases gave valuable support. It was generally recognized that the determination of fitness, brought near to the home of the intending migrant, removed the uncertainty of a long and expensive journey to the new world with the danger of being turned back at its doors.

The plan was both simple and effective. Canada stationed trained immigration and medical officers on the highways of travel and required migrants to secure an immigration vise before sailing. The vise was given without charge. The effect of overseas inspection was noticeable immediately at Canadian ports where detention and hospital buildings that once were overflowing were now almost empty.

In the autumn of 1923 approval was given to the first considerable organized group of European refugees,—a group both homeless and stateless. The number finally admitted was much larger than 5,000.

The term "refugee" in recent years has acquired a much wider application than when it became a familiar word after the Great War. Then, it was applied mainly to those who had lost both homes and citizenship; latterly, it has been applied to all who because of political, religious, racial, or economic troubles actual or threatened, have been forced or induced to move.

Reference has been made in previous Annual Reports to the problem of moving and settling men without money. For many years the exodus of settlers was discouraged by emigration countries. Latterly, encouragement has been given in many countries to the exodus of unwanted minorities, but there has been an increasing effort to retain their capital while encouraging the exit of these people.

In the immigration statistical tables, the term "refugee" is not used and there is no way by which exact figures may be supplied. Canada, in accordance with a generally accepted practice, places greater emphasis upon race than upon citizenship. Widespread changes in the latter within a generation would have made a comparison between pre-war and post-war immigration quite impossible. While immigrants are not shown in the statistical tables as refugees it is well known that the majority of those who have entered Canada from Europe in recent years belong to that category.

Some thousands of refugees were admitted to Canada during the fiscal year under review. For the most part these belonged to one or other of the following groups:—

(1) Dependent relatives and members of families where a part of the family had become established in Canada;
(2) Persons with ample funds to provide for their own maintenance.
(3) Technicians and skilled workers whose services were likely to be useful in the Dominion.
(4) Persons or families bringing new industries to Canada and capital for their establishment.

The last named group was the largest and most important. Scores of new industries have been secured and are in process of being established throughout the Dominion. This has resulted in the employment of some thousands of Canadian workers, and only the first chapter has been written.

Sudeten Settlers

In last year's Report reference was made to the arrival in Canada of 303 families and 72 single men formerly resident in the Sudeten area of Czechoslovakia. Half of these were placed on farms in the St. Walburg district of Saskatchewan under the guidance of the Canadian National Railways Colonization Department; the other half were placed under Canadian Pacific Railway Colonization auspices in the Tupper Creek area of British Columbia

When this settlement project was under discussion with Czech leaders who visited Canada in the autumn of 1938, it was expected that not only the number would be much larger than the number which actually arrived, but also that most of them would have their own funds for settlement on the land. Germany's sudden move into Czechoslovakia prevented many leaving the country and those who were able to leave were with few exceptions unable to take any capital with them. In these circumstances funds were later secured through London, averaging approximately $1,500 per family. These funds were not regarded as the property of the individual settlers, but were placed in the hands of the Canadian Government for the purpose of settling these people on the land. The haste with which they had to be moved prevented any careful selection. Assurance was offered by the leaders that they would all be suitable for pioneer settlement on the land, that all had some knowledge of farming acquired through working part-time on small holdings in their own country. The Czechs had not been long in Canada before it was discovered that few had any practical knowledge of farming and the first year they were in Canada was spent mainly in acquiring a rudimentary knowledge of agriculture including the care of stock and the use of equipment.

Those settled in the St. Walburg area were placed on farms that had been to some extent under cultivation and on most of these there were farm buildings in various stages of repair. These farms were acquired in the names of the settlers, and practical men were employed to teach the newcomers. It was necessary during the first year, and sometimes longer, to provide a maintenance allowance for these settlers. In the Tupper Creek area a large ranch was secured which had never been sub-divided and on which there had been very little cultivation. There a development company was formed and stock and equipment were purchased and development work carried on as a community enterprise for the benefit of the settlers. Instead of immediately assigning a piece of land and furnishing stock and equipment to a settler with instructions to do his own breaking, power-breaking outfits were secured and an area on each farm holding was brought under cultivation. Some houses were erected which were later moved to individual farms. At the close of the year most of the settlers are expected to be on places of their own.

Some difficulties have been experienced both at St. Walburg and Tupper Creek because of the lack of knowledge of farming on the part of settlers. The patience of the practical men engaged to direct the work of these settlers has had its reward, as many of the settlers have shown a desire to learn and a willingness to follow the directions of those whose sole interest was in their success.

Other difficulties arose through the fact that some settlers apparently had no real intention of settling on the land, but were more interested in trading or in finding industrial or clerical work which bore no relation to land settlement. Well-meaning people with a desire to help but having no greater knowledge of land settlement problems than the Sudetens themselves have occasionally

criticized the efforts to get these people established and this has at times created discontent. The work of the Colonization Departments of the two Canadian railway companies is wholly commendable and while it is too much to expect that anything like 100 per cent of the families and the single men who came to Canada will become permanent settlers on the land, the project has developed to the point where it is apparent that a large proportion of them are already fairly well established and with the present increasing prices of farm produce they have a reasonable prospect of making their permanent homes on the land.

CHINESE IMMIGRATION

The present Chinese Immigration Act which came into effect on June 30, 1923, provides for the entry to Canada of the following classes:

(*a*) Members of the diplomatic corps, consuls, consular agents and other Government representatives, their suites and servants;

(*b*) Children born in Canada of parents of Chinese origin or descent, who left Canada for educational or other purposes, on establishing their identity to the satisfaction of the controller at the port where they seek re-entry;

(*c*) (i) Merchants, as defined by regulations made by the Minister; (ii) students entering Canada for the purpose of attendance, and while in actual attendance at any Canadian university or college authorized by statute or charter to confer degrees;

(*d*) Persons in transit through Canada.

There were during the fiscal year 1940-41 no Chinese immigrants admitted; for the full period that the Act has been in effect, 6 Chinese immigrants have landed in Canada. Twenty-four students entered as non-immigrants during the year under review to attend universities; this movement has been larger than usual owing to war conditions in Europe. Upon completion of their studies these students will return to their homeland.

The Minister has authority to grant temporary entry, under permit, for a specified period only, to persons of Chinese origin without such persons being subject to the provisions of the Act. During 1940-41, 79 permits were issued as follows:

Actors	36	Actresses	18
Amahs	5	Doctors	2
Housewives	2	Infants	2
Merchants	2	Missionary	1
Servants	2	Students	7
Teachers	2		

Of the above, 20 have already left Canada and the remainder will depart within the period of validity of their respective permits. Bonds are required in the cases of actors, amahs, servants, teachers, etc., who are temporarily admitted under permit, such bonds guaranteeing that the persons concerned will adhere to the conditions of their entry.

The Act provides for registration prior to departure, and the right to return following an absence of two years of Chinese legally admitted to and lawfully resident in Canada. Owing to abnormal conditions in the Far East, the number of registrations during the past few years has been well below the previous yearly average; 515 Chinese registered outward during 1940-41. Seventy-six Chinese left Canada without registering and 130 allowed their registrations to lapse; these have forfeited their right to return. A total of 122 Chinese employed as seamen on vessels trading in international waters registered during the period under review.

Owing to conditions arising out of the war in China a considerable number of Chinese who had registered out from Canada in accordance with the requirements of the Chinese Immigration Act have been unable, through lack of transportation facilities and other factors beyond their control, to return to Canada

within the period of two years and in view of this an Order in Council was passed on December 31, 1940, under the authority of the War Measures' Act providing that all persons of Chinese origin or descent who registered outward on or after December 1, 1938, and all persons of Chinese origin or descent who may register outward on or before December 31, 1941, may delay their return to Canada for a period of two years over and above the statutory period of two years as provided by Section 24 of the Chinese Immigration Act.

The Opium and Narcotic Drug Act and the Immigration Act provide for the deportation of aliens convicted under certain sections of the first mentioned Act; during 1940-41, 23 Chinese were so deported.

The Chinese Immigration Act is administered under the direction of the Minister by the Chief Controller and Controllers at designated Canadian ports of entry. The Department maintains a special staff on the Pacific Coast and a special representative in Hong Kong dealing solely with the administration of the said Act. Particular care is taken in the checking, both inward and outward, of Chinese crews. Ship owners and agents have special guards on duty during the period vessels are in port. There were but three desertions during the year, for which ship owners paid $3,000 in penalties under the Act.

Total revenue collected during 1940-41 was $5,633.85.

For the purpose of comparison, the following table relating to Chinese immigration is furnished:—

—	Exemptions	Paying Tax	Percentage of Total Arrivals Admitted Exempt	Registered for Leave	Total Revenue
					$ cts.
1923–24	49	625	7·27	5,661	334,039 00
1924–25	.....	.....	.....	5,992	308,659 00
1925–26	.....	.....	.....	3,947	25,969 00
1926–27	.....	.....	.....	5,987	14,844 00
1927–28	1	2	33·33	5,087	25,679 00
1928–29	1	.....	100·00	5,480	30,795 00
1929–30	.....	.....	.....	5,682	30,799 00
1930–31	.....	.....	.....	5,783	28,846 00
1931–32	.....	.....	.....	4,387	11,584 00
1932–33	1	.....	100·00	3,626	9,152 00
1933–34	2	.....	100·00	2,156	7,237 00
1934–35	.....	.....	.....	2,103	6,506 00
1935–36	.....	.....	.....	2,138	6,501 00
1936–37	1	.....	100·00	2,059	9,893 00
1937–38	.....	.....	.....	792	2,359 00
1938–39	.....	.....	.....	817	2,959 00
1939–40	.....	.....	.....	933	4,066 00
1940–41	.....	.....	.....	637	5,633 85
	55	627	8·07	63,267	865,520 85

MOVEMENT OF BRITISH CHILDREN

Immediately on the outbreak of war, Britain evacuated a million and a half children and their mothers from London and other centres of population to town, village, and country homes in England and Scotland. At that time a suggestion was made that some of these children be brought to Canada. This did not develop because parents evinced little interest in sending their children so far from home. It was not until after the fall of the Low Countries and France and the increased danger of bombing in Britain, that parents overseas showed a desire to have their children sent to Canada and by the time this took place a shipping problem had developed on the North Atlantic.

At the beginning the movement consisted mainly of British mothers and young children who came on the invitation of relatives and friends but later it developed to a movement of unaccompanied children whose parents paid

their way, to children from private schools, and to others whose transportation was supplied by the United Kingdom and Dominion Governments. By the end of the current year upwards of 6,000 children had arrived belonging to the following groups:

1. Children accompanying their mothers or other relatives numbered 2,586. The number of mothers accompanying exceeded 1,200.
2. Children moving privately and joining relatives or friends in Canada or coming to private schools. The number of these was 1,836.
3. Assisted children whose passage was provided by the United Kingdom Government and the Dominion Government. These totalled 1,532.

When it became evident that parents in Britain were willing to have their children sent overseas, an arrangement was made between the United Kingdom Government and the Dominion Government to provide transportation and care. The ocean passage plus ocean escort officers was supplied by London, and rail fare in Canada, food, medical care, and escort was provided by the Dominion Government. The need of Federal-Provincial co-operation was evident from the outset and at a Conference held in the spring of 1940, an agreement was reached under which all matters of reception in the provinces, placement in private homes, and aftercare were handled by the provinces through Children's Aid Societies or other child-caring agencies.

Owing to British exchange regulations, it was not possible for parents to send funds for the support of their children nor was it possible for British wives to have sterling funds transferred for their support here. Children evacuated from cities to the countryside in Britain were supported at a weekly rate paid by parents and by Government. In the Dominion, however, free homes were offered in such numbers that it was possible to place British children as guests in Canadian homes where they were treated and provided for as members of the family, with the exception in some cases of clothing, hospitalization, dental and medical care. While the provinces and the Children's Aid Societies utilize all their existing organizations for the care of the children, without charge, any extra expense in staff, reception, maintenance, transportation, replacement, hospitalization and medical care, may be charged back to the Federal Government.

It is impossible to speak too highly of the splendid and whole-hearted co-operation that has existed between the provinces, their co-ordinating societies, and the Federal Government, and of the high standard of the foster homes offered by residents of Canada.

The story of the coming of British children would not be complete without a reference to the National Advisory Committee for Children from Overseas. This Committee was set up in the summer of 1940 in anticipation of a much larger movement of children than actually took place. Its Chairman is Dr. R. C. Wallace, M.A., D.Sc., Ph.D., LL.D., Principal of Queen's University. The Committee is composed of prominent Canadians resident in the various provinces, and as its name indicates is purely an advisory body whose recommendations are made to the Minister of Mines and Resources. Between General Meetings the Committee functions through an Executive which holds periodical meetings in Ottawa for the consideration of all problems relating to the welfare of British guest children while in the Dominion. The Committee also receives donations towards the care of children and all expenditures incurred by the provinces or their co-ordinating societies are paid by the Committee either out of donations which the Committee receives from public-spirited citizens or bodies or by grants made by the Federal Government.

In the autumn of 1940 two ships carrying children to Canada were torpedoed in the Atlantic. These incidents brought to an unexpected and regretted end a movement which had aroused the greatest interest throughout Canada and had moved at least 50,000 Canadians to offer their homes for the accommodation of British guest children for the duration of the war.

TABLE 1

Immigration to Canada from 1900 to 1941

	Via Ocean Ports			From U.S.A.				Grand Totals
	British Nationals	Others	Totals	U.S.A. Citizens	British Nationals	Others	Totals	
Six months ended June 30, 1900..	5,141	10,211	15,352	.....	.....	.....	8,543	23,895
Fiscal year ended June 30, 1901..	11,813	19,349	31,162	.....	.....	.....	17,987	49,149
" " 1902..	17,270	23,721	40,991	.....	.....	.....	26,388	67,379
" " 1903..	42,200	36,691	78,891	.....	.....	.....	49,473	128,364
" " 1904..	51,050	34,110	85,160	12,648	4,145	23,946	40,739	125,899
" " 1905..	65,967	36,756	102,723	15,477	2,263	22,190	39,930	142,653
" " 1906..	88,174	43,094	131,268	33,013	2,108	17,675	52,796	184,064
Nine months ended March31,1907..	59,272	30,736	90,008	20,479	1,309	10,369	32,157	122,165
Fiscal year ended March 31, 1908..	126,783	77,374	204,157	31,411	2,674	19,067	53,152	257,309
" " 1909..	55,463	31,613	87,076	33,474	2,894	17,926	54,294	141,370
" " 1910..	63,757	41,239	104,996	65,190	3,662	22,196	91,048	196,044
" " 1911..	126,170	63,463	189,633	77,353	5,007	22,524	104,884	294,517
" " 1912..	141,504	79,023	220,527	91,840	6,236	16,250	114,326	334,853
" " 1913..	152,373	111,050	263,423	92,061	7,398	19,959	119,418	382,841
" " 1914..	144,513	132,835	277,348	74,745	6,374	8,773	89,892	367,240
" " 1915..	44,117	40,893	85,010	34,745	3,541	3,482	41,768	126,778
" " 1916..	9,032	2,568	11,600	21,370	2,796	1,687	25,853	37,453
" " 1917..	9,980	4,005	13,985	43,261	3,324	4,558	51,143	65,128
" " 1918..	4,879	2,881	7,760	47,818	3,444	6,923	58,185	65,945
" " 1919..	10,701	6,286	16,987	28,280	1,725	1,950	31,955	48,942
" " 1920..	60,659	7,021	67,680	36,628	2,250	1,850	40,728	108,408
" " 1921..	75,783	24,635	100,418	33,891	2,768	1,651	38,310	138,728
" " 1922..	39,606	21,048	60,654	18,782	1,825	1,063	21,670	82,324
" " 1923..	36,360	14,520	50,880	14,035	1,641	830	16,566	67,446
" " 1924..	78,740	49,299	128,039	14,928	1,478	805	17,211	145,250
" " 1925..	54,943	40,601	95,544	13,171	1,794	853	15,818	111,362
" " 1926..	37,569	39,717	77,286	15,442	2,251	1,085	18,778	96,064
" " 1927..	50,378	72,586	122,964	17,820	2,239	966	21,025	143,989
" " 1928..	51,552	75,041	126,593	21,260	2,696	1,051	25,007	151,600
" " 1929..	59,497	77,666	137,163	26,539	3,061	960	30,560	167,723
" " 1930..	64,962	67,599	132,561	26,751	3,121	855	30,727	163,288
" " 1931..	28,144	35,799	63,943	20,723	2,938	619	24,280	88,223
" " 1932..	7,332	4,123	11,455	12,277	1,815	205	14,297	25,752
" " 1933..	3,283	3,303	6,586	11,172	1,806	218	13,196	19,782
" " 1934..	2,454	3,709	6,163	6,545	1,032	163	7,740	13,903
" " 1935..	2,408	3,768	6,176	5,104	769	87	5,960	12,136
" " 1936..	2,264	3,718	5,982	4,322	709	90	5,121	11,103
" " 1937..	2,521	4,389	6,910	4,301	742	70	5,113	12,023
" " 1938..	3,351	6,651	10,002	4,727	852	64	5,643	15,645
" " 1939..	3,831	7,634	11,465	4,685	917	61	5,663	17,128
" " 1940..	3,962	6,495	10,457	4,383	1,234	131	5,748	16,205
" " 1941..	3,428	625	4,053	5,295	2,064	84	7,443	11,496

