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, 1940

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

Price, 50 cents

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CONTENTS

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INDEX OF STATISTICAL TABLES

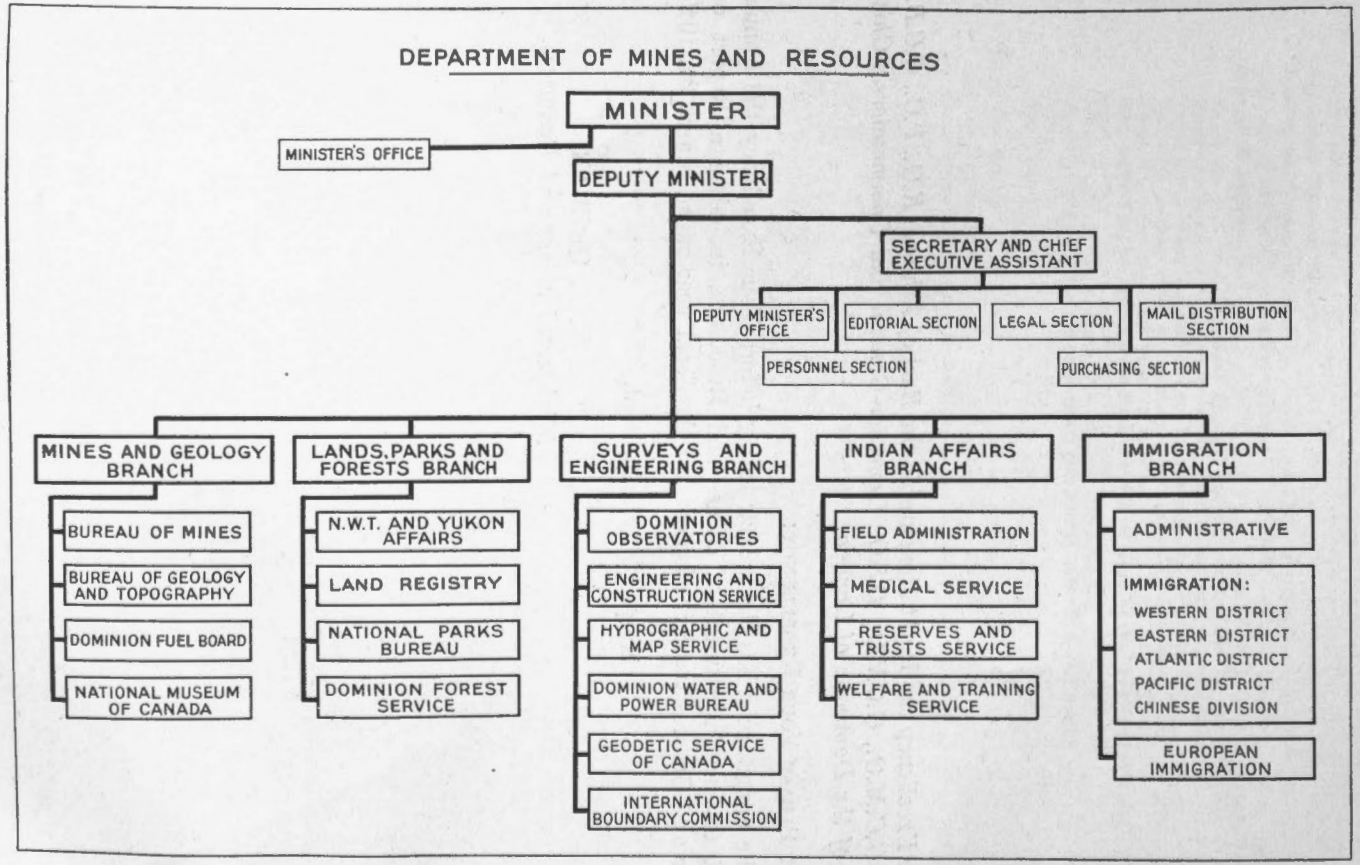
To His Excellency the Right Honourable the Earl of Athlone, K.G., P.C., G.C.B., G.C.M.G., G.C.V.O., D.S.O., Governor-General and Commander-in-Chief of the Dominion of Canada.

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, 1940.

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, 1940

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

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

The declaration of war, coming as it did towards the end of the field season, did not adversely affect the volume of work of the Department to a great extent. By September the various field appropriations had been spent, or fully allocated, and although steps were taken promptly to keep down expenditure of funds it was rather late to reduce or cancel the work that had been committed to the Department by Parliament. Expenditures during the year exceeded those of 1938-39 by over $5,000,000. Over half the increase was due to much heavier payments to subsidize the movement of Canadian coal to the central provinces. The vote to assist the provinces in the improvement of main tourist highways was increased by $2,000,000 and the balance of the difference was made up of increases in other items in the Special Supplementary Estimates, such as that relating to National Parks and Historic Sites.

Revenue collected by the Department was about the same as in the previous year—a slight increase being reported.

Even before war was declared the work programs of certain departmental services had been modified to give precedence to matters of importance from a national defence standpoint. This was especially so in the Hydrographic and Map Service. Surveys had been conducted to determine what contribution could be made to a war effort by the Mines and Forest Products Laboratories. Once war was declared this trend was accentuated and clarified. The Bureau of Mines collected information concerning stocks of strategic war minerals and with the Geological Survey commenced an intensive survey of deposits and prospective producers. The Mines Laboratories carried on special research work, conducted physical and chemical tests of materials entering into munitions of all kinds, and carried out check-testing for the Department of Munitions and Supply, the Defence Departments, the British Air Ministry, and other organizations. The Explosives Division advised on matters pertaining to the expansion of the explosives industry and co-operated with Dominion and Provincial police in an effort to ensure the safekeeping and disposal of explosives.

The Forest Products Laboratories at Ottawa, Montreal, and Vancouver conducted special investigations into the use of forest products in the war effort. At Ottawa, containers for shells, bombs, rifles, machine guns, and other goods were designed and tested. Various fire retardants, and glued plywoods were tested.

The Montreal Laboratory investigated, produced, and tested pulps as a source of explosives. At the Vancouver Laboratory efforts were applied largely to problems connected with the use of Sitka spruce and suitable plywoods in the aircraft industry.

Upon the outbreak of hostilities two hydrographic ships, were transferred to the Navy. During the year the Hydrographic Service was employed largely on work connected with national defence. The same is true of the Map Production Division. Its equipment was used to capacity on maps for the defence services.

The Immigration Branch enforced the provisions of P.C. 2653, dated September 14, 1939, prohibiting the entry into Canada of enemy aliens, and nationals of any territory occupied by the enemy. The Branch is also responsible for looking after distressed Canadians, overseas.

The foregoing touches on only a few of the contributions being made to the war effort by the Department of Mines and Resources. Naturally the functions of some services are of such a nature that demands made on them by war organizations were limited and the curtailment of appropriations for such divisions had to be considered in advance of the new fiscal year. A number of positions that became vacant through death or resignation were allowed to lapse. Steps were taken towards the retirement of about fifty permanent employees—as well as a number of temporaries. All such positions were abolished. As of March 31, 1940, eighteen permanent and nine temporary employees had enlisted. Four persons only were taken on to replace them temporarily. Quite a number in "exempt" positions had also left the Department to enlist. In addition, a considerable number of permanent departmental employees were loaned to war offices.

The work carried out during the year is dealt with in the reports of the Directors, which follow. As will be noticed, the Annual Report as a whole is shorter. The text has been condensed and some statistics left out.

SUMMARY OF REVENUE AND EXPENDITURE FOR FISCAL YEAR 1939-40

	Revenue	Expenditure Ordinary	Expenditure Special	Total Expenditure
General Administrative Branch		$ 178,652 98	.....	$ 178,652 98
Mines and Geology Branch—				
Branch Administration	$ 1 50	31,751 29		
Bureau of Mines	20,085 97	455,568 11		
Bureau of Geology and Topography	[1]3,719 85	[2]740,164 90	23,731 41	
National Museum of Canada	.....	70,252 71		
Dominion Fuel Board	2,273 48			
Administration ...$ 26,767 68				
Coal Subventions .. 4,478,707 08				
Domestic Fuel Act. 53,213 55				
		4,558,688 31		
Assistance in improving transportation facilities into mining areas	69 24	.....	[3]1,119,302 71	
	$ 26,150 04	$ 5,856,425 32	$1,143,034 12	
				$ 6,999,459 44
Lands, Parks and Forests Branch—				
Branch Administration	.....	20,255 31		
Dominion Lands, Ordnance Lands, etc.	45,510 41	75,677 69		
National Parks and Historic Sites	391,570 64	1,295,913 21	[4]1,540,623 20	
Forestry	14,434 67	350,827 90	[4] 234,218 19	
Northwest Territories	[5]150,479 40	292,028 88		
Yukon Territory	100,450 24	92,318 34		
	$702,445 36	$ 2,127,021 33	$1,774,841 39	
				$ 3,901,862 72

SUMMARY OF REVENUE AND EXPENDITURE FOR FISCAL YEAR 1939-40—*Conc.*

	Revenue	Expenditure Ordinary	Expenditure Special	Total Expenditure
Surveys and Engineering Branch—				
Branch Administration		22,384 73		
Dominion Observatories	111 14	144,924 79		
Water and Power Bureau	31,784 45	266,919 25		
Geodetic Service	225 35	156,160 63		
International Boundary Commission	336 25	30,637 40		
Engineering and Construction	1,073 16	112,165 43	[3] [6]3,513,866 41	
Hydrographic Service	8,064 58	408,531 42		
Legal Surveys and Map Service	9,815 65	160,058 50		
	$ 51,410 58	$ 1,301,782 15	$3,513,866 41	
				$ 4,815,648 56
Indian Affairs Branch—				
Branch Administration		55,726 70		
Indian Agencies—Administration	970 63	728,670 30	32,331 42	
Reserves and Trusts—Administration	106 63	37,541 67	92,677 13	
Indian Education	470 59	2,097,180 71	234,372 90	
Medical Services		1,478,854 60	46,562 12	
Welfare of Indians	8,128 01	1,020,659 57		
Miscellaneous Statutory Items (Indian Annuities)		259,594 00		
Miscellaneous Revenue—not including revenue accruing to Indian Band funds	4,909 92			
	$ 14,585 18	$ 5,678,227 55	$ 405,943 57	
				$ 6,084,171 12
Immigration Branch—				
Administration of the Immigration Act and the Chinese Immigration Act		162,276 02		
Field and Inspectional Service—Canada		1,051,717 10		
Field and Inspectional Service—Abroad		118,858 63		
Relief of Distressed Canadians outside Canada		5,325 63		
Special War—Repatriation of Distressed Canadians Abroad			18,399 98	
Miscellaneous Statutory Items		1,835 63		
Miscellaneous Revenue	$ 15,021 66			
	$ 15,021 66	$ 1,340,013 01	$ 18,399 98	
				$ 1,358,412 99
Totals for Department	$809,612 82	$16,482,122 34	$6,856,085 47	$23,338,207 81

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—

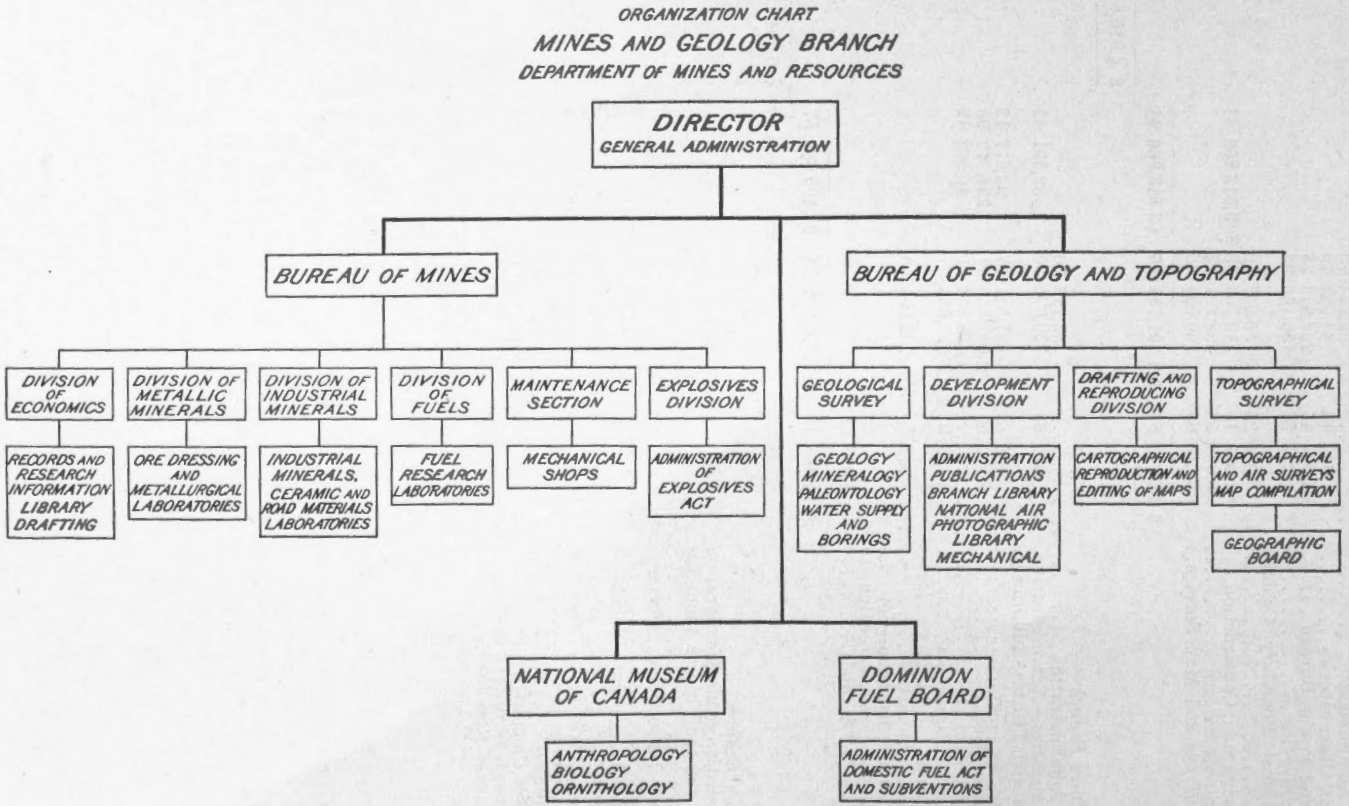
Department of Public Works—

Vote 515—To assist in provision of transportation facilities into mining areas, Northwest Territories	$ 1,735 53
Vote 522—Development of Tourist Highways (Province of Quebec)	411,356 06
Department of National Defence—	
Vote 517—Historic Sites. Provinces of Nova Scotia, New Brunswick, and Quebec	136,733 69

NOTES.—[1] Includes revenue of National Museum of Canada.
[2] Includes $20,000 expended from funds transferred from Department of National Defence.
[3] Includes contributions to Provinces for work on roads.
[4] Includes $312,354.92 expended from funds transferred from Department of Labour.
[5] Also liquor profits, fines, etc., credit balance in Trust Account, March 31, 1940, $2,278.82.
[6] Includes $55,950.34 expended from funds transferred from Department of Labour.

Your obedient servant,

CHARLES CAMSELL,
Deputy Minister.



Organization Chart, Mines and Geology Branch.

MINES AND GEOLOGY BRANCH

JOHN McLEISH, DIRECTOR

The continued progress of the Canadian mineral industry, with its achievement of a new record of $473,107,021 in the value of production in 1939, was accompanied by a corresponding increase in the demand on the services of the Mines and Geology Branch. The greater the output of the mines the more numerous are the requests for research and investigative work designed to improve treatment methods and thus lower recovery costs.

On the outbreak of war in September it was readily apparent that the industry would be called upon to meet an unprecedented demand for metals and minerals. It is well prepared to do this, for Canada is at present a leading producer of most of the principal metals and is also an important producer of many of the essential industrial minerals. Of special importance is the fact that the base metals are for the most part now refined in the Dominion, whereas in the years of the first Great War the tonnages refined within the country were relatively small. By arrangements made early in the war the huge Canadian surpluses of these metals are made available to the United Kingdom at prices approximating those in effect at the time that agreements were made.

It was apparent, also, on the commencement of the war that the services that the Branch is equipped and organized to render would henceforth be linked closely with Canada's war effort. As the field work for the most part was completed by September, this applies in particular for the year under review to the laboratory and other investigative work of the Bureau of Mines. During the last 7 months of the fiscal year the facilities of this Bureau were employed in the main on work for the Departments of National Defence and Munitions and Supply, the British Supply Board in Canada and the United States, and other Government war organizations, and in test and research work in the production of essential war minerals. Owing, however, to the nature of certain of the activities of the Bureau of Mines, and of the principal activities of the Bureau of Geology and Topography, the extent of the change over in the services of the Branch from a peace-time to a war-time basis is not so apparent in this report as will be the case in that for the succeeding fiscal year.

The detailed accounts of its activities as given by the heads of divisions in the pages that follow will afford some idea of the diversity of the Branch's investigations, and more especially of how well prepared it is by way of facilities and equipment to render the most valuable services to the industry and to the country in our war effort. The importance of these features will become steadily more apparent as the war continues.

MINING ROADS DIVISION

Assistance Toward Mining Transportation

The Branch continued to administer the special funds voted by Parliament to assist in the providing of transportation facilities into mining areas, the vote for the fiscal year 1939-40 being $1,250,000, those for the three previous

years being $1,310,000 in 1938-39, $1,400,000 in 1937-38, and $1,500,000 in 1936-37, or a total for the 4 years of $5,460,000. Of this total only slightly more than 10 per cent remained unexpended on the programs, which have been of benefit to mining areas throughout the Dominion. From these funds payments to the provinces have totalled approximately $4,526,000. These payments represent a two-thirds contribution to accepted "construction costs" on provincial undertakings amounting to $6,789,000. The funds provided by the Dominion Government were used also to finance improvements to mining transportation in Yukon, amounting to $170,000, and in the Northwest Territories, amounting to $113,000. Thus, exclusive of excess costs borne by the provinces alone and of substantial contributions of work or of funds by mining companies, and exclusive also of administrative costs, approximately $7,072,000 of Dominion and Provincial funds were expended in the 4 years on the co-operative efforts to improve transportation into areas where mining development had been retarded by the lack of roads or other transport facilities.