TABLE 2

Immigration to Canada for the Period July 1, 1900, to March 31, 1910

—	Fiscal Years										Totals
	1900-1901	1901-1902	1902-1903	1903-1904	1904-1905	1905-1906	Nine Months Ended March 31, 1907	1907-1908	1908-1909	1909-1910	
English	9,331	12,783	32,087	36,003	48,847	65,135	41,156	90,380	37,019	40,416	413,157
Irish	933	1,311	2,236	3,128	3,998	5,018	3,404	6,547	3,609	3,940	34,124
Scotch	1,476	2,853	7,046	10,552	11,744	15,846	10,729	22,223	11,810	14,706	108,985
Welsh	70	312	423	691	770	797	502	1,032	463	728	5,788
Totals	11,810	17,259	41,792	50,374	65,359	86,796	55,791	120,182	52,901	59,790	562,054
African, South	.....	.....	.....	21	35	46	23	76	53	97	351
Arabian	98	70	46	58	48	19	31	50	4	14	438
Armenian	62	112	113	81	78	82	208	563	79	75	1,453
Australian	3	11	46	58	204	322	185	180	171	203	1,383
Austro-Hungarian	5,692	8,557	13,095	11,137	10,089	10,170	4,045	21,376	10,798	9,757	104,716
Brazilian	.....	.....	.....	2	1	2	5	1	4	.....	15
Bulgarian	.....	1	7	14	2	71	179	2,529	56	557	3,416
Chinese	7	2	.....	.....	.....	18	92	1,884	1,887	2,156	6,046
Doukhobor	.....	12	.....	.....	24	204	.....	.....	.....	.....	240
Dutch	25	35	223	169	281	389	394	1,212	495	741	3,964
East Indian	.....	.....	.....	.....	45	387	2,124	2,623	6	10	5,195
Egyptian	1	3	1	3	2	18	10	8	2	2	50
Finnish	682	1,292	1,734	845	1,323	1,103	1,049	1,212	669	1,457	11,366
French and Belgian	492	654	1,240	2,392	2,539	2,754	1,964	3,885	2,658	2,637	21,215
German	984	1,048	1,887	2,985	2,759	1,796	1,903	2,377	1,340	1,533	18,612
Greek	81	161	193	191	98	254	545	1,053	192	452	3,220
Hebrew	2,765	1,015	2,066	3,727	7,715	7,127	6,584	7,712	1,636	3,182	43,529
Italian	4,710	3,828	3,371	4,445	3,473	7,959	5,114	11,212	4,228	7,118	55,458
Japanese	6	.....	.....	.....	354	1,922	2,042	7,601	495	271	12,691
Malay	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	5
Maltese	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	2
Mennonite	.....	52	38	11	.....	.....	.....	.....	.....	.....	101
Negro	.....	.....	.....	.....	5	42	108	136	73	7	371
Newfoundland	.....	.....	335	519	190	340	1,029	3,374	2,108	3,372	11,267
New Zealand	.....	.....	2	23	57	89	30	70	65	82	418
Persian	.....	1	40	5	8	7	31	7	1	5	105
Polish	162	230	274	669	745	725	1,033	1,593	376	1,407	7,214
Portuguese	.....	.....	.....	.....	1	6	2	2	2	2	15
Roumanian	152	551	438	619	270	396	431	949	278	293	4,377
Russian	1,044	2,467	5,505	1,955	1,887	3,152	1,927	6,281	3,547	4,564	32,329
Scandinavian	1,750	2,451	5,448	4,203	4,118	3,859	2,296	4,073	2,082	3,782	34,062
Serbian	23	.....	2	10	7	19	4	48	31	76	220
Spanish	14	1	7	5	10	12	29	61	32	42	213
Swiss	30	17	73	128	150	172	112	195	129	211	1,217
Syrian	464	1,066	847	369	630	336	277	732	189	195	5,105
Turkish	37	17	43	29	30	357	232	489	236	517	1,987
U.S.A. citizens, via ocean ports	68	73	.....	58	109	123	89	133	94	186	933
West Indian	.....	.....	23	55	77	194	90	278	159	203	1,079
Total Continental, etc.	19,352	23,732	37,099	34,786	37,364	44,472	34,217	83,975	34,175	45,206	394,378
From the United States	17,987	26,388	49,473	40,739	39,930	52,796	32,157	53,152	54,294	91,048	457,964
Total immigration	49,149	67,379	128,364	125,899	142,653	184,064	122,165	257,309	141,370	196,044	1,414,396

TABLE 3
Immigration to Canada for the Period April 1, 1910, to March 31, 1920

—	Fiscal Years										Totals
	1910–1911	1911–1912	1912–1913	1913–1914	1914–1915	1915–1916	1916–1917	1917–1918	1918–1919	1919–1920	
English	84,707	95,107	108,082	102,122	30,807	5,857	5,174	2,477	7,954	45,173	487,460
Irish	6,877	8,327	9,706	9,585	3,525	818	958	174	336	2,751	43,057
Scotch	29,924	32,988	30,735	29,128	8,346	1,887	2,062	473	1,518	10,997	148,058
Welsh	1,505	1,699	2,019	1,787	598	102	88	54	106	682	8,640
Totals	123,013	138,121	150,542	142,622	43,276	8,664	8,282	3,178	9,914	59,603	687,215
African, South	86	144	22	56	23	11	1	4	.....	23	370
Albanian	.....	.....	.....	3	4	.....	.....	.....	.....	.....	7
Arabian	3	2	10	16	.....	.....	.....	.....	.....	.....	31
Argentinian	.....	.....	.....	2	5	.....	.....	.....	.....	2	9
Armenian	20	60	100	139	36	.....	3	2	.....	10	370
Australian	266	184	106	106	51	32	18	34	35	88	920
Austro-Hungarian	16,285	21,651	21,875	28,323	7,150	15	1	.....	2	8	95,310
Belgian	1,563	1,601	1,826	2,651	1,149	172	126	19	48	1,532	10,687
Brazilian	13	.....	.....	5	.....	2	.....	.....	.....	.....	20
Bulgarian	1,068	3,295	4,616	1,727	4,048	1	.....	.....	.....	1	14,756
Chinese	5,278	6,247	7,445	5,512	1,258	88	393	769	4,333	544	31,867
Cuban	.....	.....	.....	10	1	1	3	1	.....	2	18
Doukhobor	41	24	108	4	.....	.....	.....	.....	.....	.....	177
Dutch	931	1,077	1,524	1,506	605	186	151	94	59	154	6,287
East Indian	5	3	5	88	.....	1	.....	.....	.....	.....	102
Egyptian	3	.....	7	5	.....	.....	.....	.....	.....	.....	15
Finnish	2,132	1,646	2,391	3,183	459	139	249	113	2	44	10,358
French	2,041	2,094	2,755	2,683	1,206	180	199	114	222	1,584	13,078
German	2,533	4,664	4,953	5,537	2,472	27	9	1	1	12	20,209
Greek	777	693	1,390	1,102	1,147	145	258	45	4	39	5,600
Hebrew	5,146	5,322	7,387	11,252	3,107	65	136	32	22	116	32,585
Italian	8,359	7,590	16,601	24,722	6,228	388	758	189	49	1,165	66,049
Japanese	437	765	724	856	592	401	648	883	1,178	711	7,195
Macedonian	.....	.....	.....	17	132	.....	.....	.....	.....	.....	149
Maltese	.....	.....	128	402	19	4	109	144	2	405	1,213
Mexican	.....	3	9	9	.....	.....	.....	1	3	.....	25
Montenegrin	.....	.....	36	13	9	.....	1	.....	.....	.....	59
Negro	12	138	211	266	202	34	98	35	22	61	1,079
Newfoundland	2,229	2,598	1,036	496	338	255	1,243	1,199	512	443	10,349
New Zealand	116	61	39	24	21	18	12	13	15	31	350
Persian	19	19	20	19	7	3	.....	2	2	.....	91
Polish	2,177	5,060	9,945	9,793	1,976	8	12	.....	4	76	29,051
Portuguese	13	6	9	58	8	.....	1	1	.....	3	99
Roumanian	511	793	1,116	1,504	361	4	4	.....	.....	21	4,314
Russian	6,621	9,805	18,623	24,485	5,201	40	25	42	42	51	64,935
Scandinavian—											
Danish	535	628	798	871	326	167	145	74	44	233	3,821
Icelandic	250	205	231	292	145	15	9	3	12	11	1,173
Norwegian	2,169	1,692	1,832	1,647	788	232	303	235	91	179	9,168
Swedish	3,213	2,394	2,477	2,435	916	177	332	156	101	241	12,442
Serbian	50	209	366	193	220	6	1	.....	1	12	1,058
Spanish	197	191	296	1,138	755	11	76	28	12	15	2,719
Swiss	270	230	246	269	209	42	30	12	11	100	1,419
Syrian	124	144	232	278	79	3	9	2	.....	18	889
Turkish	469	632	770	187	33	.....	5	.....	.....	1	2,097
U.S.A. citizens, via ocean ports	203	143	121	121	41	15	20	28	21	55	768
West Indian	455	393	495	719	389	47	315	307	223	66	3,409
Others	.....	.....	.....	2	18	1	.....	.....	.....	20	41
Total, Continental, etc	66,620	82,406	112,881	134,726	41,734	2,936	5,703	4,582	7,073	8,077	466,738
From the United States	104,884	114,326	119,418	89,892	41,768	25,853	51,143	58,185	31,955	40,728	678,152
Total immigration	294,517	334,853	382,841	367,240	126,778	37,453	65,128	65,945	48,942	108,408	1,832,105

TABLE 4

Immigration to Canada for the Period April 1, 1920, to March 31, 1925

	Fiscal Years					Totals
	1920-1921	1921-1922	1922-1923	1923-1924	1924-1925	
English	47,687	23,225	19,188	37,030	26,466	153,596
Irish	6,384	3,572	3,668	9,719	9,379	32,722
Scotch	19,248	11,596	11,071	25,057	16,174	83,146
Welsh	943	627	581	1,113	1,159	4,423
Totals	74,262	39,020	34,508	72,919	53,178	273,887
African, South	63	32	41	60	87	283
Albanian	6	6	1	7	2	22
Arabian	8	5	2	.....	.....	15
Argentinian	4	.....	4	.....	.....	8
Armenian	85	70	59	486	304	1,004
Australian	90	76	67	112	162	507
Austrian	36	14	23	82	75	220
Belgian	1,645	503	316	1,662	1,300	5,426
Bermudian	8	2	7	4	4	25
Brazilian	.....	.....	.....	.....	1	1
Bulgarian	4	27	19	267	69	386
Chilean	.....	.....	.....	.....	3	3
Chinese	2,435	1,746	711	674	.....	5,566
Cuban	.....	.....	.....	1	.....	1
Czecho-Slovakian	308	152	101	2,757	2,084	5,402
Dutch	595	183	119	1,149	1,637	3,683
East Indian	10	13	21	40	46	130
Egyptian	9	2	.....	3	3	17
Esthonian	.....	.....	12	51	49	112
Finnish	1,401	274	1,171	7,640	4,261	14,747
French	861	332	281	370	326	2,170
German	137	178	216	1,769	2,215	4,515
Greek	357	209	177	292	237	1,272
Hebrew	2,763	8,404	2,793	4,255	4,459	22,674
Hungarian	23	48	23	364	1,052	1,510
Italian	3,880	2,413	2,074	6,379	2,349	17,095
Jamaican	18	13	30	24	8	93
Japanese	532	471	369	448	501	2,321
Jugo-Slavian	89	180	136	1,306	1,620	3,331
Latvian	.....	.....	1	11	20	32
Lettish	.....	.....	.....	6	2	8
Lithuanian	.....	19	106	236	125	486
Luxemburg	16	5	3	85	35	144
Maltese	140	34	57	148	26	405
Mexican	1	.....	.....	1	.....	2
Negro	144	42	42	42	39	309
Newfoundland	1,042	367	1,552	5,346	1,288	9,595
New Zealand	40	25	33	50	107	255
Persian	1	9	1	5	18	34
Polish	4,061	2,707	2,921	4,211	2,734	16,634
Portuguese	4	.....	2	.....	3	9
Roumanian	969	759	427	1,431	2,056	5,642
Russian	1,077	321	222	3,058	5,411	10,089
Scandinavian—						
Danish	511	541	382	1,355	1,830	4,619
Icelandic	50	31	21	27	49	178
Norwegian	429	480	507	2,424	2,550	6,390
Swedish	715	442	948	3,536	2,138	7,779
Spanish	202	6	15	39	3	265
Swiss	235	187	152	1,585	680	2,839
Syrian	443	123	91	286	210	1,153
Turkish	8	3	3	27	29	70
Ukrainian	491	89	36	832	26	1,474
U.S.A. citizens, via ocean ports	110	67	32	134	96	439
Venezuelan	.....	.....	1	6	.....	7
West Indian	110	24	44	37	37	252
Total, Continental, etc.	26,156	21,634	16,372	55,120	42,366	161,648
From the United States	38,310	21,670	16,566	17,211	15,818	109,575
Total immigration	138,728	82,324	67,446	145,250	111,362	545,110

TABLE 5

Immigration to Canada for the Period April 1, 1925, to March 31, 1930

	Fiscal Years					Totals
	1925-1926	1926-1927	1927-1928	1928-1929	1929-1930	
English	19,689	24,890	25,991	30,355	32,278	133,203
Irish	5,993	9,187	8,756	9,199	10,159	43,294
Scotch	10,295	14,296	14,341	16,137	18,640	73,709
Welsh	1,053	1,411	1,784	3,189	3,005	10,442
Totals	37,030	49,784	50,872	58,880	64,082	260,648
Albanian	14	17	30	28	26	115
Arabian	10	4	6	1	7	28
Armenian	85	65	44	17	14	225
Belgian	1,063	2,080	2,171	1,222	696	7,232
Bohemian	8	22	7	8	20	65
Bulgarian	47	126	249	282	296	1,000
Chinese			3	1		4
Croatian	1,006	1,085	902	990	771	4,754
Czech	805	721	714	846	434	3,520
Dalmatian	1			1	7	9
Dutch	1,180	1,674	1,928	1,590	1,755	8,136
East Indian	62	60	56	52	58	288
Esthonian	28	92	110	92	117	439
Finnish	1,617	5,180	4,765	3,651	4,565	19,778
French	498	548	868	745	697	3,356
German	7,431	12,941	12,638	13,215	14,718	60,943
Greek	217	340	583	736	634	2,510
Hebrew	3,587	4,471	4,296	3,301	3,544	19,199
Herzegovinian		3	4			7
Italian	1,638	3,301	3,593	792	1,277	10,601
Japanese	421	475	478	445	194	2,013
Jugo-Slavian	1,604	2,084	1,450	2,824	921	8,883
Korean		1				1
Lettish	24	60	77	74	70	305
Lithuanian	165	842	1,037	1,608	964	4,613
Magyar	4,112	4,863	5,318	6,242	5,688	26,226
Maltese	21	33	39	18	40	151
Mexican		1				1
Montenegrin		5				5
Moravian	6	36	33	4	23	102
Negro	53	51	88	96	195	483
Persian	11	6	4	1	1	23
Polish	2,535	6,505	6,733	8,269	6,610	30,652
Portuguese	3	14	7	12	13	49
Roumanian	265	292	237	284	383	1,461
Russian	925	1,127	948	908	765	4,673
Ruthenian	4,259	9,995	10,128	15,571	11,291	51,244
Scandinavian—						
Danish	1,112	2,030	3,835	3,311	2,685	12,973
Icelandic	53	30	28	24	6	141
Norwegian	1,072	3,384	4,327	2,434	2,256	13,473
Swedish	1,335	2,628	3,134	3,297	2,918	13,312
Serbian	454	885	411	390	375	2,515
Slovak	2,046	4,274	3,714	4,303	2,879	17,216
Spanish	12	29	28	18	26	113
Spanish American		6		3		9
Swiss	320	568	614	490	473	2,465
Syrian	134	218	82	75	61	570
Turkish	17	8	4	3	6	38
Total, Continental, etc	40,256	73,180	75,721	78,283	68,479	335,919
From the United States	18,778	21,025	25,007	30,560	30,727	126,097
Total immigration	96,064	143,989	151,600	167,723	163,288	722,664