Following the practice of previous years, the undertakings on approved projects in 1939-40 were carried out by the provinces under agreements providing that the Dominion would reimburse two-thirds of the provincial outlays on construction costs. Projects in Yukon and Northwest Territories, as before, were executed under Dominion organization. Construction work on 148 projects was carried on throughout the fiscal year.

A particularly noteworthy result of the year's activities was the fact that the Manson-Germansen placer mining areas north of Vanderhoof, British Columbia, were finally given the benefits of greatly reduced transportation costs after four seasons of construction on the Manson Creek road north of Fort St. James. Although it is not yet a highly developed road it is now possible to haul mining equipment and supplies by motor truck for 182 miles from Vanderhoof to Omineca River, and a winter road that has been opened for 95 miles beyond the Omineca gives access to Aiken Lake, in which area there has been lode-mining development. During the year, the Great Slave Lake winter road in northern Alberta and the Northwest Territories, which is more than 400 miles in length, was completed. By this road the town of Peace River becomes the starting point for tractor-train transportation to the Yellowknife and other mining areas north of Great Slave Lake. In Saskatchewan considerable progress was made on the construction of the road from Montreal Lake to Lac La-Ronge, and in Manitoba the further improvement of the Bowsman-The Pas highway and the extension of this road for some distance towards Cranberry Portage was an important part of the program. In Ontario the further improvement of the all-weather road from Goldpines to Confederation Lake and its extension to the Uchi mine was the largest project. The program in Quebec included the gravelling of a considerable part of the Rose Lake road, and the York River road reached the area of Gaspe Peninsula, in which mineral prospecting and development is taking place.

A maximum of more than 3,500 workers were employed on all projects in the peak month and the total man-days of work amounted to 220,000, additional employment being provided in organizations concerned with the supply of construction materials and with the provisioning and equipping of camps. In direct employment alone more than $800,000 was paid in salaries and wages, the work being given mainly to persons in relief and needy classifications.

Maximum expenditures provided for under the agreements with the provinces and by appropriations for work in the Northwest and Yukon Territories were as follows:

Mining Roads	Maximum Dominion Contribution	Maximum Provincial Contribution	Total Expenditure Provided for
	$	$	$
Nova Scotia	25,000	12,500	37,500
Quebec	245,000	122,500	367,500
Ontario	245,000	122,500	367,500
Manitoba	210,000	105,000	315,000
Saskatchewan	130,000	65,000	195,000
Alberta	50,000	25,000	75,000
British Columbia	240,000	120,000	360,000
Northwest Territories[1]	23,920	.....	23,920
Yukon Territory	40,000	.....	40,000
	1,208,920	572,500	1,781,420

[1] Includes $500 for improvement of navigation on Athabaska River in Alberta, but funds not expended.

Some of the funds were required, however, for settlement of 1938-39 accounts unpaid at the close of that fiscal year, and after providing for these accounts approximately $1,753,000 of the Dominion and Provincial funds remained available for new construction in the 1939-40 fiscal year. It is estimated that on the complete settlement of accounts $1,610,920 of Dominion and Provincial funds will have been required for the works actually executed in 1939-40. Thus, considered collectively, 92 per cent of the amount of appropriations available for construction in the various provinces and territories in the fiscal year were actually used, a percentage that might have been larger but for the outbreak of war.

Below are the values of the works executed by provinces and territories in the fiscal years 1936-37, 1937-38, and 1938-39, together with the approximate value of the works done in the fiscal year 1939-40, all figures being exclusive of the administrative costs of the Dominion and the provinces:

Mining Roads	Value of Works Executed 1936-37[1]	Value of Works Executed 1937-38[1]	Value of Works Executed 1938-39[1]	Approximate Value of Works Executed 1939-40[1]
	$	$	$	$
Nova Scotia	37,001	36,972	36,751	36,484
Quebec	525,000	448,080	368,277	333,730
Ontario	487,533	520,000	351,000	290,816
Manitoba	329,666	315,961	342,554	305,354
Saskatchewan	80,576	149,785	161,725	167,053
Alberta	.....	.....	33,688	72,523
British Columbia	363,664	328,872	341,595	346,522
Northwest Territories	32,310	13,319	49,823[2]	18,443
Yukon	19,712	62,234	47,789	39,995
	1,875,462	1,875,223	1,733,202	1,610,920

[1] The values herewith reported are those of works financed from Dominion and Provincial funds exclusive of works paid for by mining interests.

[2] Includes expenditure for improvement of navigation on Athabaska River in Alberta.

Mining Transportation Projects, 1939-40

Nova Scotia

Beaver Dam Mine road
Moose River and Mooseland road
Caribou Mine road
Killag Mine road
Montague Mine road
Oldham Mine road
Lake Catcha Mine road
Renfrew Mine road
Manganese Mine road
Mount Uniacke Mine road
South Uniacke Mine road
Antimony Mine road
Withrow Mine road
Croft road to Lacey Mine
Seal Harbour Mine road
Otter Lake Mine road
Forest Hill Mine road
Mountain Mine road
Wine Harbour Mine road
Liscomb power plant road
Miller Lake Mine road
Dickson Mine road
Molega Mine road
Whiteburne Mine road
Kemptville and Lake Annis road
Guards Pond road
Farm Lake road
Lake Charlotte Mine road
Goldbrook Mine road

Quebec

Tiblemont township road
Cassels-Duval Mine road
York River road (west section)
Val d'Or-Senneville township road
Waite to Amulet Mine road
York River road (east section)
Rose Lake road
Flordin Mine winter road
Grande Cascapedia road

Ontario

Nezah-Sturgeon River Mine road
Upper Canada Mines road
McKenzie Island roads
Hiawatha Mine road
Madsen-Red Lake road
Houston Lake-Westree road
Atikokan-Steeprock Lake road
Gowganda-Tyranite road
Albany River Mine road
Golden Gate Mine road
Hasaga Mine road
Afton Mine road
Timmins-Naybob Mine road
Cobalt-Gillies Limit mine road
Canadian Lorrain Mine road
White Valley Chemicals, Limited, road
Elk Lake-Gowganda road
Matachewan-Young Davidson and Matachewan Consolidated road
Yama Mine road
Credo Porcupine Mine road
Canadian Flint and Spar road
Aunor Mine road
Back road to Timmins
Bankfield Mine road
Regnery Mine road
Upper Seine Mine road
Faymar Mine road
Geraldton-Little Long Lac road
Madsen to Starratt-Olsen road
Uchi Mine road
Straw Lake Beach Mine water route
Kelrowe Mine road
Kerr-Addison to Cheminis road
Northern Empire Mine road
Kenricia Mine road
Paramount Syndicate road
Beaverhouse Lake Mine road
Savant Lake Station-Sturgeon Lake road

Manitoba

Bowsman-The Pas highway
Flin Flon-Channing airport road
Channing-Lake Manistikwan road
Clearwater Lake road
Rahls Island road
Gods Lake winter road
Road at Cranberry Portage
Setting Lake-Nelson House winter road
Sherridon-Cold Lake road
Wabowden-Norway House winter road
Whiskey Jack Portage
The Pas-Cranberry Portage road
Pine Falls-Lac du Bonnet road
Long Lake-Gunnar road
Government Landing-Quesnel Lake-Bissett road
Caribou Dam
Boat Channel at Rat Portage
Manigotagan-Hole River road
Bissett-Gunnar road
Lac du Bonnet-Pointe du Bois road
Landing River Dam
Ilford to Airport road
Provincial highway No. 11 north to Lac du Bonnet
Bird River road
Elk Island trail

Saskatchewan

Lac La-Ronge road
Big River to Grand Rapids
Nipawin to Flin Flon

Alberta

Great Slave Lake winter tractor road
Road from Black Diamond south

British Columbia

Mount Zeballos Gold Mines road
Manson Creek road
Aiken Lake winter road
Boulder Creek road
Zeballos River road
Barkerville-Yanks Peak road
Lemon Creek headwaters road
Bitter Creek trunk trail
Glacier Creek trunk trail
Beaver Pass-Willow River trail
Hobson Creek trail
Bear River-Meziadin Lake trail
Wells-Sugar Creek road
Winslow Mine road
Germansen connection to Aiken Lake
Spruce Creek cut-off road
Bedwell River road
Spud Valley road
Kennedy Lake road
Keithley-Yanks Peak road
Kennedy Mine road
Upper Unuk River trail
China Creek road
Downey Pass road
Silver Ridge mining road
Spruce Creek road extension
Likely-Keithley road
Hudson Hope westerly road
American Creek trail
Manson-Germansen road
Pinchi Mercury winter road

Northwest Territories

Landing fields and seaplane bases
Yellowknife settlement roads
Fort Smith waterfront road
Cut through bar at McMurray
Road and wharf, Latham Island
Great Slave Lake winter tractor road

Yukon

Road to Mount Freegold area
Hunker, .Dominion, and Sulphur Creeks roads
Dawson-Boundary and Upper Sixtymile district roads
Extension of Silver King road to Sime claims on Galena Hill and connection with Keno Hill road
Landing fields at Whitehorse, Dawson, Mayo, Carcross, and Minto

Development of Tourist Highways in Manitoba and Saskatchewan

As in the preceding year, the mining roads division of the Branch administered part of a special vote by Parliament for the development of tourist highways. The 1939-40 vote for this purpose was $3,750,000 compared with $1,750,000 in the previous year. The $850,000 part of the vote administered by the division was allotted to the construction and improvement of tourist roads in Manitoba and Saskatchewan.