TABLE 6

Immigration to Canada for the Period April 1, 1930, to March 31, 1935

	Fiscal Years					Totals
	1930-1931	1931-1932	1932-1933	1933-1934	1934-1935	
English	14,662	4,275	1,940	1,375	1,380	23,632
Irish	4,233	791	323	283	291	5,921
Scotch	7,372	1,843	764	547	472	11,498
Welsh	317	179	70	55	55	1,176
Totals	27,584	7,088	3,097	2,260	2,198	42,227
Albanian	25	5	.....	1	3	34
Arabian	2	.....	2	.....	1	5
Armenian	21	4	1	7	1	34
Belgian	255	47	37	41	61	441
Bohemian	11	.....	7	.....	.....	18
Bulgarian	295	15	3	12	5	330
Chinese	.....	.....	1	2	.....	3
Croatian	492	106	96	108	155	947
Czech	225	69	65	52	77	488
Dutch	344	33	33	27	44	481
East Indian	80	47	62	33	33	255
Esthonian	63	6	.....	2	2	73
Finnish	2,297	92	30	51	59	2,529
French	347	87	88	74	86	682
German	7,840	727	518	401	301	9,787
Greek	388	20	37	34	35	514
Hebrew	2,908	202	346	599	335	4,390
Italian	1,007	414	255	267	325	2,268
Japanese	204	195	115	104	93	711
Jugo-Slavian	364	57	56	63	120	660
Lettish	28	4	.....	4	.....	36
Lithuanian	466	45	57	37	37	642
Magyar	2,401	397	364	509	362	4,033
Maltese	13	5	2	.....	.....	20
Montenegrin	3	.....	.....	.....	.....	3
Moravian	2	.....	3	.....	.....	5
Negro	120	15	9	19	5	168
Persian	2	.....	1	.....	.....	3
Polish	3,997	554	360	374	406	5,691
Portuguese	5	2	1	2	2	12
Roumanian	179	22	26	27	52	306
Russian	879	74	62	61	60	1,136
Ruthenian	6,413	502	414	421	586	8,336
Scandinavian—						
Danish	820	53	55	43	21	992
Icelandic	25	.....	1	.....	1	27
Norwegian	740	70	44	31	37	922
Swedish	730	79	17	19	10	855
Serbian	140	31	26	37	25	259
Slovak	1,957	337	252	395	595	3,536
Spanish	8	9	7	7	7	38
Spanish American	1	2	.....	4	.....	7
Swiss	211	24	17	19	22	293
Syrian	54	15	19	14	13	115
Turkish	7	1	.....	2	.....	10
Total Continental, etc.	36,359	4,367	3,489	3,903	3,978	52,096
From the United States	24,280	14,297	13,196	7,740	5,960	65,473
Total immigration	88,223	25,752	19,782	13,903	12,136	159,796

TABLE 7

Immigration to Canada for the Period April 1, 1935, to March 31, 1941

	Fiscal Years						Totals
	1935-1936	1936-1937	1937-1938	1938-1939	1939-1940	1940-1941	
English	1,286	1,445	1,949	2,247	2,489	2,408	11,824
Irish	249	262	364	387	375	235	1,872
Scotch	484	519	604	665	643	406	3,321
Welsh	30	38	55	74	59	55	311
Totals	2,049	2,264	2,972	3,373	3,566	3,104	17,328
Albanian	1	4	8	10	4	.....	27
Arabian	.....	.....	4	4	.....	.....	8
Armenian	4	3	4	5	2	2	20
Belgian	72	93	123	187	100	30	605
Bohemian	1	1	5	2	332	3	344
Bulgarian	22	18	28	29	15	1	113
Chinese	.....	1	.....	.....	.....	.....	1
Croatian	157	240	277	265	106	7	1,052
Czech	106	134	188	169	290	49	936
Dalmatian	.....	1	.....	1	.....	.....	2
Dutch	111	90	119	237	264	51	872
East Indian	20	13	14	14	11	6	78
Esthonian	2	5	2	12	3	1	25
Finnish	43	49	79	58	57	2	288
French	95	135	134	138	152	129	783
German	209	367	523	586	1,021	39	2,745
Greek	53	75	115	127	115	26	511
Hebrew	655	391	317	621	1,321	284	3,589
Italian	341	299	408	365	186	43	1,642
Japanese	83	103	139	46	36	44	451
Jugo-Slavian	106	106	116	250	55	1	634
Lettish	3	2	11	4	3	1	24
Lithuanian	22	42	37	39	49	6	195
Magyar	314	328	622	532	329	35	2,160
Maltese	.....	4	2	1	.....	.....	7
Mexican	.....	6	1	2	.....	.....	9
Montenegrin	.....	.....	2	8	.....	.....	10
Moravian	.....	.....	3	9	52	2	66
Negro	3	5	9	7	7	45	76
Persian	.....	1	2	.....	1	.....	4
Polish	362	432	615	586	297	25	2,317
Portuguese	4	2	1	1	1	4	13
Roumanian	33	65	77	102	20	6	303
Russian	84	79	120	134	134	9	560
Ruthenian	418	855	1,356	1,837	1,509	3	5,978
Scandinavian—							
Danish	21	22	40	49	71	22	225
Icelandic	6	.....	3	.....	.....	.....	9
Norwegian	31	25	27	21	40	21	165
Swedish	26	16	47	15	13	6	123
Serbian	29	35	83	70	17	7	241
Slovak	432	520	1,249	1,450	206	5	3,862
Spanish	6	10	14	6	9	19	64
Spanish American	.....	.....	3	.....	.....	2	5
Swiss	32	49	87	75	49	12	304
Syrian	26	19	15	18	14	1	93
Turkish	.....	1	1	.....	.....	.....	2
Total, Continental, etc.	3,933	4,646	7,030	8,092	6,891	949	31,541
From the United States	5,121	5,113	5,643	5,663	5,748	7,443	34,731
Total immigration	11,103	12,023	15,645	17,128	16,205	11,496	83,600

TABLE

Immigration to Canada, by Origins, via Ocean Ports, and from

	1931-32			1932-33			1933-34			1934-35		
	Via Ocean Ports	From U.S.A.	Totals	Via Ocean Ports	From U.S.A.	Totals	Via Ocean Ports	From U.S.A.	Totals	Via Ocean Ports	From U.S.A.	Totals
English	4,275	4,525	8,800	1,940	4,153	6,093	1,375	2,623	3,998	1,380	2,053	3,433
Irish	791	1,716	2,507	323	1,512	1,835	283	905	1,188	291	727	1,018
Scotch	1,843	1,732	3,575	764	1,747	2,511	547	1,038	1,585	472	734	1,206
Welsh	179	147	326	70	92	162	55	77	132	55	55	110
Totals	7,088	8,120	15,208	3,097	7,504	10,601	2,260	4,643	6,903	2,198	3,569	5,767
Belgian	47	31	78	37	42	79	41	23	64	61	18	79
Danish	53	87	140	55	53	108	43	47	90	21	28	49
Dutch	33	236	269	33	226	259	27	137	164	44	104	148
Finnish	92	38	130	30	29	59	51	16	67	59	21	80
French	87	2,734	2,821	88	2,702	2,790	74	1,130	1,204	86	809	895
German	727	1,532	2,259	518	1,180	1,698	401	755	1,156	301	656	957
Icelandic	.....	10	10	1	6	7	.....	10	10	1	12	13
Norwegian	70	171	241	44	218	262	31	108	139	37	93	130
Swedish	79	195	274	17	165	182	19	110	129	10	83	93
Swiss	24	28	52	17	41	58	19	30	49	22	21	43
Totals	1,212	5,062	6,274	840	4,662	5,502	706	2,366	3,072	642	1,845	2,487
Albanian	5	.....	5	.....	.....	.....	1	.....	1	3	.....	3
Arabian	.....	.....	.....	2	.....	2	.....	.....	.....	1	.....	1
Armenian	4	1	5	1	4	5	7	3	10	1	4	5
Bohemian	.....	21	21	7	16	23	.....	10	10	.....	9	9
Bulgarian	15	3	18	3	5	8	12	2	14	5	.....	5
Chinese	.....	.....	.....	1	.....	1	2	.....	2	.....	.....	.....
Croatian	106	5	111	96	4	100	108	6	114	155	.....	155
Czech	69	9	78	65	7	72	52	7	59	77	4	81
Dalmatian	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Indian	47	.....	47	62	1	63	33	.....	33	33	.....	33
Esthonian	6	1	7	.....	1	1	2	2	4	2	.....	2
Greek	20	43	63	37	32	69	34	26	60	35	17	52
Hebrew	202	447	649	346	426	772	599	344	943	335	289	624
Italian	414	166	580	255	142	397	267	109	376	325	56	381
Japanese	195	.....	195	115	.....	115	104	1	105	93	.....	93
Jugo-Slavian	57	9	66	56	11	67	63	3	66	120	2	122
Lettish	4	2	6	.....	4	4	4	.....	4	.....	.....	.....
Lithuanian	45	5	50	57	6	63	37	2	39	37	5	42
Magyar	397	41	438	364	20	384	509	18	527	362	20	382
Maltese	5	.....	5	2	4	6	.....	.....	.....	.....	.....	.....
Mexican	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montenegrin	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moravian	.....	1	1	3	.....	3	.....	.....	.....	.....	.....	.....
Negro	15	83	98	9	60	69	19	57	76	5	16	21
North American Indian	.....	34	34	.....	20	20	.....	8	8	.....	6	6
Persian	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....
Polish	554	103	657	360	99	459	374	50	424	406	40	446
Portuguese	2	2	4	1	6	7	2	4	6	2	3	5
Roumanian	22	15	37	26	11	37	27	7	34	52	5	57
Russian	74	32	106	62	35	97	61	16	77	60	25	85
Ruthenian	502	38	540	414	47	461	421	8	429	586	15	601
Serbian	31	16	47	26	18	44	37	10	47	26	3	29
Slovak	337	9	346	252	8	260	395	6	401	595	12	607
Spanish	9	11	20	7	16	23	7	6	13	7	7	14
Spanish American	2	.....	2	.....	1	1	4	.....	4	.....	.....	.....
Syrian	15	16	31	19	26	45	14	26	40	13	7	20
Turkish	1	1	2	.....	.....	.....	2	.....	2	.....	1	1
Totals	3,155	1,115	4,270	2,649	1,030	3,679	3,197	731	3,928	3,336	546	3,882
Grand Totals	11,455	14,297	25,752	6,586	13,196	19,782	6,163	7,740	13,903	6,176	5,960	12,136

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the United States, for the Period April 1, 1931, to March 31, 1941

1935-36			1936-37			1937-38			1938-39			1939-40			1940-41		
Via Ocean Ports	From U.S.A.	Totals	Via Ocean Ports	From U.S.A.	Totals	Via Ocean Ports	From U.S.A.	Totals	Via Ocean Ports	From U.S.A.	Totals	Via Ocean Ports	From U.S.A.	Totals	Via Ocean Ports	From U.S.A.	Totals
1,286	1,744	3,030	1,445	1,738	3,183	1,949	1,870	3,819	2,247	1,824	4,071	2,489	1,878	4,367	2,408	2,841	5,249
249	626	875	262	617	879	364	686	1,050	387	726	1,113	375	710	1,085	235	953	1,188
484	677	1,161	519	639	1,158	604	737	1,341	665	707	1,372	643	702	1,345	406	1,013	1,419
30	56	86	38	69	107	55	48	103	74	60	134	59	75	134	55	91	146
2,049	3,103	5,152	2,264	3,063	5,327	2,972	3,341	6,313	3,373	3,317	6,690	3,566	3,365	6,931	3,104	4,898	8,002
72	9	81	93	13	106	123	22	145	187	15	202	100	23	123	30	20	50
21	33	54	22	44	66	40	43	83	49	34	83	71	39	110	22	63	85
111	97	208	90	102	192	119	113	232	237	139	376	264	147	411	51	187	238
43	24	67	49	16	65	79	14	93	58	14	72	57	20	77	2	30	32
95	724	819	135	711	846	134	774	908	138	860	998	152	794	946	129	849	978
209	471	680	367	529	896	523	571	1,094	586	507	1,093	1,021	510	1,531	39	359	398
6	6	12	.....	2	2	3	5	8	.....	8	8	.....	4	4	.....	4	4
31	94	125	25	74	99	27	91	118	21	84	105	40	89	129	21	79	100
26	89	115	16	73	89	47	95	142	15	90	105	13	80	93	6	117	123
32	18	50	49	16	65	87	18	105	75	22	97	49	32	81	12	42	54
646	1,565	2,211	846	1,580	2,426	1,182	1,746	2,928	1,366	1,773	3,139	1,767	1,738	3,505	312	1,750	2,062
1	.....	1	4	.....	4	8	1	9	10	.....	10	4	.....	4	.....	.....	.....
.....	2	2	.....	.....	.....	4	.....	4	4	2	6	.....	.....	.....	.....	.....	.....
4	1	5	3	1	4	4	3	7	5	1	6	2	1	3	2	3	5
1	6	7	1	13	14	5	6	11	2	10	12	332	9	341	3	12	15
22	2	24	18	1	19	28	2	30	29	.....	29	15	.....	15	1	1	2
.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
157	.....	157	240	.....	240	277	4	281	265	3	268	106	2	108	7	6	13
106	1	107	134	4	138	188	3	191	169	4	173	290	3	293	49	18	67
.....	.....	.....	1	.....	1	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....
20	1	21	13	.....	13	14	.....	14	14	.....	14	11	.....	11	6	.....	6
2	.....	2	5	.....	5	2	1	3	12	.....	12	3	1	4	1	.....	1
53	19	72	75	20	95	115	11	126	127	10	137	115	10	125	26	20	46
655	225	880	391	228	619	317	267	584	621	269	890	1,321	302	1,623	284	342	626
341	49	390	299	58	357	408	69	477	365	58	423	186	64	250	43	85	128
83	.....	83	103	.....	103	139	.....	139	46	.....	46	36	.....	36	44	1	45
106	3	109	106	3	109	116	9	125	250	3	253	55	6	61	1	6	7
3	.....	3	2	3	5	11	.....	11	4	.....	4	3	2	5	1	6	7
22	3	25	42	10	52	37	6	43	39	6	45	49	5	54	6	8	14
314	22	336	328	11	339	622	24	646	532	22	554	329	37	366	35	21	56
.....	.....	.....	4	1	5	2	.....	2	1	5	6	.....	.....	.....	.....	4	4
.....	1	1	6	.....	6	1	.....	1	2	.....	2	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	2	.....	2	8	.....	8	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	3	.....	3	9	.....	9	52	.....	52	2	.....	2
3	20	23	5	17	22	9	17	26	7	24	31	7	22	29	45	30	75
.....	2	2	.....	2	2	.....	11	11	.....	13	13	.....	4	4	.....	16	16
.....	.....	.....	1	.....	1	2	1	3	.....	.....	.....	1	.....	1	.....	.....	.....
362	42	404	432	35	467	615	46	661	586	68	654	297	51	348	25	100	125
4	3	7	2	.....	2	1	2	3	1	2	3	1	3	4	4	2	6
33	4	37	65	2	67	77	11	88	102	2	104	20	8	28	6	4	10
84	13	97	79	19	98	120	22	142	134	14	148	134	47	181	9	31	40
418	8	426	855	15	870	1,356	13	1,369	1,837	19	1,856	1,509	16	1,525	3	19	22
29	.....	29	35	3	38	83	4	87	70	5	75	17	4	21	7	5	12
432	11	443	520	7	527	1,249	13	1,262	1,450	19	1,469	206	22	228	5	23	28
6	5	11	10	11	21	14	2	16	6	4	10	9	10	19	19	14	33
.....	.....	.....	.....	1	1	3	.....	3	.....	.....	.....	.....	1	1	2	2	4
26	10	36	19	5	24	15	8	23	18	10	28	14	15	29	1	16	17
.....	.....	.....	1	.....	1	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
3,287	453	3,740	3,800	470	4,270	5,848	556	6,404	6,726	573	7,299	5,124	645	5,769	637	795	1,432
5,982	5,121	11,103	6,910	5,113	12,023	10,002	5,643	15,645	11,465	5,663	17,128	10,457	5,748	16,205	4,053	7,443	11,496

TABLE 9

Number of Arrivals via Ocean Ports, Classified by Port of Entry and Class, for the Fiscal Year Ended March 31, 1941

Port of Entry	Number of Arrivals	Rejections	Immigrants	Returned Canadians Absent more than One Year				Other Persons Returning	Tourists, etc.
				Canadian Born	British Born outside Canada	Canadians Naturalized	Aliens with Domicile		
Quebec	10,063	19	950	960	463	55	3	934	7,261
North Sydney	10,435	47	956	107	24	2	1	3,311	5,987
Halifax	9,285	53	487	535	182	22	2	1,353	6,654
Saint John	1,360	8	198	117	40	9	.....	363	655
Montreal	862	51	95	53	13	2	1	152	485
Louisburg	774	.....	50	.....	.....	.....	.....	410	314
Sydney	100	4	8	1	1	.....	.....	.....	86
Port Alfred	68	.....	3	1	3	.....	.....	46	7
Charlottetown	57	.....	.....	.....	.....	.....	.....	26	31
Boucherville	15	.....	.....	.....	.....	.....	.....	1	14
Chatham	6	1	.....	.....	.....	.....	.....	.....	5
Dalhousie	2	.....	2	.....	.....	.....	.....	.....	.....
Pictou	1	1	.....	.....	.....	.....	.....	.....	.....
Windsor	1	.....	1	.....	.....	.....	.....	.....	.....
New York	600	29	571	.....	.....	.....	.....	.....	.....
Boston	14	1	13	.....	.....	.....	.....	.....	.....
Philadelphia	6	2	4	.....	.....	.....	.....	.....	.....
Vancouver	3,258	11	413	392	60	64	43	750	1,525
Victoria	578	.....	124	48	12	3	3	69	319
New Westminster	10	.....	8	.....	.....	.....	.....	.....	2
Union Bay	2	.....	.....	.....	.....	.....	.....	.....	2
Port Alberni	1	.....	1	.....	.....	.....	.....	.....	.....
Not given	179	9	169	.....	.....	.....	.....	.....	1
	38,324	236	4,053	2,214	798	157	53	7,465	23,348

TABLE 10

Comparative Statement—Immigration to Canada via Ocean Ports, by Months, for the Fiscal Year 1940-41, Compared with that of the Preceding Fiscal Year

	1939–40				1940–41			
	M.	F.	C.	Totals	M.	F.	C.	Totals
April	489	608	559	1,656	144	138	77	359
May	520	621	549	1,690	142	164	110	416
June	503	617	570	1,690	118	146	109	373
July	375	515	554	1,444	161	303	242	706
August	363	507	463	1,333	133	185	139	457
September	248	325	228	801	102	112	61	275
October	149	219	116	484	144	149	95	388
November	106	152	76	334	103	117	62	282
December	76	122	78	276	71	64	50	185
January	68	66	36	170	82	83	51	216
February	72	103	73	248	89	66	45	200
March	96	144	91	331	102	70	24	196
Totals	3,065	3,999	3,393	10,457	1,391	1,597	1,065	4,053

TABLE 11

Comparative Statement—Immigration from the United States to Canada, by Months, for the Fiscal Year 1940-41, Compared with that of the Preceding Fiscal Year

—	1939-40				1940-41			
	M.	F.	C.	Totals	M.	F.	C.	Totals
April	151	171	146	468	163	175	103	441
May	154	249	160	563	176	191	129	496
June	164	244	168	576	263	288	207	758
July	143	244	148	535	281	305	193	779
August	170	257	181	608	330	362	193	885
September	203	294	163	660	283	329	189	801
October	169	260	123	552	313	298	226	837
November	124	194	1 1	429	223	263	125	611
December	11	159	74	345	206	193	115	514
January	120	157	96	373	176	168	96	440
February	97	123	47	267	170	159	91	420
March	130	142	100	372	223	150	88	461
Totals	1,737	2,494	1,517	5,748	2,807	2,881	1,755	7,443

TABLE 12

Comparative Statement—Total Immigration to Canada, by Months, for the Fiscal Year 1940-41, Compared with that of the Preceding Fiscal Year

—	1939-40				1940-41			
	M.	F.	C.	Totals	M.	F.	C.	Totals
April	640	779	705	2,124	307	313	180	800
May	674	870	709	2,253	318	355	239	912
June	667	861	738	2,266	381	434	316	1,131
July	518	759	702	1,979	442	608	435	1,485
August	533	764	644	1,941	463	547	332	1,342
September	451	619	391	1,461	385	441	250	1,076
October	318	479	239	1,036	457	447	321	1,225
November	230	346	187	763	326	380	187	893
December	188	281	152	621	277	257	165	699
January	188	223	132	543	258	251	147	656
February	169	226	120	515	259	225	136	620
March	226	286	191	703	325	220	112	657
Totals	4,802	6,493	4,910	16,205	4,198	4,478	2,820	11,496

TABLE

Immigration via Ocean Ports, Showing Country of

Country of Birth	Totals	Bohemian	Moravian	Slovakian	Hebrew	English	Irish	Scotch	Welsh	Spanish American	Croatian	Serbian	Belgian	Bulgarian	Czech	Finnish	French	German
Africa (British)	20					12	1	6										
Africa (Not British)	1					1												
Argentina	13					8		3									1	
Atlantic Ocean Is. (British)	6					4	2											
Australia	49					39	7	2	1									
Atlantic Ocean Is. (Not British)	10					3	1	3										
Austria	32		1		15	1									4			11
Barbados	6						1	1										
Bahamas	2							1										
Belgium	52				8	13							30				1	
Bermuda	17					13	1	1										
Born at Sea	1																	
Brazil	4					3		1										
Bulgaria	2													1				
Canada	9					6											3	
Central America	5					4												1
Chile	6					2		2										2
China	77					53	6	11	2								4	
Cuba	4								1									
Czecho-Slovakia	88	2	1	1	43										39			1
Denmark	16																	
Dutch East Indies	1					1												
Egypt	6					2												
Eire	37					3	32	2										
England	1,133				31	1,002	22	47	11								3	1
Ecuador	1																	
Fiji Islands	1					1												
Finland	3															2		
France	77				3	20											53	
Germany	99			1	75	1									3			16
Gibraltar	2					2												
Greece	25																	
Guiana (British)	6					2		4										
Hawaiian Islands	2					1	1											
Holland	30				4	1												
Honduras (British)	3					2				1								
Hong Kong	15					14		1										
Hungary	45	1			14										1			
India (British)	52				1	30	6	9										
Ireland (Northern)	33					3	27	3										
Italy	42					1												
Jamaica	41				2	9	1	3		1								1
Japan	116					53	2	13	1									2
Java	3					3												
Jugo-Slavia	29			3	3						7	7			1			1
Korea	5					5												
Latvia	7				4													
Lesser British Isles	13					11		2										
Lithuania	17				14													
Malta (British)	1						1											
Mexico	17					1	1	1	3								1	
Newfoundland	1,150				1	937	109	51	5								37	
New Zealand	36					24	2	9	1									
Norway	17					2												
Palestine	4				2	1									1			
Paraguay	1																	1
Peru	19					9	2	6										
Philippine Islands	2																1	
Poland	55				33													
Portugal	7					5		1										
Roumania	13				10													
Russia	14				6													
St. Pierre and Miquelon	10																10	
Scotland	226					12	4	209									1	
South America	5					4											1	
Spain	13					3											3	
Straits Settlements	6					4		2										
Sumatra	3					3												
Sweden	14				1	11												
Switzerland	27				7	4											3	1
Syria	4							3										
Trinidad	9				1	3		2									1	
Turkey	11				4	2			1									
United States	52				1	36	2	3	1								4	1
Venezuela	1					1												
Wales	46					12	3	1	28								1	
West Indies (British)	21					5	1	2									1	
West Indies (Not British)	5				1			1										
Totals	4,053	3	2	5	284	2,408	235	406	55	2	7	7	30	1	49	2	129	39

13

Birth by Racial Origin, for the Fiscal Year 1940–41

Greek	Dutch	Magyar	Italian	Jugo-Slavian	Polish	Roumanian	Russian	Danish	Norwegian	Swedish	Swiss	Ruthenian	Esthonian	Lettish	Lithuanian	Portuguese	Spanish	Negro	Armenian	East Indian	Japanese	Syrian
																1						
																	1					
	2		1															4				
																		1				
	1									1												
	1																					
																		1				
	1																					
	1																1	1				
		1							16													
																	4					
	2		1		3		2	1	4	1					1		1	1				
																	1					
										1												
	1		1												2							
24		1																				
	25																					
		29																				
																				6		
			40			1											2	22				
													1								44	
		4		1		2																
							2							1								
															3							
	10					1		4	2	1						1	1					
									15													
																	2					
	1				20							2				1						
						2		5	1			1										
					2												7					
										2												
											12											1
2																1		1		2		
	4																					
	1																					
	1																	12				
																		2				
26	51	35	43	1	25	6	9	22	21	6	12	3	1	1	6	4	19	45	2	6	44	1

TABLE

Immigration from the United States, Showing Country

Country of Birth	Totals	Bohemian	Slovakian	Hebrew	English	Irish	Scotch	Welsh	N.A. Indian	Spanish American	Croatian	Serbian	Belgian	Bulgarian	Czech	Finnish	French	German
Africa (British)	14			3	5	1	3											
Africa (not British)	1						1											
Argentina	3			1	1		1											
Atlantic Ocean Is. (Br.)	1						1											
Australia	20				14	1	4	1										
Austria	8	2		2														2
Barbados	1				1													
Bahamas	1				1													
Belgium	6			1									4				1	
Bermuda	4				4													
Canada	511			10	191	68	90		2			1				1	111	11
Central America	2					1												
China	10				4		3											
Cuba	2				1													
Czecho-Slovakia	12	1	4	3											4			
Denmark	11																	
Egypt	3																	
Eire	57				3	53	1											
England	746			18	669	12	25	11							1		3	1
Fiji Islands	1						1											
Finland	11															10		
France	30			1	4	1											22	1
Germany	29			6														18
Greece	5																	
Guiana (British)	1																	
Hawaiian Islands	4				2													
Holland	8																	
Honduras (British)	1																	
Hong Kong	3				3													
Hungary	12		1	6														
Iceland	2																	
India (British)	16				11	2	1	1										
Ireland (Northern)	41				2	38	1											
Italy	13														1			
Jamaica	6				2													
Japan	1																	
Jugo-Slavia	6		1		1						1							1
Latvia	6			2														
Lesser British Isles	3				1												2	
Lithuania	2			1														
Malta	3					1												
Mexico	3				1					2								
Newfoundland	30				21	4	2										3	
New Zealand	15				9	2	3											
Norway	17				1													
Palestine	1			1														
Philippine Islands	3				1		1											1
Poland	47			32														3
Portugal	1																	
Roumania	13			10														1
Russia	68			47	1		1											7
Scotland	287				6	13	267										1	
Siberia	1						1											
Spain	3				1													
Sweden	20																	
Switzerland	4																	
Syria	4			1														
Trinidad	1				1													
Turkey	3				1													
United States	5,267	9	17	195	1,867	755	604	59	14		5	4	16	1	12	19	706	309
Wales	27			2	4	1	1	19										
West Indies (British)	9				7													1
West Indies (not British)	2						1											1
Totals	7,443	12	23	342	2,841	953	1,013	91	16	2	6	5	20	1	18	30	849	359

14

of Birth by Racial Origin, for the Fiscal Year 1940-41

Greek	Dutch	Magyar	Italian	Jugo-Slavian	Polish	Roumanian	Russian	Danish	Icelandic	Norwegian	Swedish	Swiss	Ruthenian	Lettish	Lithuanian	Maltese	Portuguese	Spanish	Negro	Armenian	Japanese	Syrian
																1		1				
													2									
1	9				1		1	1		2	3	2	1						3			
	1									1				1				1				
								11											1			
1																1						1
	1				2		1					2										
											1											
		1					2				1				1			1				
5																						
	2																	1				
	8																	1				
		5							2													
	1																					
			12															1	3		1	
				2			1							3								
					1											2						
	1									16												
					11								1				1					
		1			1	1	10								1							
											20							2				
												4										3
13	164	14	73	4	84	3	16	51	2	60	92	34	15	2	6	....	1	5	23	2 1	....	12
																		1				
20	187	21	85	6	100	4	31	63	4	79	117	42	19	6	8	4	2	14	30	3	1	16

TABLE

Total Immigration to Canada, Showing Country of

Country of Birth	Totals	Bohemian	Moravian	Slovakian	Hebrew	English	Irish	Scotch	Welsh	Spanish American	Croatian	Serbian	Belgian	Bulgarian	Czech	Finnish	French	German
Africa (British)	34				3	17	2	9										
Africa (Not British)	2					1		1										
Argentina	16				1	9		4									1	
Atlantic Ocean Is. (Br.)	7					4	2	1										
Atlantic Ocean Is. (Not Br.)	10					3	1	3										
Australia	69					53	8	6	2									
Austria	40	2	1		17	1									4			13
Barbados	7					1	1	1										
Bahamas	3					1		1										
Belgium	58				9	13							34				2	
Bermuda	21					17	1	1										
Born at Sea	1																	
Brazil	4					3		1										
Bulgaria	2													1				
Canada	520				10	197	68	90				1				1	114	13
Central America	7					4	1											1
Chili	6					2		2										2
China	87					57	6	14	2								4	
Cuba	6					1			1									
Czecho-Slovakia	100	3	1	5	46										43			1
Denmark	27																	
Dutch East Indies	1					1												
Egypt	9					2												
Eire	94					6	85	3										
England	1,879				49	1,671	34	72	22						1		6	2
Ecuador	1																	
Fiji Islands	2					1		1										
Finland	14															12		
France	107				4	24	1										75	1
Germany	128			1	81	1									3			34
Gibraltar	2					2												
Greece	30																	
Guiana (British)	7					2		4										
Hawaiian Islands	6					3	1											
Holland	38				4	1												
Honduras	4					2				1								
Hong Kong	18					17		1										
Hungary	57	1		1	20										1			
Iceland	2																	
India (British)	68				1	41	8	10	1									
Ireland (Northern)	74					5	65	4										
Italy	55					1									1			
Jamaica	47				2	11	1	3		1								1
Japan	117					53	2	13	1									2
Java	3					3												
Jugo-Slavia	35			4	3	1					8	7			1			2
Korea	5					5												
Latvia	13				6													
Lesser British Isles	16					12		2									2	
Lithuania	19				15													
Malta	4						2											
Mexico	20					2	1	1	3	2							1	
Newfoundland	1,180				1	958	113	53	5								40	
New Zealand	51					33	4	12	1									
Norway	34					3												
Palestine	5				3	1									1			
Paraguay	1																	1
Peru	19					9	2	6			...							
Philippine Islands	5					1		1			...						1	1
Poland	102				65													3
Portugal	8					5		1										
Roumania	26				20													1
Russia	82				53	1		1										7
St. Pierre and Miquelon	10																10	
Scotland	513					18	17	476									2	
South America	5					4											1	
Siberia	1							1										
Spain	16					4											3	
Straits Settlements	6					4		2										
Sumatra	3					3												
Sweden	34				1	11												
Switzerland	31				7	4											3	1
Syria	8				1			3										
Trinidad	10				1	4		2									1	
Turkey	14				4	3			1									
United States	5,319	9		17	196	1,903	757	607	60		5	4	16	1	12	19	710	310
Venezuela	1					1												
Wales	73				2	16	4	2	47								1	
West Indies (British)	30					12	1	2									1	1
West Indies (Not British)	7				1			2										1
Totals	11,496	15	2	28	626	5,249	1,188	1,419	146	4	13	12	50	2	67	32	978	398

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Birth by Racial Origin for the Fiscal Year 1940-41

Greek	Dutch	Magyar	Italian	Jugo-Slavian	Polish	Roumanian	Russian	Danish	Icelandic	Norwegian	Swedish	Swiss	Ruthenian	Esthonian	Lettish	Lithuanian	Maltese	Portuguese	Spanish	Negro	Armenian	East Indian	Japanese	Syrian	N. A. Indian
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
1	9	...	...	...	1	...	1	1	...	2	3	2	1	...	1	...	...	...	...	3	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	2	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	...	...	...
...	...	1	...	...	...	...	...	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	4	...	...	...	...	1	...
...	3	...	1	...	5	...	3	1	...	4	1	2	...	...	...	1	...	...	...	1	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1	1	1	...	...	...	2	...	...	...	1	...	...	...	...	3	...	...	1	...	...	...	...	...	...
29	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
...	33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
...	...	34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	...	...
...	...	...	52	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	25	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	45	...	...
...	...	4	...	3	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...
...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...
...	1	...	...	...	...	1	...	4	...	2	1	...	...	...	...	...	...	1	1	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...
...	1	...	...	...	31	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...
...	...	1	...	...	3	3	15	1	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	16	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	4	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...
13	168	14	73	4	84	3	16	51	2	60	92	34	15	...	2	6	...	1	5	23	1	...	...	12	14
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	12	...	...	...	...	...
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...
46	238	56	128	7	125	10	40	85	4	100	123	54	22	1	7	14	4	6	33	75	5	6	45	17	16