The agreements between the Dominion and the two provincial governments with respect to mining road work also contained clauses relating to tourist road work as provincial undertakings. These called upon the Dominion to contribute one-third of the construction costs of projects in Manitoba and one-fifth of such costs in Saskatchewan.

Construction work by the Government of Manitoba was carried out on 92 projects and in Saskatchewan work was undertaken on 117 projects. More than 7,700 workmen were employed and total direct man-days of work amounted to about 275,000, direct payments of salaries and wages, mainly to persons in relief and needy categories, amounting to about $960,000.

In Manitoba approximately one-third of the total funds were expended on the grading and stabilizing of 37 miles of the Trans-Canada highway from Portage la Prairie to Sidney, and close to one-third in the hard-surfacing of 68 miles of important tourist roads. The tourists roads, seven bituminous surfacing projects, included 53 miles on approach roads to Riding Mountain National Park and 8 miles on the Winnipeg Beach road. Some $500,000 of the

Dominion and Provincial funds were used in the remaining projects, many of which are of importance in the development of inter-lake and other tourist traffic. These projects involved the grading, gravelling, erection of bridges, and other improvements on more than 650 miles of road, the gravelling being done on about 480 miles. Closely linked with many of the projects, but not fully reflected in the figures, was the work done or financed by some 44 municipalities, expenditures of which totalled more than $60,000.

In Saskatchewan much was accomplished toward the encouragement of tourist travel across that province and to Prince Albert National Park and other northerly areas. Further progress was made in the provision of all-weather roads, 932 miles of gravel surfacing, including about 780 miles of preparation of subgrade, having been carried out on provincial highways. In addition, 373 miles of provincial highways and 293 miles of secondary highways were graded. The bituminous surfacing from Saskatoon west was extended 4 miles and a total of 43 miles of seal coating was carried out in six projects on this and previously bituminous-surfaced mileage in the vicinities of Regina, Saskatoon, and Swift Current. Altogether, Dominion funds were of assistance in the improvement of some 1,640 miles of road. There were also five separate highway bridge projects, in which a steel bridge and four concrete bridges were erected.

Maximum expenditures provided for under the agreements with Manitoba and Saskatchewan were as follows:

Tourist Roads	Maximum Dominion Contribution	Maximum Provincial Contribution	Total Expenditure Provided for
	$	$	$
Manitoba	475,000	950,000	1,425,000
Saskatchewan	375,000	1,500,000	1,875,000
	850,000	2,450,000	3,300,000

Small amounts were required, however, for the settlement of 1938-39 accounts, following which $3,294,746 of the Dominion and Provincial funds remained available for new construction in the 1939-40 fiscal year. It is estimated that on complete settlement of accounts $3,250,332 of Dominion and Provincial funds will have been required for works actually executed in 1939-40. Thus, approximately 99 per cent of the appropriations available for construction work on Manitoba and Saskatchewan tourist roads was used in the year covered by this report.

Below are the values of the tourist road works executed in Manitoba and Saskatchewan in 1938-39 and the approximate values for 1939-40:

Tourist Roads	Value of Works Executed 1938–39	Approximate Value of Works Executed 1939–40
	$	$
Manitoba	1,274,604[1]	1,401,831[1]
Saskatchewan	1,705,865	1,848,501
	2,980,469	3,250,332

[1] Exclusive of the value of work carried out independently or financed by municipalities in connection with the projects.

BUREAU OF GEOLOGY AND TOPOGRAPHY

The Bureau of Geology and Topography has four main divisions, namely, the Geological Survey, Development, Topographical Survey, and Draughting and Reproducing Divisions, the duties of which, as well as their activities during the year, are dealt with on subsequent pages.

Thirty-three geological parties were in the field in 1939, seven of which were in British Columbia; four in Alberta; two in Saskatchewan; four in Manitoba; three in Ontario; four in Quebec; two in New Brunswick; two in Nova Scotia; one in Yukon; and four in the Northwest Territories. These parties were chiefly engaged in examining areas that appear promising for prospecting, and in obtaining information that will be of aid in the development of mineral deposits. During the year two memoirs, twelve preliminary geological papers, and twenty-six geological maps were published.

The Topographical Survey had parties working in British Columbia, Alberta, Saskatchewan, Ontario, Quebec, Nova Scotia, and Yukon. Thirty-five topographical maps were published.

GEOLOGICAL SURVEY

The Geological Survey promotes the discovery and development of Canada's mineral resources by means of geological studies, the results of which are presented to the public in the form of geological maps and reports. The nature and extent of the underground water resources of districts are also determined and other investigations are made to obtain information to serve as a basis for the classification of soils for agriculture and forestry. The geological maps published or in varying stages of progress are listed in the report of the Draughting and Reproducing Division. The reports published are listed in the section on publications.

Field Work

The field officers, in addition to preparing maps and reports for publication, have dealt with many requests for information and advice regarding mineral occurrences and allied subjects.

Field Work of Geological Survey, 1939

Geologist	Map-area	Latitude	Longitude	Remarks
		Yukon		
H. S. Bostock	Mayo	63°–64°	134°–136°	Continuation
		Northwest Territories		
J. F. Henderson	Gordon Lake	62° 30′–63°	113°–113° 30′	Completed
A. W. Jolliffe	Yellowknife River	62° 15′–62° 45′	114°–114° 30′	Continuation
C. S. Lord	Snare River	63°–64°	115°–117°	Completed
J. T. Wilson	Wray Lake	64°–65°	115°–117°	New project
		British Columbia		
E. D. Kindle	Hazelton	55°–56°	127°–128°	Continuation
	Hudson Bay Mountain	54° 45′–54° 55′	127° 10′–127° 30′	Continuation
A. H. Lang	Smithers	54°–55°	126°–127°	Completed
C. H. Crickmay	Tyaughton Lake	50° 45′–51° 05′	122° 40′–123° 05′	Completed
W. E. Cockfield	Ashcroft	50°–51°	120°–121°	New project
H. M. A. Rice	Hope (east half)	49°–50°	120°–121°	New project
W. E. Snow	Hope (west half)	49°–50°	121°–122°	Continuation
A. F. Buckham	Courtenay Bay	49° 30′–49° 45′	124° 45′–125° 15′	New project

Field Work of Geological Survey, 1939—Concluded

Geologist	Map-area	Latitude	Longitude	Remarks
		ALBERTA		
B. R. MacKay	Cardinal River	52° 45′–53°	116° 30′–116° 45′	Completed
	Blackstone	52° 30′–52° 45′	116° 15′–116° 30′	Completed
G. S. Hume	Jumpingpound (east half)	51°–51° 15′	114° 30′–114° 45′	Completed
	Turner Valley	50° 30′–50° 45′	114°–114° 30′	Completed
H. H. Beach	Moose Mountain	50° 45′–51°	114° 45′–115°	Completed
	Bragg Creek	50° 45′–51°	114° 30′–114° 45′	Completed
C. O. Hage	Wildcat Hills (east half)	51° 15′–51° 30′	114° 30′–114° 45′	Completed
		SASKATCHEWAN		
G. M. Furnival	Stony Rapids	59°–60°	104°–106°	Completed
C. C. Allen	Mari Lake	55°–55° 15′	102°–102° 15′	Completed
		MANITOBA		
T. L. Tanton	Schist Lake	54° 30′–54° 45′	101° 45′–102°	Completed
J. E. Armstrong	Wekusko	54° 45′–55°	99° 45′–100°	Completed
C. H. Stockwell	Beresford Lake	50° 35′–51° 05′	95° 10′–95° 30′	Completed
R. A. C. Brown	Southwestern Manitoba	.....	.....	Completed
		ONTARIO		
J. F. Caley	London	43°–44°	81°–82°	Completed
H. C. Cooke	Wanapitei	46° 30′–46° 45′	80° 45′–81°	Completed
A. E. Wilson	Cornwall	45°–45° 30′	74°–75°	Completed
		QUEBEC		
G. Shaw	Lake Evans	50°–51°	76°–77°	New project
M. E. Wilson	Rouyn township	.....	.....	New project
G. W. H. Norman	Varsan township	.....	.....	Continuation
J. W. Ambrose	Clericy	48° 15′–48° 30′	78° 45′–79°	Completed
		NEW BRUNSWICK		
F. J. Alcock	Dalhousie-Bathurst	47° 30′–48°	65° 30′–66° 30′	Completed
	Campbellton	47° 45′–48°	66° 30′–67°	Completed
J. S. Stewart	Petitcodiac	45° 45′–46°	65°–65° 30′	Completed
	Salisbury	46°–46° 15′	65°–65° 30′	Completed
		NOVA SCOTIA		
L. J. Weeks	Cobequid Bay	45° 15′–45° 30′	63° 30′–64°	Continuation
R. T. D. Wickenden	Springhill	45° 30′–45° 45′	64°–64° 30′	Completed

OFFICE WORK

The making of inventories of Canadian resources 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, 1938
Geology of Southern Alberta Plains
Malartic Area, Quebec
Mineral Resources, Hazelton and Smithers Areas, British Columbia
Palæozoic Geology of the Toronto-Hamilton Area, Ontario
Pictou Coal Field, Nova Scotia