TABLE 16

Immigration, via Ocean Ports, Showing Destination by Intended Occupation and Sex, for the Fiscal Year Ended March 31, 1941

Destination	Totals	Farming Class				Labouring Class				Mechanics				Trading and Clerical Classes				Mining Class				Female Domestics		Other Classes			
		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over	Under 18 Years	18 Years and Over		Under 18 Years	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			M.	F.	M.	F.
Nova Scotia	934	19	1	2	....	298	5	3	2	44	....	.....	....	12	3	.....	....	2	....	.....	....	237	51	121	73	30	31
New Brunswick	59	1	....	.....	....	5	....	.....	....	2	1	.....	....	5	3	1	1	.....	....	.....	....	7	.....	14	11	3	5
Prince Edward Island	4	.....	....	.....	....	1	....	.....	....	.....	.....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....	.....	1	.....	2	.....
Quebec	918	15	10	11	1	45	4	3	....	67	27	12	11	72	49	26	16	2	....	.....	....	51	1	125	202	80	88
Ontario	1.087	32	19	12	12	28	6	9	5	56	27	8	7	50	45	16	19	2	....	.....	....	66	3	110	279	145	131
Manitoba	126	6	4	6	3	1	....	.....	....	4	1	.....	....	2	2	.....	....	.....	....	.....	....	2	1	18	36	24	16
Saskatchewan	62	4	2	.....	5	.....	....	1	....	1	1	1	1	.....	....	.....	....	.....	....	.....	....	2	.....	7	20	11	6
Alberta	91	5	2	1	....	.....	....	1	....	1	1	.....	....	3	4	1	....	.....	....	.....	....	2	.....	5	42	10	13
British Columbia	771	14	8	4	2	7	2	1	1	18	14	4	1	33	40	17	18	1	1	.....	....	14	.....	132	270	94	75
Northwest Territories	1	.....	....	.....	....	.....	....	.....	....	.....	.....	.....	....	.....	.....	.....	....	.....	....	.....	....	.....	.....	.....	1	.....	.....
Totals	4,053	96	46	36	23	385	17	18	8	193	72	25	20	177	146	61	54	7	1	.....	....	381	56	533	934	399	365

TABLE 17

Immigration from the United States to Canada, Showing Destination by Intended Occupation and Sex, for the Fiscal Year Ended March 31, 1941

Destination	Totals	Farming Class				Labouring Class				Mechanics				Trading and Clerical Classes				Mining Class				Female Domestics		Other Classes			
		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over	Under 18 Years	18 Years and Over		Under 18 Years	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			M.	F.	M.	F.
Nova Scotia	298	10	5	.....	1	4	1	4	2	16	5	6	6	12	4	2	....	2	....	.....	....	9	.....	35	96	41	37
New Brunswick	411	30	6	6	2	23	3	1	....	14	3	2	1	17	8	3	1	.....	....	.....	....	15	1	35	116	64	60
Prince Edward Island	39	3	2	1	2	1	....	.....	....	.....	....	.....	....	1	2	1	....	.....	....	.....	....	1	.....	5	9	4	7
Quebec	1,672	31	6	3	3	52	10	7	5	129	33	10	15	106	42	8	9	1	....	.....	....	30	1	450	460	133	128
Ontario	3,371	86	21	16	8	82	12	7	4	294	91	23	35	207	116	18	22	3	1	.....	1	77	5	500	1,028	350	364
Manitoba	161	12	6	1	3	3	3	.....	....	10	1	1	....	9	7	.....	....	.....	....	.....	....	3	.....	25	52	12	13
Saskatchewan	179	43	9	3	1	.....	....	.....	4	5	....	2	....	2	1	.....	....	.....	....	.....	....	3	1	22	61	12	10
Alberta	330	51	24	6	14	2	....	.....	2	13	5	1	1	8	7	2	1	.....	....	.....	....	7	.....	27	102	23	34
British Columbia	971	44	23	14	7	24	7	2	3	59	23	7	9	41	34	6	2	9	1	.....	....	12	.....	247	273	64	60
Yukon Territory	8	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	1	....	.....	....	.....	.....	.....	3	3	1
Northwest Territories	3	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....	1	2	.....	.....
Totals	7,443	310	102	50	41	191	36	21	20	540	161	52	67	403	221	40	35	16	2	.....	1	157	8	1,347	2,202	706	

TABLE 18

Total Immigration, Showing Destination by Intended Occupation and Sex, for the Fiscal Year Ended March 31, 1941

Destination	Totals	Farming Class				Labouring Class				Mechanics				Trading and Clerical Classes				Mining Class				Female Domestics		Other Classes			
		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over	Under 18 Years	18 Years and Over		Under 18 Years	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			M.	F.	M.	F.
Nova Scotia	1,232	29	6	2	1	302	6	7	4	60	5	6	6	24	7	2	....	4	....	.....	....	246	51	156	169	71	68
New Brunswick	470	31	6	6	2	28	3	1	....	16	4	2	1	22	11	4	2	.....	....	.....	....	22	1	49	127	67	65
Prince Edward Island	43	3	2	1	2	2	....	.....	....	.....	....	.....	....	1	2	1	....	.....	....	.....	....	1	.....	6	9	6	7
Quebec	2,590	46	16	14	4	97	14	10	5	196	60	22	26	178	91	34	25	3	....	.....	....	81	2	575	662	213	216
Ontario	4,458	118	40	28	20	110	18	16	9	350	118	31	42	257	161	34	41	5	1	.....	1	143	8	610	1,307	495	495
Manitoba	287	18	10	7	6	4	3	.....	....	14	2	1	....	11	9	.....	....	.....	....	.....	....	5	1	43	88	36	29
Saskatchewan	241	47	11	3	6	.....	....	1	4	6	1	3	1	2	1	.....	....	.....	....	.....	....	5	1	29	81	23	16
Alberta	421	56	26	7	14	2	....	1	2	14	6	1	1	11	11	3	1	.....	....	.....	....	9	.....	32	144	33	47
British Columbia	1,742	58	31	18	9	31	9	3	4	77	37	11	10	74	74	23	20	10	2	.....	....	26	.....	379	543	158	135
Yukon Territory	8	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	1	....	.....	....	.....	.....	.....	3	3	1
Northwest Territories	4	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....	1	3	.....	.....
Totals	11,496	406	148	86	64	576	53	39	28	733	233	77	87	580	367	101	89	23	3	.....	1	538	64	1,880	3,136	1,195	1,079

TABLE 19

Immigration, Showing Nationality and Sex, for the Fiscal Year Ended March 31, 1941

Nationality	Via Ocean Ports					From the United States					Grand Totals
	Totals	18 Years and Over		Under 18 Years		Totals	18 Years and Over		Under 18 Years		
		M.	F.	M.	F.		M.	F.	M.	F.	
British	3,428	1,192	1,342	447	447	2,064	798	980	130	156	5,492
U.S.A. Citizens	43	16	14	6	7	5,295	1,968	1,863	736	728	5,338
Belgian	15	5	5	4	1	1	1	.....	.....	.....	16
Bulgarian	1	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Czecho-Slovakian	112	45	44	14	9	7	2	3	1	1	119
Danish	13	8	5	.....	.....	2	1	1	.....	.....	15
Dutch	36	15	13	6	2	5	2	3	.....	.....	41
Finnish	2	1	1	.....	.....	8	2	6	.....	.....	10
French	33	10	19	3	1	13	6	7	.....	.....	46
German	94	27	38	12	17	12	5	5	1	1	106
Greek	23	2	8	6	7	2	1	1	.....	.....	25
Hungarian	39	9	17	6	7	3	1	1	1	.....	42
Italian	37	4	19	9	5	.....	.....	.....	.....	.....	37
Japanese	18	.....	12	4	2	.....	.....	.....	.....	.....	18
Jugo-Slavian	25	1	13	6	5	.....	.....	.....	.....	.....	25
Latvian	4	1	1	.....	2	4	3	1	.....	.....	8
Letchenstein	2	1	1	.....	.....	.....	.....	.....	.....	.....	2
Lithuanian	16	6	5	4	1	1	1	.....	.....	.....	17
Mexican	3	1	1	1	.....	.....	.....	.....	.....	.....	3
Norwegian	12	10	1	1	.....	3	3	.....	.....	.....	15
Polish	44	19	13	5	7	11	6	5	.....	.....	55
Roumanian	9	2	4	2	1	3	2	1	.....	.....	12
Russian	.....	.....	.....	.....	.....	6	3	3	.....	.....	6
South American	4	.....	1	2	1	.....	.....	.....	.....	.....	4
Spanish	8	3	3	.....	2	1	1	.....	.....	.....	9
Swedish	2	1	1	.....	.....	1	1	.....	.....	.....	3
Swiss	28	11	14	1	2	1	.....	1	.....	.....	29
Turkish	2	1	1	.....	.....	.....	.....	.....	.....	.....	2
Totals	4,053	1,391	1,597	539	526	7,443	2,807	2,881	869	886	11,496

TABLE 20

Immigration from the United States, Showing State of Last Residence, by Intended Occupation and Sex for the Fiscal Year 1940-41

State of Last Residence	Farming Class				Labouring Class				Mechanics				Trading and Clerical Classes				Mining Class				Female Domestics		Other Classes			
	18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over		Under 18 Years		18 Years and Over	Under 18 Years	18 Years and Over		Under 18 Years	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			M.	F.	M.	F.
Alabama					1				2	1			1										1	5		
Alaska	1																1						1	1		
Arizona	2	2	1	2					1				1										1	3		1
Arkansas									1	2	1	1	2	1		2							3	3		1
California	35	13	4	3	12	4	1	3	67	23	8	7	33	23	2	2	2			1	9	1	170	186	51	51
Colorado	2								3	2				1							1		9	8		
Connecticut	4				2		1		9	3	1	2	7	3	3	2					3		31	37	9	13
Delaware													1	1	1	1					1			2	2	2
District of Columbia	1				1				2	1				2									12	11	5	1
Florida	2	1			2	2	1	1	2	1			8	2							2		17	27	15	9
Georgia					2	1			1				2	1	1								8	6		
Hawaii																								1		
Idaho	3			1	1				1												1		5	6		3
Illinois	9	3	3	1	9	1		1	28	5	2	1	32	12	3	2					3		28	81	20	26
Indiana	3				1	1	1	1	5	4	6	1	1	1									8	14	4	2
Iowa	6	3		2					2				2	2							1		6	19	4	7
Kansas	6	2	9	6	1	1	2		1												1		8	18	5	2
Kentucky		1			1				1				2	1		1							2	4	3	1
Louisiana					1	1			4	1													7	4		
Maine	22	4	2	1	22	2	1	1	11	3		1	18	8	1						7	1	28	98	45	48
Maryland	1								5	1			2										19	9	3	3
Massachusetts	22	6	4	1	13	3	1		49	17	6	3	27	17	6	3	1				16		118	206	78	65
Michigan	31	7	1	4	23	2	2		77	16	4	11	50	22	3	5	2				18	2	78	281	130	160
Minnesota	11	4	1	1	3			1	6	2	1		8	3	1		1				1		21	70	10	7
Mississippi																					1		5	1		
Missouri	2	2	2	1					4	2	1	1	1				1				2	1	8	21	4	
Montana	11	3	1	1	2			4	1				1	1	1	1					1		7	14	2	4
Nebraska	6	1												1							2		8	5	2	1

Nevada													1	1								2	3			
New Hampshire	6	1		1	3	1			6				5	1						4		15	36	12	15	
New Jersey	2	1			6	1			25	7	5	3	14	7	1					3		68	53	17	13	
New Mexico													1									3	2	3	3	
New York	29	9	4	2	49	9	8	7	128	39	7	15	105	54	10	11			1		48	2	346	450	139	152
North Carolina					1				3				1									14	9		2	
North Dakota	6	2	1	3	2				1	1	1		1	1						1		7	17	5	3	
Ohio	13	3			3	1			21	6		2	16	10	1	2				10		29	93	17	22	
Oklahoma													2							2		4	1		4	
Oregon	8	3	3	2					1				3	7	2						1	24	30	11	2	
Pennsylvania	6	3			7	1			26	9	3	8	20	12	4	2	1			6		50	87	22	15	
Rhode Island	2	1	1						7	2	3	2	4	1		1				2		21	32	5	9	
South Carolina									1													6	1	2		
South Dakota	2	1																				2	4	2	4	
Tennessee					1															1		3	6			
Texas	4	1	3	1					4	1		1	1	2								29	23	8	4	
Utah	1								2	1										1		2	7			
Vermont	5	2	1	2	10	1	1	1	6	2		2	2	1			1					10	34	15	7	
Virginia	4	2							1				2									5	10	3	2	
Washington	31	16	6	5	7	2	1		12	4	1	2	14	14			5	1		6		76	122	29	32	
West Virginia													1	1			1					4	3	1		
Wisconsin	4	1	1		2	1			5			1	5	5						1		8	14	10	9	
Wyoming	2	1	1	1	1	1			3	2	2	3										2	3	4	2	
Not given	5	3	1		2		1		5	3			6	2						2		10	21	9	7	
Totals	310	102	50	41	191	36	21	20	540	161	52	67	403	221	40	35	16	2	1	157	8	1,347	2,202	706	714	

TABLE

Origin, Sex, Occupation, and Destination of Immigrant Arrivals

Racial Origin	Sex				Totals	Trade or								
	18 Years and Over		Under 18 Years			Farming Class			Labouring Class			Mechanics		
	Males	Females	Males	Females		Males	Females	Children	Males	Females	Children	Males	Females	Children
Armenian	1	1			2				1					
Belgian	8	13	5	4	30	2	1				1	1		
Bohemian	2	1			3							1		
British—														
English	833	923	321	331	2,408	33	6	17	305	9	20	114	47	29
Irish	95	102	19	19	235	6	3	5	31	1		13	2	2
Scotch	141	162	52	51	406	7	1		11		4	32	9	4
Welsh	20	20	10	5	55				2		1	3		3
Bulgarian		1			1									
Croatian		3	2	2	7									
Czech	19	15	11	4	49	4	2	3	1	1		3	1	3
Dutch	14	15	12	10	51	4	4	5	1					
East Indian		4	2		6					1				
Esthonian		1			1									
Finnish		1		1	2									
French	37	49	23	20	129	2			10			3	4	
German	5	23	6	5	39	1	3	2				1	1	
Greek	3	10	6	7	26	1	1	4	1			1		
Hebrew	112	102	34	36	284	26	20	21	3	3		10	4	4
Italian	5	23	10	5	43				3			1	1	
Japanese		34	6	4	44		1	1		1				
Jugo-Slavian				1	1									
Lettish		1			1								1	
Lithuanian	2	3	1		6									
Magyar	4	18	6	7	35	1	1		1	1			2	
Moravian		2			2									
Negro	39	5		1	45				5					
Polish	10	10	4	1	25	1						1		
Portuguese	2	1		1	4							1		
Roumanian	1	3	2		6			1						
Russian	1	6	1	1	9							1		
Ruthenian	1	2			3	1								
Scandinavian—														
Danish	13	8		1	22	2	1		5			3		
Norwegian	12	5	2	2	21	3			3			2		
Swedish	2	3		1	6							1		
Serbian		4	1	2	7									
Slovak		4		1	5									
Spanish	6	7	3	3	19				2			1		
Spanish American		2			2									
Swiss	3	9			12	2	2							
Syrian		1			1									
Totals	1,391	1,597	539	526	4,053	96	46	59	385	17	26	193	72	45

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at Ocean Ports, for the Fiscal Year Ended March 31, 1941

Occupation											Destination										
Trading and Clerical Classes			Mining Class			Female Domestic Servants		Other Classes													
Males	Females	Children	Males	Females	Children	18 Years and Over	Under 18 Years	Males	Females	Children	Nova Scotia	New Brunswick	Prince Edward Island	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon Territory	Northwest Territories
									1					1					1		
1	2	3				1		4	9	5	1			18	4	4			3		
1									1					2	1						
76	85	60	4	1		281	47	301	493	479	735	38	4	430	598	54	33	55	461		
8	6	2	2			34	2	35	56	27	80	4		38	49	7	10	7	40		
20	8	6	1			33	1	70	111	88	52	6		82	130	13	8	11	103		1
5	1					3		10	16	11	4	1		9	21		1	2	17		
									1						1						
							1		3	3					7						
9	5	5						2	6	4				18	23				8		
3	1	2				1		6	9	15	3			15	16	10		1	6		
									3	2									6		
									1										1		
									1	1				1	1						
4	6	7				12	4	18	27	32	37			64	12	1	2	1	12		
	3					3		3	13	9				16	14	1			8		
									9	9	4			3	18				1		
40	20	23				2	1	33	53	21	2			135	97	31	5		14		
1									22	15	1			9	24				9		
	1								31	9									44		
										1									1		
																			1		
1	1							1	2	1				4	2						
1	1	2				1		1	12	11				3	17		1	7	7		
	1								1						1				1		
						1		34	4	1	2	8		26	8				1		
3	2	2						5	8	3				4	14	4			3		
								1	1	1	1			1	1			1			
								1	3	1	1			3			1		1		
									6	2				3	2				4		
	1					1								2	1						
1	1					5		2	1	1	4			7	6			1	4		
2		3				1		2	4	1	2	2		4		1	1	2	9		
						1		1	2	1	2			1	2				1		
									4	3					6				1		
									4	1					5						
								3	7	6	1			15	3						
									2		1				1						
1						1			6		1			3	2			3	3		
									1					1							
177	146	115	7	1		381	56	533	934	764	934	59	4	918	1,087	126	62	91	771		1

TABLE

Origin, Sex, Occupation, and Destination of Immigrant Arrivals

Racial Origin	Sex				Totals	Trade or								
	18 Years and Over		Under 18 Years			Farming Class			Labouring Class			Mechanics		
	Males	Females	Males	Females		Males	Females	Children	Males	Females	Children	Males	Females	Children
Armenian	1	2			3							1	1	
Belgian	7	7	3	3	20	2						1		
Bohemian	4	4	1	3	12	2	1	3				1		
British—														
English	1,128	1,033	354	326	2,841	108	34	24	79	12	18	222	68	41
Irish	354	362	111	126	953	29	9	11	18	4	2	70	19	10
Scotch	387	366	123	137	1,013	40	17	18	20	5	6	82	20	23
Welsh	51	20	8	12	91	3			1	1		9	3	4
Bulgarian		1			1									
Croatian	1	5			6	1								
Czech	9	5	3	1	18	1						1		
Dutch	68	82	22	15	187	9	5	1	3	1	1	14	3	2
Finnish	11	16	2	1	30	2	1		2	2	1	2	1	
French	266	344	118	121	849	42	8	9	27	4	5	48	18	22
German	111	191	19	38	359	23	9	3	5	1	2	19	3	4
Greek	10	8		2	20				1			1		
Hebrew	129	146	32	35	342	2	1	2	7	2	1	26	16	3
Italian	25	40	11	9	85	1	1	1	4	1	1	5	1	2
Japanese		1			1									
Jugo-Slavian	3	1	1	1	6				2					
Lettish	2	1	3		6	1	1							
Lithuanian	2	4	1	1	8	2								
Magyar	9	10	1	1	21	2	1		1	1		2		
Maltese	2	2			4									
Negro	14	12	4		30				5			3		
North American Indian	3	6	5	2	16				1					
Polish	46	44	2	8	100	2	1		3			9	1	2
Portuguese	1	1			2								1	
Roumanian	3	1			4	1						2		
Russian	10	15	2	4	31	4	1					1		
Ruthenian	5	7	5	2	19	1	1							
Scandinavian—														
Danish	19	22	7	15	63	8	3	4	1	1				
Icelandic	1	2		1	4					1				
Norwegian	35	37	5	2	79	16	6	2	2			4		1
Swedish	52	52	7	6	117	3	2		4		2	8	5	3
Serbian	3	2			5							1		
Slovak	9	7	1	6	23				2			2		
Spanish	10	4			14				1			3	1	
Spanish American		1	1		2									
Swiss	12	9	14	7	42	5		13	1		2	3		
Syrian	4	8	3	1	16				1					
Totals	2,807	2,881	869	886	7,443	310	102	91	191	36	41	540	161	119

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from the United States, for the Fiscal Year Ended March 31, 1941

Occupation											Destination										
Trading and Clerical Classes			Mining Class			Female Domestic Servants		Other Classes			Nova Scotia	New Brunswick	Prince Edward Island	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon Territory	Northwest Territories
Males	Females	Children	Males	Females	Children	18 Years and Over	Under 18 Years	Males	Females	Children											
									1						3						
1								3	7	6				2	14		1		3		
1	1	1							2						3		2	1	6		
155	93	38	6	2	1	51	6	558	773	552	147	194	11	448	1,381	54	60	117	422	6	1
42	24	5	2			20	1	193	286	208	28	68	3	177	473	21	18	44	121		
51	27	6				42		194	255	207	68	51	12	150	470	25	17	47	173		
8		3						30	16	13	4	1		20	36	2		11	17		
									1						1						
	1								4					1	5						
1	1							6	4	4		1		5	6		1	2	3		
10	4	3				4		32	65	30	8	6	6	20	96	3	8	19	21		
						1		5	11	2	1	2		1	17	2	1	3	3		
42	19	5	1			18	1	106	277	197	14	63	4	511	196	9	4	11	37		
15	13	2	1			7		48	158	46	6	6	1	55	173	20	18	28	50	1	1
4	3					1		4	4	2		2		4	12				2		
51	16	8				3		43	108	53	15	1		158	144	7		6	11		
4	3	1	1			1		10	33	15	3	3		19	53				7		
									1									1			
								1	1	2					3		1		2		
								1		3					4	2					
									4	2				3	4				1		
						1		4	7	2				2	19						
1								1	2					2	2						
						1		6	11	4	1			4	22				3		
	1					1		2	4	7		1		6	6		1		2		
3	5					1		29	36	8	1			26	56	2	2	2	11		
1														2							
									1						3		1				
	1							5	13	6				13	6	4	2	2	4		
								4	6	7					7	1	6	4	1		
2	3	1	1			1		7	14	17		7		7	13		2	14	19		1
						1		1		1						1	1		2		
2	3		1					10	28	4				3	24	2	26	8	16		
5	1	1	2			3		30	41	7	1	2	2	15	52	5	7	7	25	1	
1	1							1	1		1			1	3						
			1					4	7	7				4	18				1		
1								5	3					4	7	1			2		
									1	1				2							
	1	1						3	8	3				2	31			3	6		
2								1	8	4		3		5	8						
403	221	75	16	2	1	157	8	1,347	2,202	1,420	298	411	39	1,672	3,371	161	179	330	971	8	3

TABLE

Origin, Sex, Occupation, and Destination of Total Immigrant

Racial Origin	Sex				Totals	Trade or								
	18 Years and Over		Under 18 Years			Farming Class			Labouring Class			Mechanic		
	Males	Females	Males	Females		Males	Females	Children	Males	Females	Children	Males	Females	Children
Armenian	2	3			5				1			1	1	
Belgian	15	20	8	7	50	4	1				1	2		
Bohemian	6	5	1	3	15	2	1	3				2		
British—														
English	1,961	1,956	675	657	5,249	141	40	41	384	21	38	336	115	70
Irish	449	464	130	145	1,188	35	12	16	49	5	2	83	21	12
Scotch	528	528	175	188	1,419	47	18	18	31	5	10	114	29	27
Welsh	71	40	18	17	146	3			3	1	1	12	3	7
Bulgarian		2			2									
Croatian	1	8	2	2	13	1								
Czech	28	20	14	5	67	5	2	3	1	1		4	1	3
Dutch	82	97	34	25	238	13	9	6	4	1	1	14	3	2
East Indian		4	2		6					1				
Esthonian		1			1									
Finnish	11	17	2	2	32	2	1		2	2	1	2	1	
French	303	393	141	141	978	44	8	9	37	4	5	51	22	22
German	116	214	25	43	398	24	12	5	5	1	2	20	4	4
Greek	13	18	6	9	46	1	1	4	2			2		
Hebrew	241	248	66	71	626	28	21	23	10	5	1	36	20	7
Italian	30	63	21	14	128	1	1	1	7	1	1	6	2	2
Japanese		35	6	4	45		1	1		1				
Jugo-Slavian	3	1	1	2	7				2					
Lettish	2	2	3		7	1	1						1	
Lithuanian	4	7	2	1	14	2								
Magyar	13	28	7	8	56	3	2		2	2		2	2	
Maltese	2	2			4									
Moravian		2			2									
Negro	53	17	4	1	75				10			3		
North American Indian	3	6	5	2	16				1					
Polish	56	54	6	9	125	3	1		3			10	1	2
Portuguese	3	2		1	6							1	1	
Roumanian	4	4	2		10	1		1				2		
Russian	11	21	3	5	40	4	1					2		
Ruthenian	6	9	5	2	22	2	1							
Scandinavian—														
Danish	32	30	7	16	85	10	4	4	6	1		3		
Icelandic	1	2		1	4					1				
Norwegian	47	42	7	4	100	19	6	2	5			6		1
Swedish	54	55	7	7	123	3	2		4		2	9	5	3
Serbian	3	6	1	2	12							1		
Slovak	9	11	1	7	28				2			2		
Spanish	16	11	3	3	33				3			4	1	
Spanish American		3	1		4									
Swiss	15	18	14	7	54	7	2	13	1		2	3		2
Syrian	4	9	3	1	17				1					
Totals	4,198	4,478	1,408	1,412	11,496	406	148	150	576	53	67	733	233	16

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Arrivals, for the Fiscal Year Ended March 31, 1941

Occupation										Destination										
Trading and Clerical Classes			Mining Class			Female Domestic Servants		Other Classes												
Males	Females	Children	Males	Females	Children	18 Years and Over	Under 18 Years	Males	Females	Children	Nova Scotia	New Brunswick	Prince Edward Island	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon Territory	Northwest Territories
.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	1	3	.....	.....	.....	1	.....	.....
2	2	3	.....	.....	.....	1	.....	7	16	11	1	.....	.....	20	18	4	1	.....	6	.....	.....
2	1	1	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	2	4	.....	2	1	6	.....	.....
231	179	98	10	3	1	332	53	859	1,266	1,031	882	232	15	878	1,979	108	93	172	883	6	1
50	30	7	4	.....	.....	54	3	228	342	235	108	72	3	215	522	28	28	51	161	.....	.....
71	35	12	1	.....	.....	75	1	264	366	295	120	57	12	232	600	38	25	58	276	.....	1
13	1	3	.....	.....	.....	3	.....	40	32	24	8	2	.....	29	57	2	1	13	34	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
.....	1	.....	.....	.....	.....	.....	1	.....	7	3	.....	.....	.....	1	12	.....	.....	.....	.....	.....	.....
10	6	5	.....	.....	.....	.....	.....	8	10	8	.....	1	.....	23	29	.....	1	2	11	.....	.....
13	5	5	.....	.....	.....	5	.....	38	74	45	11	6	6	35	112	13	8	20	27	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	3	2	.....	.....	.....	.....	.....	.....	.....	.....	6	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
.....	.....	.....	.....	.....	.....	1	.....	5	12	3	1	2	.....	2	18	2	1	3	3	.....	.....
46	25	12	1	.....	.....	30	5	124	304	229	51	63	4	575	208	10	6	12	49	.....	.....
15	16	2	1	.....	.....	10	.....	51	171	55	6	6	1	71	187	21	18	28	58	1	1
4	3	.....	.....	.....	.....	1	.....	4	13	11	4	2	.....	7	30	.....	.....	.....	3	.....	.....
91	36	31	.....	.....	.....	5	1	76	161	74	17	1	.....	293	241	38	5	6	25	.....	.....
5	3	1	1	.....	.....	1	.....	10	55	30	4	3	.....	28	77	.....	.....	.....	16	.....	.....
.....	1	.....	.....	.....	.....	.....	.....	.....	32	9	.....	.....	.....	.....	.....	.....	.....	1	44	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	1	1	3	.....	.....	.....	.....	3	.....	1	.....	3	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	1	.....	3	.....	.....	.....	.....	4	2	.....	.....	1	.....	.....
1	1	.....	.....	.....	.....	.....	.....	1	6	3	.....	.....	.....	7	6	.....	.....	.....	1	.....	.....
1	1	2	.....	.....	.....	2	.....	5	19	13	.....	.....	.....	5	36	.....	1	7	7	.....	.....
1	.....	.....	.....	.....	.....	.....	.....	1	2	.....	.....	.....	.....	2	2	.....	.....	.....	.....	.....	.....
.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....
.....	.....	.....	.....	.....	.....	2	.....	40	15	5	3	8	.....	30	30	.....	.....	.....	4	.....	.....
.....	1	.....	.....	.....	.....	1	.....	2	4	7	.....	1	.....	6	6	.....	1	.....	2	.....	.....
6	7	2	.....	.....	.....	1	.....	34	44	11	1	.....	.....	30	70	6	2	2	14	.....	.....
1	.....	.....	.....	.....	.....	.....	.....	1	1	1	1	.....	.....	3	1	.....	.....	1	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	1	4	1	1	.....	.....	3	3	.....	2	.....	1	.....	.....
.....	1	.....	.....	.....	.....	.....	.....	5	19	8	.....	.....	.....	16	8	4	2	2	8	.....	.....
.....	1	.....	.....	.....	.....	1	.....	4	6	7	.....	.....	.....	2	8	1	6	4	1	.....	.....
3	4	1	1	.....	.....	6	.....	9	15	18	4	7	.....	14	19	.....	2	15	23	.....	1
.....	.....	.....	.....	.....	.....	1	.....	1	.....	1	.....	.....	.....	.....	.....	1	1	.....	2	.....	.....
4	3	3	1	.....	.....	1	.....	12	32	5	2	2	.....	7	24	3	27	10	25	.....	.....
5	1	1	2	.....	.....	4	.....	31	43	8	3	2	2	16	54	5	7	7	26	1	.....
1	1	.....	.....	.....	.....	.....	.....	1	5	3	1	.....	.....	1	9	.....	.....	.....	1	.....	.....
.....	.....	.....	1	.....	.....	.....	.....	4	11	8	.....	.....	.....	4	23	.....	.....	.....	1	.....	.....
1	.....	.....	.....	.....	.....	.....	.....	8	10	6	1	.....	.....	19	10	1	.....	.....	2	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	3	1	1	.....	.....	2	1	.....	.....	.....	.....	.....	.....
1	1	1	.....	.....	.....	1	.....	3	14	3	1	.....	.....	5	33	.....	.....	6	9	.....	.....
2	.....	.....	.....	.....	.....	.....	.....	1	9	4	.....	3	.....	6	8	.....	.....	.....	.....	.....	.....
580	367	190	23	3	1	538	64	1,880	3,136	2,184	1,232	470	43	2,590	4,458	287	241	421	1,742	8	4

TABLE

Immigration via Ocean Ports, Showing Racial Origin

Racial Origin	Totals	British	U.S.A. citizens	Belgian	Bulgarian	Czecho-Slovakian	Danish	Dutch	Finnish	French	German	Greek
Armenian	2											
Belgian	30	16		14								
Bohemian	3					3						
British—												
English	2,408	2,379	23	1				1		3		
Irish	235	233	2									
Scotch	406	402	4									
Welsh	55	55										
Bulgarian	1				1							
Croatian	7											
Czech	49	2				47						
Dutch	51	19	4					28				
East Indian	6	6										
Esthonian	1	1										
Finnish	2	1							1			
French	129	89	5							27		
German	39	14	1			3					16	
Greek	26	4										22
Hebrew	284	60	2			53		7			77	
Italian	43	6										
Japanese	44	26										
Jugo-Slavian	1	1										
Lettish	1	1										
Lithuanian	6	4										
Magyar	35	1				3						1
Moravian	2					1					1	
Negro	45	43	2									
Polish	25	8								3		
Portuguese	4	4										
Roumanian	6	4										
Russian	9	9										
Ruthenian	3	2										
Scandinavian—												
Danish	22	9					13					
Norwegian	21	9										
Swedish	6	4							1			
Serbian	7	1										
Slovak	5					2						
Spanish	19	9										
Spanish-American	2	2										
Swiss	12	3										
Syrian	1	1										
Totals	4,053	3,428	43	15	1	112	13	36	2	33	94	23

24

by Nationality, for the Fiscal Year 1940-41

Hungarian	Italian	Japanese	Jugo-Slavian	Latvian	Lichtenstein	Lithuanian	Mexican	Norwegian	Polish	Roumanian	Spanish	South American	Swedish	Swiss	Turkish
															2
													1		
			7												
							3					1		4	
			1			1						1		2	
11			4	4	1	14			30	8				13	
	37														
		18													
						2									
28			2												
									14						
			2												
										1					
								12							
													1		
			6												
			3												
											8	2			
														9	
39	37	18	25	4	2	16	3	12	44	9	8	4	2	28	2