Preliminary Reports

Snare River Area, Northwest Territories
Reindeer Lake and Spalding Lake Map-areas, Saskatchewan
Wildcat Hills Map-area, East Half, Alberta
The Structure and Oil Prospects of the Foothills of Alberta Between Highwood and Bow Rivers
The Lloydminster Gas and Oil Area, Alberta and Saskatchewan

Preliminary Editions of Maps

Nelson Area, east half, B.C. (lat. 49°-50°, long. 116°-117°)
Quyta Lake Area, N.W.T. (lat. 62° 45′-63°, long. 114°-114° 30′)
Northern Third of Prosperous Lake area, N.W.T. (lat. 62° 40′-62° 45′, long. 114°-114° 30′)
Southern Third of Fishing Lake area, N.W.T. (lat. 63°-63° 05′, long. 114°-114° 30′)
Fort Smith Area, N.W.T. (lat. 60°-61°, long. 110°-112°)
Gordon Lake South Area, N.W.T. (lat. 62° 30′-62° 45′, long. 113°-113° 30′)
Gordon Lake Area, N.W.T. (lat. 62° 45′-63°, long. 113°-113° 30′)
Jumpingpound Area, Alta. (lat. 51°-51° 15′, long. 114° 30′-114° 45′)
Fish Creek Area, Alta. (lat. 50° 45′-51°, long. 114° 15′-114° 30′)
LaPause Area, Que. (lat. 48° 15′-48° 30′, long. 78° 30′- 78° 45′)
Clericy Map-area, Que. (lat. 48° 15′-48° 30′, long. 78° 45′-79°)
Waconichi Map-area, Que. (lat. 50°-50° 15′, long. 74°-74° 15′)
Mechamego Lake, Que. (lat. 49° 45′-50°, long. 75° 15′-75° 30′)

Final Editions of Maps

Hedley, B.C., east half (lat. 49° 15′-49° 30′, long. 120°-120° 15′)
Hedley, B.C., west half (lat. 49° 15′-49° 30′, long. 120° 15′-120° 30′)
Nelson, B.C. (lat. 49°-50°, long. 116°-117°)
Fort Fraser, B.C., east half (lat. 54°-55°, long. 124°-125°)
Fort Fraser, B.C., west half (lat. 54°-55°, long. 125°-126°)
Okanagan Falls, B.C. (lat. 49° 15′-49° 30′, long. 119° 30′-119° 45′)
Olalla, B.C. (lat. 49° 15′-49° 30′, long. 119° 45′-120°)
Fort Smith, N.W.T. (lat. 60°-61°, long. 110°-112°)
Midnapore, Alta. (lat. 50° 45′-51°, long. 114°-114° 15′)
Clearwater Lake, Sask., east half (lat. 57°-58°, long. 108°-109°)
Cree Lake, Sask., east half (lat. 57°-58°, long. 106°-107°)
Cree Lake, Sask., west half (lat. 57°-58°, long. 107°-108°)
Mudjatik Lake, Sask., east half (lat. 56°-57°, long. 106°-107°)
Mudjatik Lake, Sask., west half (lat. 56°-57°, long. 107°-108°)
MacKay Lake, Sask. (lat. 55° 15′-55° 30′, long. 104° 45′-105°)
Spalding Lake, Sask. (lat. 57°-58°, long. 103°-104°)
Reindeer Lake, Sask. (lat. 57°-58°, long. 102°-103°)
Etomami, Sask. (lat. 52°-53°, long. 102°-103°)
Swan River, Man. and Sask. (lat. 52°-53°, long. 101°-103°)
Toronto-Hamilton, Ont. (lat. 42° 45′-44°, long. 79°-80°)
Opémisca Area, Que., east half (lat. 49° 45′-50°, long. 79° 30′-79° 45′)
Opémisca Area, Que., west half (lat. 49° 45′-50°, long. 79° 45′-80°)
Waconichi Lake, Que. (lat. 50°-50° 15′, long. 74°-74° 15′)
Bousquet-Joanne Area, Que.
Clericy Area, Que., east half (lat. 48° 15′-48° 30′, long. 78° 30′-78° 45′)
Clericy Area, Que., west half (lat. 48° 15′-48° 30′, long. 78° 45′-79°
Hillsborough, N.B. (lat. 45° 45′-46°, long. 64° 30′-65°)
Albert, N.B. (lat. 45° 30′-45° 45′, long. 64° 30′-65°)
Moncton, N.B. (lat. 46°-46° 15′, long. 64° 30′-65°)
Campbellton, N.B. (lat. 47° 45′-48°, long. 66° 30′-66° 45′)
Matapedia, N.B. (lat. 47° 45′-48°, long. 66° 45′-67°)
Salisbury, N.B. (lat. 46°-46° 15°, long. 67°-67° 15′)
Alward Brook, N.B. (lat. 46°-46° 15′, long. 67° 15′-67° 30′)
Petitcodiac, N.B., east half (lat. 45° 45′-46°, long. 65°-65° 15′)
Petitcodiac, N.B., west half (lat. 45° 45′-46°, long. 65° 15′-65° 30′)
Jacquet River, N.B. (lat. 47° 30′-48°, long. 66°-66° 30′)
Tetagouche River, N.B. (lat. 47° 30′-48°, long. 65° 30′-66°)
Pictou Coal Field, N.S.

Palæontological Section

The following presentations made to the Geological Survey were added to the palæontological collections:

D. A. Nichols, Topographical Survey: Ordovician and Silurian fossils from Somerset Island, Arctic Canada.

James Sallows, Medicine Hat, Alberta: fossils from Upper Cretaceous strata.

Mrs. Jennie V. Sutherland, Michichi, Alberta: fossil oyster shell containing quartz crystals.

Mineralogical Section

About 7,000 specimens of minerals and rocks from various parts of Canada were examined and reported upon; in addition to which about 3,000 specimens submitted by visitors were reported on verbally. Various mineralogical and chemical investigations were also made.

A total of 1,209 educational collections of minerals and rocks, consisting in all of 39,760 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. C. S. Evans, Union Gas Company of Canada, Chatham, Ont.: fragment of an 88-pound meteorite that fell in Chatham district some time in July 1939 on farm of Dan Solomon near Dresden. Bought by Dr. Luke Smith, Chatham.

H. Mayrand, LaMotte, Abitibi, P.Q.: bismuthinite and molybdenite in quartz from LaMotte township, lots 3-6, range II, Abitibi, P.Q.

N. B. Davis, Ottawa: cancrinite from pegmatite near Bancroft, Ont.; albite, microcline, and quartz, from Pednaud Feldspar mine, Buckingham township, P.Q.; uraninite and gummite from Spruce Pines, North Carolina, U.S.A.; cryolite and hackmanite from lot 9, con. XIV, Duncannon tp., Hastings co., Ont.

Consolidated Mining and Smelting Company: several specimens of cinnabar ore from the Pinchi Lake property, north of Fort St. James, B.C.

Victor Dolmage: a large specimen of chloropal from Hedley, B.C.

C. L. Hershman, Bear Exploration and Radium Company, Limited: a large specimen of gold ore from the Giant group, Yellowknife, Northwest Territories.

L. E. Djingheuzian, Siscoe Gold Mines, Limited: a large specimen of gold ore from the Siscoe mine, Quebec.

Water Supply and Borings Section

Inquiries from all parts of Canada for information on ground water conditions were dealt with.

The section continued to be engaged largely in the preparation for examination of rock cuttings from oil, gas, and water wells, the number of samples totalling 59,137. The 39,231 samples from 112 wells in Alberta were received through the courtesy of the Petroleum and Natural Gas Division, Department of Lands and Mines, Alberta; the 787 samples from 12 wells in Saskatchewan through the courtesy of the Supervisor of Mines, Department of Natural Resources, Saskatchewan; the 73 samples from 2 wells in Manitoba through the courtesy of the Director of Mines, Department of Mines and Natural Resources, Manitoba; the 18,702 samples from 163 wells in Ontario through the courtesy of the Natural Gas Commissioner, Department of Mines, Ontario; and the 166 samples from one well in Quebec through the courtesy of the Director of the Bureau of Mines, Department of Mines and Fisheries, Quebec. From a well near Fort Norman 178 samples were received.

Records of 138 wells drilled for water in Saskatchewan were received through the courtesy of Professor F. H. Edmunds, University of Saskatchewan.

British Columbia Office

There were 3,734 visitors who registered at the office and a large number of inquiries were handled by mail and by telephone. A total of 4,173 reports and 1,923 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 resources.

Field work for ground mapping and control for mapping from the air was carried out in British Columbia, Alberta, Saskatchewan, Quebec, Ontario, Nova Scotia, and Yukon.

Forty-three topographical and geographical base maps were transmitted to the Draughting and Reproducing Division. Forty-six geological and topographical maps were prepared for preliminary editions and ten special map manuscripts were prepared for the use of the Geological Survey. At the end of the year, 180 maps were in hand. Investigations in physical geography and the work in connection with the Geographic Board were carried on as usual. A list of the topographical maps published is found under Draughting and Reproducing Division, page 32.

Brief reports of the work of the several sections of the Topographical Survey follow.

Topographical Mapping Section

Field Work of Topographical Mapping Section, 1939[1]

Topographer	Map-area	Latitude	Longitude	Remarks
		Yukon		
A. C. Tuttle.....	McQuesten.....	63°–64°	136°–138°	1 in. to 4 mi.
		British Columbia		
C. H. Smith.....	Zeballos.....	49° 45′–50°	126° 30′–127°	1 in. to. 1 mi.
	Tahsis Canal.....			
H. A. S. West....	Nelson.....	49° 15′–49° 30′	117° 15′–117° 30′	1 in. to 1 mi.
		Alberta		
J. A. Macdonald..	Turner Valley.....	50° 30′–50° 45′	114°–114° 30′	1 in. to 1 mi.
	Black Diamond....			
F. P. DuVernet...	Wapiabi Creek.....	52° 30′–52° 45′	116°–116° 30′	1 in. to 1 mi.
	Wawa Creek.....			
	George Creek.....	52° 30′–52° 45′	116° 30′–116° 45′	1 in. to 1 mi.
K. G. Francis.....	Jasper Park.....	.....	.....	1 in. to 4 mi.

[1] All projects completed except Nelson Map-area.

Field Work of Topographical Mapping Section, 1939—Continued

Topographer	Map-area	Latitude	Longitude	Remarks
		QUEBEC		
A. M. Floyd.....	Ste. Félicité..... Grosses Roches..... St. Vianney..... Cuoq.....	48° 30′–49°	67°–67° 30′	1 in. to 1 mi.
		NOVA SCOTIA		
R. J. Parlee.....	Bass River..... Londonderry.....	45° 15′–45° 30′	63° 30′–64°	1 in. to 1 mi.

J. W. Spence supervised the field work of Messrs. Parlee and Floyd and also the control work of R. F. Dore reported under the Air Survey Section.

Manuscript Maps Cleared to Map Compilation Section

Tatlatui, B.C.—94 D, west half
Wapiabi, Alta.—83 C/9, west half
George Creek, Alta.—83 C/10, east half
Moose Mountain, Alta.—82 J/15, west half
Ste. Félicité, Que.—22 B/14, west half
Grosses Roches, Que.—22 B/14, east half
Bass River, N.S.—11 E/5, west half
Londonderry, N.S.—11 E/5, east half

The preliminary work was completed on seven other maps, which were laid aside for future contouring. Eleven topographical maps were in various stages of completion on March 31.

AIR SURVEY SECTION

Field Work for Air Mapping Projects[1]

Topographer	Map-area	Latitude	Longitude	Remarks
		ALBERTA		
J. A. Macdonald..	Langford Creek.... Martha Creek..... Cowley..... Beaver Mines.....	49° 22·5′–50° 15′	114°–114° 15′	1 in. to 1 mi.
		SASKATCHEWAN		
R. W. Clark.....	Low Lake..... Wiley Lake..... Stony Rapids.....	59° 15′–59° 30′	105° 45′–107°	1 in. to 1 mi.
		ONTARIO		
E. S. Fry.....	Round Lake..... Aylen Lake..... Cartier Lake..... Grand Lake.....	45° 30′–46°	77° 30′–78°	1 in. to 1 mi.

[1] All projects completed.

Field Work for Air Mapping Projects—Continued

Topographer	Map-area	Latitude	Longitude	Remarks
	QUEBEC			
S. H. de Jong	Sauterelle Lake Bark Lake Wolf Lake Lac Larouche Cabonga Kamatose Lake Kachakaki Lac Travers	47°–47° 30′	76°–77°	1 in. to 1 mi.
A. M. Perry C. M. Duncan	Nishkotea Lake Ward Lake Labrador Lake Crutch Lake Perch Lake Kawasachuan Lake Birch Lake Lac la Loche Opikwan Anwatan Gaotonaga Lake Otonabi Lake Sabourin Lake Marmette Lake Denain Lake Marrias Lake	47°–48°	77°–78°	1 in. to 1 mi.
John Carrol	Parts of Varsan, Dubuisson, Malartic, and Fournier townships	.....	.....	1 in. to 1,500 ft.
R. F. Dore	S.½ Cuoq Causapscal Amqui Routhierville Milnikek River	48°–48° 37·5′	67°–67° 30′	1 in. to 1 mi.

Map Compilations from Air Photography

Following is a list of manuscript maps completed during the fiscal year in the Air Survey Section and cleared to the Map Compilation Section. The name, number, publication scale, area of sheet in square miles, type of air photography—oblique or vertical—employed are given in each case:

Name	Number	Photography Oblique or Vertical	Scale	Area Square Miles
	NORTHWEST TERRITORIES			
Carp Lakes	NW. ¼, 85 P/NW	Oblique	1 inch=4 miles	1,062
	SW. ¼, 85 P/SW	"	"	1,082
	NE. ¼, 85 P/NE	"	"	1,062
	SE. ¼, 85 P/SE	"	"	1,082
MacKay Lake	NW. ¼, 75 M/NW	"	"	1,062
	SW. ¼, 75 M/SW	"	"	1,082
	NE. ¼, 75 M/NE	"	"	1,062
	SE. ¼, 75 M/SE	"	"	1,082

Map Compilations from Air Photography—Continued

Name	Number	Photography Oblique or Vertical	Scale	Area Square Miles
NORTHWEST TERRITORIES—*Contd.*				
Indin Lake	NW. ¼, 86 B/NW	Oblique	1 inch = 4 miles	1,025
	SW. ¼, 86 B/SW	"	"	1,044
	NE. ¼, 86 B/NE	"	"	1,025
	SE. ¼, 86 B/SE	"	"	1,044
Fort Enterprise	NW. ¼, 86 A/NW	"	"	1,025
	SW. ¼, 86 A/SW	"	"	1,044
	NE. ¼, 86 A/NE	"	"	1,025
	SE. ¼, 86 A/SE	"	"	1,044
Lac de Gras	NW. ¼, 76 D/NW	"	"	1,025
	SW. ¼, 76 D/SW	"	"	1,044
	NE. ¼, 76 D/NE	"	"	1,025
	SE. ¼, 76 D/SE	"	"	1,044
Resolution	NW. ¼, 85 H/NW	"	"	1,137
	SW. ¼, 85 H/SW	"	"	1,155
	NE. ¼, 85 H/NE	"	"	1,137
	SE. ¼, 85 H/SE	"	"	1,155
Gordon Lake	85 P/3	Vertical	1 inch = 1 mile	271
Muir Lake	85 P/6	"	"	269
ALBERTA				
Grave Flats	Part of 83 C/15, W. ½	Vertical	1 mile = 1 inch	85
Blackstone River	Part of 83 C/9 and 83 C/10, E. ½	"	"	160
Jasper Park Area, Strip plots along Sunwapta and Athabaska Rivers in map-sheets	83 C/5 and 83 C/6	"		190
SASKATCHEWAN				
Forget Lake	74 N/9, E. ½	Vertical	1 inch = 1 mile	151
Nevins Lake	74 O/12, W. ½	"	"	152
MANITOBA				
Manigotagan Lake	Parts of 52 L/13 and 52 M/4	Vertical	1 inch = 1 mile	100
ONTARIO				
Fort Hope, W. ½	42 M/NW	Oblique	1 inch = 4 miles	1,483
	42 M/SW			1,500
Martin Falls, E. ½	42 M/NE	"	"	1,483
	42 M/SE			1,500
Burwash	41 I/SE., W. ½	Vertical	"	827
ONTARIO AND QUEBEC				
Chalk River	31 K/3, W. ½	Vertical	1 mile = 1 inch	207
Point Alexander Stonecliffe	31 K/4, E. ½	"	"	207
	31 K/4, W. ½	"	"	207

Map Compilations from Air Photography—Concluded

Name	Number	Photography Oblique or Vertical	Scale	Area Square Miles
		QUEBEC		
Lac Arcand	31 I/NW., E. ½	Vertical	1 inch=2 miles	820
St. Michel	31 I/NW., W. ½	"	"	820
McGillivray Lake	31 K/3, E. ½	"	1 inch=1 mile	207
Sucker Lake	31 K/5, W. ½	"	"	206
Varsan-Dubuisson	N. ½, parts of 32 C/4, C/5	"	1 inch=1,000 ft.	50
	S. ½, parts of 32 D/1, D/8	"		50
Cuoq	22 B/11, E. ½	"	1 inch=1 mile	99
		NEW BRUNSWICK		
Fractional 22 B/2 lying south of Chaleur Bay		Vertical	1 inch=1 mile	12
		NOVA SCOTIA		
Middle Musquodoboit	11 E/3, E. ½	Vertical	1 inch=1 mile	211
Shubenacadie	11 E/3, W. ½	"	"	211
Kennetcook	11 E/4, E. ½	"	"	211
Clarksville	11 E/4, W. ½	"	"	211
Bass River	11 E/5, W. ½ (Fract.)	"	"	130
Wentworth	11 E/12, E. ½	"	"	209
Springhill	21 H/9, E. ½	"	"	209
River Hebert	21 H/9, W. ½	"	"	209

In addition, 66 map projects were actively in hand at the end of the fiscal year.

Technical Instructions for Air Mapping Photography

Technical instructions were prepared by this Section for a full season's program of oblique and vertical air photographic operations to be carried out by the Royal Canadian Air Force throughout Canada. Because of the war, however, this program was drastically curtailed. Vertical air photography for use in mapping in the Maritime area, as outlined in the program, was, however, obtained in the early part of the season by the R.C.A.F., as in that area they considered that maps were of vital importance to them.

This Maritime photography covers areas totalling 9,392 square miles, comprised of:

2,980 square miles in Quebec
843 " " in northeastern New Brunswick
5,669 " " in Nova Scotia and Cape Breton

To complete the photography of the map-sheets affected some additional flights are required.