TABLE 25

Immigration, from the United States, Showing Racial Origin by Nationality, for the Fiscal Year 1940-41

Racial Origin	Totals	British	U.S.A. Citizens	Belgian	Czecho-Slovakian	Danish	Dutch	Finnish	French	German	Greek	Hungarian	Latvian	Lithuanian	Norwegian	Polish	Roumanian	Russian	Spanish	Swedish	Swiss
Armenian	3	2	1																		
Belgian	20	3	16	1																	
Bohemian	12		9		3																
British—																					
English	2,841	951	1,888						1								1				
Irish	953	224	727			1		1													
Scotch	1,013	402	611																		
Welsh	91	34	57																		
Bulgarian	1		1																		
Croatian	6	2	4																		
Czech	18	2	13		3																
Dutch	187	27	155				5														
Finnish	30	8	15					7													
French	849	84	753						12												
German	359	83	273							2							1				
Greek	20	6	12								2										
Hebrew	342	84	236		1					7		2	1	1		6	1	3			
Italian	85	19	66																		
Japanese	1	1																			
Jugo-Slavian	6	2	4																		
Lettish	6		3										3								
Lithuanian	8	2	6																		
Magyar	21	9	11									1									
Maltese	4	2	2																		
Negro	30	9	21																		
North American Indian	16	2	14																		
Polish	100	18	78													4					
Portuguese	2		2																		
Roumanian	4	1	3																		
Russian	31	9	16							3								3			
Ruthenian	19	8	10													1					
Scandinavian—																					
Danish	63	8	54			1															
Icelandic	4	2	2																		
Norwegian	79	17	59												3						
Swedish	117	19	97																	1	
Serbian	5		5																		
Slovak	23	6	17																		
Spanish	14	7	6																1		
Spanish-American	2	2																			
Swiss	42	4	37																		1
Syrian	16	5	11																		
Totals	7,443	2,064	5,295	1	7	2	5	8	13	12	2	3	4	1	3	11	3	6	1	1	1

TABLE 26

Immigration via Ocean Ports, Showing Conjugal Condition by Age Groups and Sex, for the Fiscal Year 1940-41

Age Groups	Males					Females				
	Married	Single	Widowed	Divorced	Totals	Married	Single	Widowed	Divorced	Totals
Years 0-14	.....	470	.....	.....	470	.....	403	.....	.....	403
" 15-19	1	134	.....	.....	135	16	251	1	.....	268
" 20-24	25	228	.....	.....	253	103	212	2	.....	317
" 25-29	73	193	1	.....	267	116	98	.....	.....	214
" 30-39	234	87	3	3	327	240	86	14	10	350
" 40-49	201	24	7	1	233	175	39	33	2	249
50 years and over	182	24	34	5	245	146	49	124	3	322
Totals	716	1,160	45	9	1,930	796	1,138	174	15	2,123

TABLE 27

Immigration from the United States, Showing Conjugal Condition by Age Groups and Sex, for the Fiscal Year 1940-41

Age Groups	Males					Females				
	Married	Single	Widowed	Divorced	Totals	Married	Single	Widowed	Divorced	Totals
Yaers 0-14	.....	744	.....	.....	744	.....	755	.....	.....	755
" 15-19	1	252	.....	1	254	72	193	.....	.....	265
" 20-24	54	429	1	7	491	311	152	.....	2	465
" 25-29	158	279	.....	7	444	342	97	5	5	449
" 30-39	444	229	5	35	713	544	119	17	31	711
" 40-49	363	117	13	27	520	390	63	38	22	513
50 years and over	356	69	71	14	510	279	105	205	20	609
Totals	1,376	2,119	90	91	3,676	1,938	1,484	265	80	3,767

TABLE 28

Immigration via Ocean Ports, Showing Origin and Person to whom Destined, for the Fiscal Year 1940-41

Racial Origin	Totals	Husband	Parent	Brother	Sister	Fiancee	Friend	Relative	Employer	Others
Armenian	2	1		1						
Belgian	30	2	5		1	1		16	2	3
Bohemian	3								1	2
British—										
English	2,408	123	187	88	110	37	262	702	293	606
Irish	235	11	14	7	13	6	42	51	31	60
Scotch	406	16	30	17	23	14	24	146	34	102
Welsh	55	3	2	2	3	1	9	10	6	19
Bulgarian	1					1				
Croatian	7	3	4							
Czech	49	1	4	3	1	1	8	11	3	17
Dutch	51	1	5		3	2	7	4	2	27
East Indian	6	3	2							1
Esthonian	1									1
Finnish	2	1								1
French	129	5	16	5	3		6	44	18	32
German	39	4	5			1	11	6	1	11
Greek	26	3	9	1	1	2	1	7		2
Hebrew	284	8	22	14	3		42	66	8	121
Italian	43	18	17	1		2		1	1	3
Japanese	44	26	7				4	3		4
Jugo-Slavian	1	1								
Lettish	1									1
Lithuanian	6	2						2		2
Magyar	35	7	11	1		2	6	4		4
Moravian	2							1		1
Negro	45	3	1		1	1	1	1	3	34
Polish	25	2	2		1		7	4	4	5
Portuguese	4	1						1		2
Roumanian	6	1	3				1			1
Russian	9	2	1				2			4
Ruthenian	3						1	1		1
Scandinavian—										
Danish	22		1		2		4	4	1	10
Norwegian	21	2				2	2	8	2	5
Swedish	6	1	1					1	2	1
Serbian	7	3	3				1			
Slovak	5	2	1			2				
Spanish	19	3	6				1	4	1	4
Spanish-American	2	1						1		
Swiss	12	1		1	1	1		2		6
Syrian	1	1								
Totals	4,053	262	359	141	166	76	442	1,101	413	1,093

TABLE 29

Immigration from the United States, Showing Origin and Person to whom Destined, for the Fiscal Year 1940-41

Racial Origin	Totals	Husband	Parent	Brother	Sister	Fiancee	Friend	Relative	Employer	Others
Armenian	3				1		1			1
Belgian	20	1	1			1	1	3	3	10
Bohemian	12	1	1	1		1	3	4		1
British—										
English	2,841	378	522	60	75	54	167	447	192	946
Irish	953	162	173	8	21	17	32	161	62	317
Scotch	1,013	125	196	27	39	17	60	161	53	335
Welsh	91	8	12	1	2	1	3	9	5	50
Bulgarian	1	1								
Croatian	6	3				1		1		1
Czech	18	1	3			2			3	9
Dutch	187	36	25	1	2	7	4	24	13	75
Finnish	30	11	2				7	3	1	6
French	849	129	212	13	20	22	17	102	47	287
German	359	98	41	4	7	18	7	62	24	98
Greek	20	4	2				1		1	12
Hebrew	342	67	71	6	8	14	16	61	19	80
Italian	85	25	17	2		3	5	9	2	22
Japanese	1									1
Jugo-Slavian	6	1	1					1		3
Lettish	6		1							5
Lithuanian	8	2	2				1			3
Magyar	21	7	4					7		3
Maltese	4			2				2		
Negro	30	7	5			4	2	1	3	8
North American Indian	16	4	4	1			1	1	1	4
Polish	100	20	9	1		4	5	7	17	37
Portuguese	2								2	
Roumanian	4	1	1	1						1
Russian	31	8	6	2		1	2	2	3	7
Ruthenian	19	4	3				2	6		4
Scandinavian—										
Danish	63	8	21	2	1	3	1	4	4	19
Icelandic	4		2					2		
Norwegian	79	19	13	5		4	6	8	2	22
Swedish	117	27	6	3	2	2	3	15	12	47
Serbian	5					1			1	3
Slovak	23	6	7			1	3	1	1	4
Spanish	14	2	2				1	2	1	6
Spanish-American	2	1	1							
Swiss	42	4	8	1	2		3	12	3	9
Syrian	16	7	4					3	1	1
Totals	7,443	1,178	1,378	141	180	178	354	1,121	476	2,437

TABLE 30

Admissions and Rejections, by Divisions, for the Fiscal Year 1940-41

	Ocean Ports		International Boundary Ports		Ocean Ports and International Boundary Ports	
	Admissions	Rejections	Admissions	Rejections	Admissions	Rejections
Atlantic Division—						
Quebec	950	19				
North Sydney	956	47				
Halifax	487	53				
Saint John	198	8				
Montreal	95	51				
Louisburg	50					
Sydney	8	4				
Port Alfred	3					
Chatham		1				
Dalhousie	2					
Pictou		1				
Windsor	1					
New York	571	29				
Boston	13	1				
Philadelphia	4	2				
International Boundary Ports			2,472	2,077		
Totals	3,338	216	2,472	2,077	5,810	2,293
Eastern Division— International Boundary Ports			3,297	8,512	3,297	8,512
Western Division— International Boundary Ports			676	586	676	586
Pacific Division—						
Vancouver	413	11				
Victoria	124					
New Westminster	8					
Port Alberni	1					
International Boundary Ports			998	646		
Totals	546	11	998	646	1,544	657
Other Ocean Ports	169	9			169	9
Grand Totals	4,053	236	7,443	11,821	11,496	12,057

TABLE 31

Rejections, at Ocean Ports, by Causes and Nationalities, from 1902-3 to 1940-41

—	Fiscal Years																				
	1902-3 to 1912-3	1913-4 to 1922-3	1923-1924	1924-1925	1925-1926	1926-1927	1927-1928	1928-1929	1929-1930	1930-1931	1931-1932	1932-1933	1933-1934	1934-1935	1935-1936	1936-1937	1937-1938	1938-1939	1939-1940	1940-1941	Totals
By Causes																					
Medical causes	4,162	1,029	130	83	40	95	104	94	78	39	26	16	17	9	13	11	8	7	10	11	5,982
Civil causes	5,094	5,604	862	948	226	594	215	266	243	444	298	213	177	206	183	236	202	170	167	225	16,573
Totals	9,256	6,633	992	1,031	266	689	319	360	321	483	324	229	194	215	196	247	210	177	177	236	22,555
By Nationalities																					
British	1,240	978	187	199	109	209	150	154	160	251	180	126	123	150	123	138	86	94	124	95	4,876
American	175	134	6	11	.....	5	2	3	8	6	4	13	11	13	7	7	4	9	5	4	427
Other countries	7,841	5,521	799	821	157	475	167	203	153	226	140	90	60	52	66	102	120	74	48	137	17,252
Totals	9,256	6,633	992	1,031	266	689	319	360	321	483	324	229	194	215	196	247	210	177	177	236	22,555

TABLE 32

Deportations, After Having Been Admitted, by Causes, Nationalities, and Provinces, from 1902-3 to 1940-41

—	Fiscal Years																			
	1902–3 to 1912–3	1913–4 to 1922–3	1923–1924	1924–1925	1925–1926	1926–1927	1927–1928	1928–1929	1929–1930	1930–1931	1931–1932	1932–1933	1933–1934	1934–1935	1935–1936	1936–1937	1937–1938	1938–1939	1939–1940	1940–1941	Totals
By Causes																				
Medical causes	2,296	2,213	649	420	410	470	519	650	600	789	697	476	301	144	81	47	42	36	29	12	10,881
Public charges	2,853	4,517	775	543	506	354	430	444	2,106	2,245	4,507	4,916	2,991	464	125	110	46	45	18	8	28,003
Criminality	1,083	3,989	511	520	453	447	426	441	591	868	1,006	836	493	267	207	117	101	114	110	83	12,663
Other civil causes	530	793	93	58	189	149	257	194	107	200	270	277	250	172	163	240	203	229	237	322	4,933
Accompanying deported persons	145	262	78	145	158	165	254	235	559	274	545	626	439	81	34	57	21	10	5	3	4,096
Totals	6,907	11,774	2,106	1,686	1,716	1,585	1,886	1,964	3,963	4,376	7,025	7,131	4,474	1,128	610	571	413	434	399	428	60,576
By Nationalities																				
British	4,358	5,226	1,377	985	899	808	1,047	1,083	2,983	3,099	4,248	4,251	2,718	385	157	202	134	135	127	108	34,330
American	1,066	4,566	417	321	330	351	297	294	228	279	260	331	319	199	146	167	138	145	147	124	10,125
Other countries	1,483	1,982	312	380	487	426	542	587	752	998	2,517	2,549	1,437	544	307	202	141	154	125	196	16,121
Totals	6,907	11,774	2,106	1,686	1,716	1,585	1,886	1,964	3,963	4,376	7,025	7,131	4,474	1,128	610	571	413	434	399	428	60,576
By Provinces																				
Maritime Provinces	147	409	38	32	43	48	48	70	93	148	252	244	260	62	42	61	27	40	61	136	2,261
Quebec	1,589	2,197	301	206	233	233	240	255	480	509	984	1,343	596	163	106	129	102	112	103	139	10,020
Ontario	2,896	4,243	547	675	620	581	646	600	1,115	1,788	2,828	2,626	1,827	347	167	127	123	121	96	80	22,053
Manitoba	.....	1,310	802	242	195	177	279	403	1,296	625	1,014	858	408	71	43	32	21	22	8	14	
Saskatchewan	1,783	691	110	115	113	118	197	173	277	414	767	490	261	91	36	26	14	28	9	.....	18,787
Alberta	.....	1,041	102	134	178	169	260	187	396	511	631	738	467	184	79	77	40	19	32	9	
British Columbia	491	1,876	206	282	334	259	216	276	306	381	549	832	655	210	137	119	86	92	90	50	7,447
Yukon Territory	1	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8
Totals	6,907	11,774	2,106	1,686	1,716	1,585	1,886	1,964	3,963	4,376	7,025	7,131	4,474	1,128	610	571	413	434	399	428	60,576

Honourable T. A. CRERAR,
Minister of Mines and Resources,
Ottawa.

SIR,—I have the honour to submit a report of Soldier Settlement activities for the fiscal year ended March 31, 1941.

Included in this report are sections relating to the Three Thousand British Family Scheme, and the New Brunswick Five Hundred British Family Scheme, also field services performed by Soldier Settlement for other Departments of the Dominion Government.

Your obedient servant,

G. MURCHISON,
Director of Soldier Settlement.

OTTAWA, September 16, 1941.

SOLDIER SETTLEMENT OF CANADA

Soldier Settlement has under administration 18,035 farm properties representing a net investment of $30,444,626.12 as at March 31, 1941.

A condensed balance sheet covering loan operations since inception and a number of tables giving analyses of the present position of loans, collections, properties on hand, and debt adjustment under the Farmers' Creditors Arrangement Act are found on pages 240 to 244.

The main items to report for the fiscal year are: the best collection year since 1929-30; progress in debt adjustment under the Farmers' Creditors Arrangement Act; decrease in loan administration costs; and increase in field services related to the war, i.e., investigations for Dependents' Allowance Board.

Collections

Collections on account of loans and purchase contracts totalled $1,908,953.69 for the fiscal year 1940-41. The improvement, which applies to soldier settlers and all other classes of purchasers, is due to greater incentive to pay on the part of settlers and purchasers who have had their debts reduced in line with the value of their properties under the Farmers' Creditors Arrangement Act, improvement in production and price factors, coupled with a firm collection policy.

Debt Adjustment Under the F.C.A.A.

During the year a further 508 soldier settlers and other purchasers applied for debt reduction or extension of payment terms, bringing the total number of applications to 7,822. Boards of Review dealt with 1,729 cases, bringing the total of completed cases to 7,474. Debt reduction has been awarded in 6,173 cases, with aggregate reductions of $12,513,208.41.

With regard to soldier settlers, 4,318 or more than 50 per cent of all soldier settlers have made application; and 3,249 have been awarded debt reductions totalling $6,343,109.45, an average reduction of $1,957 per settler, or a reduction equal to 50 per cent of their former debt. Eight hundred and nine applicants received no reduction but in most cases had payment terms extended, and 229 cases are pending before Boards of Review.

Financial Position of Soldier Settlers

Of 8,118 soldier settlers whose contracts with the Department are still in force, 3,004 or 38 per cent have a substantial equity of 40 per cent or more in their farms, have their accounts in good standing, and should pay out their loans. Sixteen hundred and forty-five or 20 per cent have an equity of 10 per cent to 40 per cent in their farms and have a fair prospect of success. Thirty-four hundred and sixty-nine or 42 per cent have little or no margin of equity. Most of this last group have had their loans reduced under the Farmers' Creditors Arrangement Act during the past three years. Twenty-three hundred of this group have a fighting chance, but 1,100, despite heavy debt reduction under the F.C.A.A. have doubtful prospects of establishing substantial equities in their farms because of indifferent farming methods aggravated in many cases by advancing age or other physical disability.

Reduced Administration Costs

Loan administration costs have been further reduced by $13.368.83 during the fiscal year. This reduction represents decreases in salary costs.