To supplement the part of the photographic program carried out by the R.C.A.F., instructions were prepared for vertical air photography to be obtained under contract covering the following four areas, totalling 4,071 square miles:

Quebec—100 square miles in Varsan-Dubuisson area, being part of map-sheets 32 C/4, C/5, and 32 D/1 and D/8.

1,640 square miles in Montagne-Tremblant Park area, being map-sheets 31 J/9, J/10, J/15, and J/16.

Ontario and Quebec—1,655 square miles in Algonquin-Mattawa area, being map-sheets 31 L/1, L/2, L/7, and L/8.

Alberta—676 square miles in Oldman River area, being E. ½ of 1-mile map-sheets, 82 J/1, 82 G/16, and G/9, and NE. ¼ 82 G/8.

All of the vertical air photographs obtained, as outlined above, were examined and indexed in this Section, and the index information was also made available to the Air Photographic Library.

Map Compilation Section

Topographical and Geographical Base Maps Transmitted to the Draughting and Reproducing Division

No.	Name	Sheet No.	Publication Scale
	Northwest Territories		
1	Gordon Lake South	85 I/14	1 inch to 1 mile
2	Gordon Lake	85 P/3	1 inch to 1 mile
3	Hanbury	75 P	1 inch to 4 miles
4	Leith	86 E	1 inch to 4 miles
5	Marian River	85 N	1 inch to 4 miles
6	Muir Lake	85 P/6	1 inch to 1 mile
7	South Nahanni River	Parts of 95 L/3 and 4, and 95 E/13 and 14	1 inch to 1 mile
	Yukon Territory		
8	Mayo	105 M	1 inch to 4 miles
	British Columbia		
9	McConnell Creek	94 E, E.½	1 inch to 4 miles
10	Spanish Creek	93 A/11, W.½	1 inch to 1 mile
	Alberta		
11	Fish Creek	82 J/16, W.½	1 inch to 1 mile
12	Midnapore	82 J/16, E. ½	1 inch to 1 mile
13	Pembina Forks	83 C/15, E. ½	1 inch to 1 mile
14	Wapiabi Creek	83 C/9, W. ½	1 inch to 1 mile
	Saskatchewan		
15	Crackingstone	74 N/7	1 inch to 1 mile
16	Etomami River	63 D, E. ½	1 inch to 4 miles
17	Forget Lake	74 N/9, E. ½	1 inch to 1 mile
18	Goldfields	74 N/8	1 inch to 1 mile
19	MacKay Lake	73 P/7, W. ½	1 inch to 1 mile
20	Mackenzie Lake	64 E, E. ½	1 inch to 4 miles
21	Spalding Lake	64 E, W. ½	1 inch to 4 miles
22	Schist Lake	63 K/12, W. ½	1 inch to 1 mile
23	Upper Clearwater River	74 F, E. ½	1 inch to 4 miles

Topographical and Geographical Base Maps Transmitted to the Draughting and Reproducing Division—Conc.

No.	Name	Sheet No.	Publication Scale
	MANITOBA AND SASKATCHEWAN		
24	Swan River	63 C, W. ½	1 inch to 4 miles
	MANITOBA		
25	Elin Elon	63 K/13, W. ½	1 inch to 1 mile
	ONTARIO		
26	Capreol	41 I/NE., W. ½	1 inch to 2 miles
27	Stokely Creek	41 K/16, W. ½	1 inch to 1 mile
28	Toronto-Hamilton	30 M, W. ½ and part of 30 L, W. ½	1 inch to 4 miles
29	Verner	41 I/SE., E. ½	1 inch to 2 miles
	QUEBEC		
30	Bousquet-Joannes area—Sheet No. 3	Parts of 32 D/2 and 7	1 inch to 1,500 feet
31	Bousquet-Joannes area—Sheet No. 4	Parts of 32 D/2 and 7	1 inch to 1,500 feet
32	Clericy	32 D/7, W. ½	1 inch to 1 mile
33	Mishagomish Lake	32 K, E. ½	1 inch to 4 miles
34	Soskumika Lake	32 K, W. ½	1 inch to 4 miles
	NEW BRUNSWICK		
35	Albert	21 H/10, E. ½	1 inch to 1 mile
36	Alma	21 H/10, W. ½	1 inch to 1 mile
37	Campbellton	21 O/15, E. ½ and part of 22 B/2, E. ½	1 inch to 1 mile
38	Matapedia	21 O/15, W. ½	1 inch to 1 mile
39	New Brunswick, NE. ¼		1 inch to 8 miles
40	New Brunswick, NW. ¼		1 inch to 8 miles
41	New Brunswick, SE. ¼		1 inch to 8 miles
42	New Brunswick, SW. ¼		1 inch to 8 miles
43	Saint John	Parts of 21 G/1 and 8	1 inch to 1 mile

Preliminary Geological and Topographical Maps Prepared

	NORTHWEST TERRITORIES		
1	Camsell River, NE. ¼	86 F, NE	1 inch to 2 miles
2	Camsell River, NW. ¼	86 F, NW	1 inch to 2 miles
3	Camsell River, SE. ¼	86 F, SE	1 inch to 2 miles
4	Camsell River, SW. ¼	86 F, SW	1 inch to 2 miles
5	Fishing Lake	85 O/1	1 inch to ½ mile
6	Fort Smith, E. ½	75 D, E. ½	1 inch to 2 miles
7	Fort Smith, W. ½	75 D, W. ½	1 inch to 2 miles
8	Gordon Lake (Topo.)	85 P/3	1 inch to 1 mile
9	Gordon Lake (Geol.)	85 P/3	1 inch to ½ mile
10	Gordon Lake South (Topo.)	85 I/14	1 inch to 1 mile
11	Gordon Lake South (Geol.)	85 I/14	1 inch to ½ mile
12	Muir Lake	85 P/6	1 inch to 1 mile
13	Prosperous Lake (northern third)	Part of 85 J/9	1 inch to ½ mile
14	Snare River	85 O, W. ½ and 85 N, E. ½	1 inch to 2 miles
15	Quyta Lake	85 J/16	1 inch to ½ mile
16	Wecho River	85 O	1 inch to 4 miles

Preliminary Geographical and Topographical Maps Prepared—Conc.

No.	Name	Sheet No.	Publication Scale
	British Columbia		
17	Nelson, E. ½	82 F, E. ½	1 inch to 2 miles
	Alberta		
18	Fish Creek	82 J/16, W. ½	1 inch to ½ mile
19	Wildcat Hills, E. ½	82 O/7, E. ½	1 inch to ½ mile
20	Pekisko Hills area	Part of 82 J/8	1 inch to 1,320 feet
21	Moose Mountain	82 J/15, W. ½	1 inch to ½ mile
	Saskatchewan		
22	Crackingstone, Map A	74 N/7, E. ½	1 inch to 1 mile
23	Crackingstone, Map B	74 N/7, W. ½	1 inch to 1 mile
24	MacKay Lake	73 P/7, W. ½	1 inch to ½ mile
25	Nevins Lake, Map B	Part of 74 O/5	1 inch to 1 mile
26	Reindeer Lake	64 E, E. ½	1 inch to 2 miles
27	Spalding Lake	64 E, W. ½	1 inch to 2 miles
	Manitoba and Saskatchewan		
28	Schist Lake	63 K/12, W. ½	1 inch to 1 mile
	Manitoba		
29	Mikanagan Lake	63 K/13, E. ½	1 inch to 1 mile
	Quebec		
30	Clericy	32 D/7, W. ½	1 inch to ½ mile
31	Cuoq	22 B/11, E. ½	1 inch to 1 mile
32	Grosses Roches	22 B/14, E. ½	1 inch to 1 mile
33	Lac Charette	32 C/NE., E. ½	1 inch to 2 miles
34	Lac au Sorcier	31 I/NW., E. ½	1 inch to 2 miles
35	LaPause	32 D/7, E. ½	1 inch to ½ mile
36	Mechamego	32 G/14, W. ½	1 inch to ½ mile
37	Ste. Félicité	22 B/14, W. ½	1 inch to 1 mile
38	St. Michel	31 I/NW., W. ½	1 inch to 2 miles
39	Wakonichi	32 J/1, E. ½	1 inch to ½ mile
	New Brunswick		
40	Alma	21 H/10, W. ½	1 inch to 1 mile
	Nova Scotia		
41	Bass River	11 E/5, W. ½	1 inch to 1 mile
42	Clarksville	11 E/4, W. ½	1 inch to 1 mile
43	Kennetcook	11 E/4, E. ½	1 inch to 1 mile
44	Londonderry	11 E/5, E. ½	1 inch to 1 mile
45	Middle Musquodoboit	11 E/3, E. ½	1 inch to 1 mile
46	Shubenacadie	11 E/3, W. ½	1 inch to 1 mile

In addition, 67 maps were in various stages of progress at the end of the year. Thirty-two preliminary topographical and geological maps were also in hand. Eleven map manuscripts were prepared and submitted to the Geological Survey, and 148 map projections were prepared for various purposes.

To meet the demands of the Geological Survey for provisional topographical bases for field and office use, and for the general use of the mineral industry, tracings were prepared from 66 map compilations from which true-scale prints were supplied.

Six diagrams and tabulations were prepared in connection with administration.