Services Directly Related to the War Effort

In addition to field services for other Departments of Government which are part of regular field operations, the cost of which is paid by the respective Departments, Soldier Settlement staff has undertaken rural investigations for the Dependents' Allowance Board and special field work for the Department of National Defence. Assignments from National Defence are given priority. During the year 7,095 investigations were made for the Dependents' Allowance Board, bringing the total to 8,787 as at March 31, 1941.

Loan Administration Policy

The loan administration policy of the Department can be summed up in a few words. Soldier settlers and other purchasers are expected to meet their obligations according to their contracts, and collection policy is directed to this end. Reasonable leniency is exercised in cases of crop failure or other adversities which are beyond a settler's normal control. Special attention is directed to working out practical solutions to problem cases of ageing soldier settlers, where the interests of the veterans, their families, and the state are best served by the veterans' continued occupation of rural homes.

Condensed Balance Sheet as at March 31, 1941

ASSETS

Current Loans			
Soldier Settlement			
Soldier Settlers	$12,462,756 81		
Civilian Purchasers	7,690,170 22		
Indian Soldier Settlement	182,499 73		
		$20,335,426 76	
Less Deferred Bonus		262,892 82	
			$20,072,533 94
Three Thousand British Family Scheme			
British Families	$ 3,034,362 75		
Canadian Civilians	1,089,299 52		
		$ 4,123,662 27	
Less Deferred Bonus		13,049 24	
			4,110,613 03
New Brunswick 500 British Family Scheme			
British Families	$ 203,992 48		
Canadian Civilians	70,955 48		
		$ 274,947 96	
Less Deferred Bonus		2,147 70	
			272,800 26
			$24,455,947 23
Security Held for Resale at Book Debt			
Soldier Settlers	$ 3,631,821 44		
Civilian Purchasers	1,084,173 73		
British Families—Canadian Land	1,030,015 24		
		$ 5,746,010 41	
United Kindom Government Loans		242,668 48	
			5,988,678 89
Total			$30,444,626 12

LIABILITIES

Gross Advances for Loans			
Soldier Land Settlement	$109,034,331 75		
Three Thousand British Family Scheme	12,986,785 44		
New Brunswick 500 British Family Scheme	950,275 89		
		$122,971,393 08	
Replacements		2,794,409 93	
Interest Charges		38,297,433 42	
			$164,063,236 43
Deduct			
Repayments			
Soldier Land Settlement		$ 59,598,813 88	
Three Thousand British Family Scheme		3,090,981 49	
New Brunswick 500 British Family Scheme		156,312 74	
Replacements		2,794,409 93	
			65,640,518 04
			$ 98,422,718 39

Deduct		
Legislative Reductions		
Soldier Land Settlement	$ 47,518,215 78	
Three Thousand British Family Scheme	7,638,641 33	
New Brunswick 500 British Family Scheme	658,773 89	
		55,815,631 00
		$ 42,607,087 39
Deduct		
Losses on Security already sold		
Soldier Land Settlement	$ 23,416,786 05	
Three Thousand British Family Scheme	1,807,802 29	
New Brunswick 500 British Family Scheme	176,124 97	
	$ 25,400,713 31	
Less Farmers' Creditors Arrangement Act—Amounts charged back to previous settlers and shown in Legislative Reductions	2,969,143 17	
		22,431,570 14
		$ 20,175,517 25
Add		
Interest Exemption Act 1922—Not charged to settlers		10,269,108 87
		$ 30,444,626 12

Number of Settlers as at March 31, 1941

District	Current Loans					Security on Hand			Grand Total
	Soldier Land Settlement			British Family Settlement	Total	Soldier Land Settlement	British Family Settlement	Total	
	Soldier	Civilian	Total						
Vancouver	1,061	1,017	2,078	99	2,177	73	27	100	2,277
Edmonton	1,438	1,232	2,670	290	2,960	263	63	326	3,286
Calgary	1,104	536	1,640	253	1,893	158	33	191	2,084
Saskatoon	2,424	1,496	3,920	338	4,258	848	139	987	5,245
Winnipeg	701	880	1,581	147	1,728	293	69	362	2,090
Toronto	617	491	1,108	82	1,190	59	24	83	1,273
Sherbrooke	76	180	256	19	275	5	3	8	283
Saint John	473	460	933	266	1,199	31	43	74	1,273
Indian Soldier Settlement	224	.....	224	.....	224	.....	.....	.....	224
Total	8,118	6,292	14,410	1,494	15,904	1,730	401	2,131	18,035

Financial Statement as at March 31, 1941

District	Active Loans		Security on Hand at Book Debt		Total	
	No.	Amount	No.	Amount	No	Amount
		$ cts.		$ cts.		$ cts.
Vancouver	2,177	2,935,403 87	100	224,281 84	2,277	3,159,685 71
Edmonton	2,960	4,750,803 10	326	808,100 22	3,286	5,558,903 32
Calgary	1,893	3,345,381 63	191	507,827 57	2,084	3,853,209 20
Saskatoon	4,258	7,363,736 32	987	3,017,400 70	5,245	10,381,137 02
Winnipeg	1,728	2,743,029 27	362	1,173,595 63	2,090	3,916,624 90
Toronto	1,190	1,622,974 42	83	172,965 27	1,273	1,795,939 69
Sherbrooke	275	313,287 69	8	8,209 83	283	321,497 52
Saint John	1,199	1,198,831 20	74	76,297 83	1,273	1,275,129 03
Indian Soldier Settlement	224	182,499 73	.....	.....	224	182,499 73
Total	15,904	24,455,947 23	2,131	5,988,678 89	18,035	30,444,626 12

Farmers' Creditors Arrangement Act Applications as at March 31, 1941

District	Soldier Settlers				Civilian Settlers (including British Civilians)				British Families				Totals		
	Number of applications	Pending	Settled—Reduction	Settled—No Reduction	Number of applications	Pending	Settled—Reduction	Settled—No Reduction	Number of applications	Pending	Settled—Reduction	Settled—No Reduction	Pending	Settled	Applications
Vancouver	677	16	438	223	356	.....	270	86	98	.....	93	5	16	1,115	1,131
Edmonton	640	59	500	81	378	25	295	58	262	4	252	6	88	1,192	1,280
Calgary	740	16	633	91	206	5	168	33	256	.....	252	4	21	1,181	1,202
Saskatoon	1,293	96	1,051	146	526	44	422	60	351	10	323	18	150	2,020	2,170
Winnipeg	395	42	299	54	223	16	158	49	150	15	121	14	73	695	768
Toronto	340	.....	181	159	139	.....	98	41	93	.....	80	13	.....	572	572
Sherbrooke	43	.....	23	20	50	.....	38	12	21	.....	20	1	.....	114	114
Saint John	190	.....	155	35	78	.....	62	16	139	.....	125	14	.....	407	407
New Brunswick	.....	.....	.....	.....	.....	.....	.....	.....	178	.....	165	13	.....	178	178
Total	4,318	229	3,280	809	1,956	90	1,511	355	1,548	29	1,431	88	348	7,474	7,822

Farmers' Creditors Arrangement Act as at March 31, 1941

Soldier Settlers

District	Cases with Reduction	Debt	Reduction	Average Reduction	Percentage of Reduction
		$ cts.	$ cts.		
Vancouver	438	1,502,263 04	709,242 62	1,619	47·2
Edmonton	498	1,913,970 09	933,380 62	1,874	48·8
Calgary	633	2,758,800 73	1,415,061 35	2,235	51·3
Saskatoon	1,026	4,253,616 79	2,215,765 12	2,160	52·1
Winnipeg	295	1,237,405 85	689,613 46	2,338	55·7
Toronto	181	544,980 22	173,386 06	958	31·8
Sherbrooke	23	71,057 39	34,382 18	1,495	48·4
Saint John	155	382,219 07	172,278 04	1,115	45·1
Total	3,249	12,664,313 18	6,343,109 45	1,957	50·1

Civilian Settlers

Vancouver	232	772,803 31	340,488 61	1,468	44·1
Edmonton	267	879,052 30	435,795 65	1,632	49·6
Calgary	153	590,545 80	321,321 85	2,100	54·4
Saskatoon	398	1,532,178 85	856,247 24	2,151	55·9
Winnipeg	148	440,833 13	213,059 67	1,440	48·3
Toronto	83	244,397 50	101,868 48	1,227	41·7
Sherbrooke	36	112,857 01	52,815 53	1,467	46·8
Saint John	46	101,591 67	41,260 84	897	40·6
Total	1,363	4,674,264 57	2,362,857 87	1,734	50·6

British Families

Vancouver	93	407,653 24	219,590 43	2,361	53·9
Edmonton	250	1,627,953 45	706,360 11	2,825	43·4
Calgary	252	1,361,680 89	703,322 58	2,791	51·7
Saskatoon	320	2,425,366 82	975,764 96	3,049	40·2
Winnipeg	120	609,866 76	345,642 97	2,880	56·7
Toronto	80	338,935 13	125,899 60	1,574	37·1
Sherbrooke	20	69,714 27	34,636 89	1,731	50·0
Saint John	125	414,418 66	224,119 52	1,793	54·1
New Brunswick	165	539,195 67	295,736 10	1,792	54·8
Total	1,425	7,794,784 89	3,631,063 16	2,548	46·6

Farmers' Creditors Arrangement Act as at March 31, 1941—Concluded

BRITISH FAMILIES—CIVILIANS

Vancouver	38	134,128 23	57,775 46	1,520	43·1
Edmonton	25	83,128 52	30,923 60	1,237	37·2
Calgary	15	59,118 17	29,491 82	1,966	49·9
Saskatoon	16	53,710 94	24,391 19	1,524	45·4
Winnipeg	9	26,789 93	9,405 53	1,045	35·1
Toronto	15	42,862 07	14,121 27	941	32·9
Sherbrooke	2	5,023 03	1,358 40	679	27·0
Saint John	16	23,896 93	8,710 66	544	36·5
Total	136	428,657 82	176,177 93	1,295	41·1
Grand Total	6,173	25,562,020 46	12,513,208 41	2,027	49·0

NOTE:—Accounts not yet adjusted by Treasury, 49.

Collections—1940-41

SOLDIER SETTLERS

District	Amount Due		Total Cash Received					Total
	Instalment Due 1940	Total Due Including Arrears	Due Payments	Per Cent of Current Instalment	Per Cent of Total Due	Pre-payments	Leases	
	$ cts.	$ cts.	$ cts.			$ cts.	$ cts.	$ cts.
Vancouver	110,628 37	241,941 89	134,570 95	121·6	55·6	52,434 51	2,399 10	189,404 56
Edmonton	214,392 25	673,774 40	142,223 73	66·3	21·1	9,776 88	10,581 68	162,582 29
Calgary	190,333 29	462,807 84	123,884 64	65·1	26·8	19,645 75	7,776 17	151,306 56
Saskatoon	354,004 53	1,328,000 75	203,894 59	57·6	15·4	20,391 69	35,309 21	259,595 49
Winnipeg	128,248 30	309,723 96	65,908 05	51·4	21·3	10,356 03	10,804 36	87,068 44
Toronto	80,520 53	119,636 23	79,827 30	99·1	66·7	23,287 07	2,970 54	106,084 91
Sherbrooke	14,485 87	25,466 55	14,272 88	98·5	56·0	3,744 51	260 22	18,277 61
Saint John	49,051 72	110,965 55	41,206 96	84·0	37·1	11,746 06	412 42	53,365 44
Total	1,141,664 86	3,272,317 17	805,789 10	70·6	24·6	151,382 50	70,513 70	1,027,685 30

CIVILIAN PURCHASERS

Vancouver	123,317 53	210,855 12	131,418 38	106·6	62·3	62,772 69	.....	194,191 07
Edmonton	163,640 33	374,148 59	116,494 80	71·2	31·1	12,160 25	.....	128,655 05
Calgary	76,969 60	169,057 02	58,043 45	75·4	34·3	12,278 29	.....	70,321 74
Saskatoon	173,277 77	518,031 59	111,239 82	64·2	21·5	12,343 87	.....	123,583 69
Winnipeg	98,690 75	200,225 06	66,633 30	67·5	33·3	15,236 00	.....	81,869 30
Toronto	54,408 74	78,472 41	53,899 56	99·1	68·7	17,191 06	.....	71,090 62
Sherbrooke	22,545 32	30,679 80	20,360 18	90·3	66·4	6,801 89	.....	27,162 07
Saint John	37,880 81	69,445 67	33,937 90	89·6	48·9	20,711 79	.....	54,649 69
Total	750,730 85	1,650,915 26	592,027 39	78·9	35·9	159,495 84	.....	751,523 23

BRITISH FAMILY SETTLEMENT

District	Amount Due		Total Cash Received					Total
	Instalment Due 1940	Total Due Including Arrears	Due Payments	Per Cent of Current Instalment	Per Cent of Total Due	Pre-payments	Leases	
	$ cts.	$ cts.	$ cts.			$ cts.	$ cts.	$ cts.
Vancouver	11,325 75	19,723 57	10,411 63	91·9	52·8	3,178 56	.....	13,590 19
Edmonton	49,598 25	132,699 97	21,288 02	42·9	16·0	2,981 55	.....	24,269 57
Calgary	40,754 59	89,457 25	19,630 30	48·2	21·9	267 14	.....	19,897 44
Saskatoon	43,915 28	116,843 46	12,782 83	26·1	10·7	253 24	.....	13,036 07
Winnipeg	22,213 57	44,496 51	9,403 92	42·3	21·1	266 61	.....	9,670 53
Toronto	14,703 27	25,664 03	11,506 02	78·3	44·8	2,020 73	.....	13,526 75
Sherbrooke	2,962 04	4,849 36	3,425 58	115·6	70·6	978 24	.....	4,403 82
Saint John	13,309 78	29,157 28	12,042 24	90·5	41·3	1,587 07	.....	13,629 31
New Brunswick	15,756 69	31,124 48	14,595 43	92·6	46·9	3,126 05	.....	17,721 48
Total	219,539 22	496,015 91	115,085 97	52·4	23·2	14,659 19	.....	129,745 16

Collections—1940-41—Concluded

SUMMARY

Soldier Settlers...	1,141,664 86	3,272,317 17	805,789 10	70·6	24·6	151,382 50	70,513 70	1,027,685 30
Civilian Purchasers.....	750,730 85	1,650,915 26	592,027 39	78·9	35·9	159·495 84	.....	751,523 23
British Family Settlement.....	219,539 22	496,015 91	115,085 97	52·4	23·2	14,659 19	.....	129,745 16
Total.....	2,111,934 93	5,419,248 34	1,512,902 46	71·6	27·9	325,537 53	70,513 70	1,908,953 69

Field Work for other Departments of Government as at March 31, 1941

Class of Work	Vancouver	Edmonton	Calgary	Saskatoon	Winnipeg	Toronto	Sherbrooke	Saint John	Total
Department of National Defence—									
Dependents' Allowance Board—Investigations	677	393	393	900	550	2,178	.....	2,004	7,095
Property Damage—R.C.A.F. Investigations	1	.....	.....	.....	.....	.....	.....	.....	1
Department of Pensions and National Health—									
War Veteran's Allowance Board—Initial Investigations	243	111	56	129	97	345	63	129	1,173
War Veterans' Allowance Board—Check Investigations	762	365	267	598	324	1,405	301	482	4,504
Relief Investigations	182	27	19	174	167	686	77	55	1,387
Canadian Pension Commission—Investigations	6	8	9	32	.....	2	34	.....	91
Department of Finance—									
Boards of Review—Farmers' Creditors Arrangement Act, Land Appraisals.	6	392	238	859	50	.....	.....	1	1,546
Canadian Farm Loan Board—Land Appraisals	.....	.....	.....	.....	.....	18	.....	.....	18
Department of Mines and Resources—									
Indian Affairs Branch—Collection visits	1	152	.....	117	.....	.....	.....	.....	270
Lands, Parks and Forests Branch—Investigations	.....	12	.....	.....	.....	6	8	2	28
Seed Grain Lien Adjustments—Land Inspections	.....	.....	.....	74	.....	.....	.....	.....	74
Seed Grain—Adjustment of Liens	.....	.....	.....	178	.....	.....	.....	.....	178
Immigration Branch—Investigations	3	.....	.....	2	.....	5	.....	.....	10
Secretary of State—									
Enemy Alien Estates—Investigations.	9	11	1	2	1	3	.....	1	28
Department of Agriculture—									
Prairie Farmers' Assistance Act—Investigations	.....	.....	.....	82	.....	.....	.....	.....	82

NOTE:—District Superintendents Edmonton and Winnipeg were members of Committees which adjusted 282 seed grain liens in Alberta and 7 in Manitoba.