Physical Geography

D. A. Nichols spent the field season in the Eastern Arctic gathering information for a report on the Northwest Territories and obtaining further information regarding the geography and land movements of northeastern Canada.

In the office information was provided in answer to queries on physiographic and geographic subjects, the report of the Northwest Territories was assembled, and diagrams and charts for its illustrations were prepared.

A flat model of Canada on a scale of 125 miles to 1 inch is under construction to illustrate the general relief of Canada and its submarine connections to Asia and Scandinavia. This will be used for physiographic studies, and copies of it will be available, by purchase, for colleges and schools.

Work has also been commenced on assembling information for a glacial map of Canada, in conjunction with members of the staff of the Geological Survey.

Geographic Board of Canada

J. H. Corry, Secretary, reports as follows:

The Geographic Board of Canada was created by Order in Council of December 18, 1897. The order 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, and at present, with one exception, all the provinces are represented.

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

The present personnel of the Board is as follows: Chairman, W. H. Boyd; British Columbia, F. C. Green vice G. G. Aitken; Alberta, H. P. Brownlee; Saskatchewan, J. R. Hill; Manitoba, H. E. Beresford vice S. E. McColl, deceased; Ontario, C. H. Fullerton; New Brunswick, A. S. McFarlane; Nova Scotia, vacant through the death of Harry Piers; Prince Edward Island, Hon. Bradford W. LePage; Dominion Representatives, F. C. C. Lynch, G. A. Young, F. H. Peters, A. Dickison, N. J. Ogilvie, and D. L. McKeand, Department of Mines and Resources; J. E. Lyon, Department of National Defence; E. E. Gagnon, Department of Transport; J. H. Corry, Secretary.

During the past year numerous controversial questions relating to the orthography of Canadian place names have been investigated and ruled upon by the Board and some thousands of geographical place names have been carefully considered and passed as satisfactory for some seventy map-sheets; in addition to the foregoing, numerous inquiries have been received and answered, from local, foreign, and departmental sources, regarding the location of geographical features in Canada; the authentic names for the same and also the history and origin 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 development relating to mineral resources; 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 important part played by aerial photography in the development of our natural resources was evidenced during the past year by the continued use being made of aerial photographs by the different agencies. Representatives of mining companies, pulp and timber operators, prospectors, geologists, etc., visited the library to examine aerial photographs covering areas in which they were interested. These examinations and correspondence resulted in the forwarding to the Photographic Section, Department of National Defence, of 605 requisitions involving the purchase of 46,850 prints of aerial negatives, an increase of some 8,000 over the number purchased during the previous year.

Additions to the library collection were 29,400 new photographs, bringing the total now available for examination to about 814,250 prints. These cover areas of approximately 865,000 square miles, well distributed over the Dominion. Index maps showing the areas in the different provinces covered by these photographs are supplied by the library on request. In addition, some 10,500 plotting prints were received in the library for the use of the Topographical Division of this Bureau.

Seven employees of the Department of Agriculture were engaged in the preparation of municipality folders of aerial photographs for the Water Development and Economic Branches of the Prairie Farm Rehabilitation Act. Supervision of this work and considerable assistance was provided by the library staff. During the year over 22,600 vertical photographs were indexed, gridded, and assembled in municipality folders. These covered 62 municipalities in Saskatchewan and 31 municipalities and 10 improvement districts in Alberta. Upon completion they were forwarded to P.F.R.A. officials in Saskatoon and Edmonton to assist them in their field examination of the areas involved.

Engineering problems studied by aerial methods during the year included preliminary investigations concerning the location of a road in northern Ontario, and in connection with a proposed reservoir site at Buffalo Lake, Alberta. The staff also assisted visitors to the library in the interpretation of air photographs for a wide variety of uses.

Photographic Section

Following is a summary of the work:

Contact prints, 4 by 5 to 36 by 48	13,592
Bromide enlargements, 4 by 5 to 40 by 72	4,821
Exposures developed, 1 by 1½ to 5 by 7	6,154
Dry plate negatives, 4 by 5 to 20 by 24	653
Wet plate negatives, 8 by 10 to 24 by 30	140
Zinc plates etched, 11 by 14 to 24 by 30	4
Lantern slides, 3¼ by 4	536
Photos and maps mounted	3,513
Total	29,413

Library

The Library now has on its shelves upwards of 80,000 volumes. It also maintains large collections of valuable pamphlets, maps and charts, photographs,

and lantern slides, which, though primarily for reference and research by the staff of geologists, topographers, and museum officials, are being increasingly used by students and scientific workers throughout Canada.

Accessions during the year include:

Books (by purchase)	145
Books (complete unbound volumes by purchase)	217
Books (by gift)	112
Books (complete unbound volumes by gift or exchange)	608
Pamphlets and reprints	327
Canadian Government documents	979
British and Foreign Government documents	1,362
British and Foreign periodicals	2,028
Canadian periodicals	443
Scientific institutions, bulletins, proceedings, transactions (by exchange)	1,833
Total	8,054

The map collection was increased by 406 new maps and charts and the lantern slide collection by 221, bringing the total number of slides to 6,116. Maps and lantern slides are fully catalogued. Over 990 new photographs were classified and filed. Recorded loans amounted to 9,216, an increase of 1,345 over the preceding year. Inter-library loans amounted to 460 and 224 volumes were borrowed from other libraries. Four hundred and eight maps were borrowed besides those consulted in the library and 1,019 slides were loaned to members of the staff and to educational institutions.

Five hundred and thirty-four volumes were bound. Cards added to the catalogue numbered 5,587, of which 150 were bibliographical and 41 biographical entries. The analysing of important monographs and other significant material added 904 new titles to the catalogue.

The library staff prepared much bibliographic and other information in response to daily requests from the scientific staff and from other inquirers both in Ottawa and at a distance. Special bibliographical service is furnished by the bi-monthly issue of mimeographed Lists of Accessions giving classified lists of books and periodical articles received. The work of the library involved 1,160 items of correspondence.

By exchange or gift, 84 new periodicals and serials were added to the list currently received. Many valuable gifts of books and manuscripts were received from scientific institutions throughout the world and from scientists and research workers in Canada.

Mechanical Section

This section provides the Bureau and the National Museum with blueprinting, 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, in the latter part of the year, of plans and drawings for war purposes were important features of the year's activities, the total output of 95,069 prints requiring 522,193 square feet of paper. Photostat printing totalled 8,412 sheets.

In the instrument section, a feature of the year was the manufacture of several new instruments for the Topographical Survey. One of these involved the accurate graduation of large circles, which was successfully carried out with equipment extemporized for the purpose.

Geological Information and Distribution

During the year 84,174 publications of the Bureau of Geology and Topography and the National Museum, exclusive of French editions, were distributed. Of these, 10,839 were sent to addresses on the regular mailing lists, and 73,335 were distributed in compliance with written and personal requests for named publications, or requests for general or specific information.

DRAUGHTING AND REPRODUCING DIVISION

Maps Published April 1, 1939, to March 31, 1940

Publication Number	Title	Remarks
	NORTHWEST TERRITORIES	
498A	Quyta Lake, District of Mackenzie; scale, 1 inch to 1 mile	Topography. For separate distribution.
499A	Prosperous Lake, District of Mackenzie; scale, 1 inch to 1 mile	Topography. For separate distribution.
500A	Yellowknife Bay, District of Mackenzie; scale, 1 inch to 1 mile	Topography. For separate distribution.
525A	Taltson Lake, District of Mackenzie; scale, 1 inch to 4 miles	Geology. For separate distribution.
526A	Nonacho Lake, District of Mackenzie; scale, 1 inch to 4 miles	Geology. For separate distribution.
551A	Nonacho Lake, District of Mackenzie; scale, 1 inch to 4 miles	Topography. For separate distribution.
	BRITISH COLUMBIA	
546A	Tyaughton Lake, Lillooet District; scale, 1 inch to 1 mile	Topography. For separate distribution.
	ALBERTA	
501A	Ribstone Creek; scale, 1 inch to 4 miles	Geology. For separate distribution.
502A	Hardisty; scale, 1 inch to 4 miles	Geology. For separate distribution.
503A	Stettler; scale, 1 inch to 4 miles	Geology. For separate distribution.
504A	Red Deer; scale, 1 inch to 4 miles	Geology. For separate distribution.
505A	Tofield; scale, 1 inch to 4 miles	Geology. For separate distribution.
506A	Edmonton; scale, 1 inch to 4 miles	Geology. For separate distribution.
540A	Bragg Creek; scale, 1 inch to 1 mile	Topography. For separate distribution.
541A	Stimson Creek; scale, 1 inch to 1 mile	Topography. For separate distribution.
542A	Pekisko Creek; scale, 1 inch to 1 mile	Topography. For separate distribution.
544A	Morley; scale, 1 inch to 1 mile	Topography. For separate distribution.
548A	Fallentimber (east half), west of fifth meridian; scale, 1 inch to 1 mile	Geology. For separate distribution.
549A	Fallentimber (west half), west of fifth meridian; scale, 1 inch to 1 mile	Geology. For separate distribution.
	SASKATCHEWAN	
527A	Wapus Lake; scale, 1 inch to 4 miles	Geology. For separate distribution.
528A	Oliver Lake; scale, 1 inch to 4 miles	Geology. For separate distribution.

Maps Published April 1, 1939, to March 31, 1940—Continued

Publication Number	Title	Remarks
	MANITOBA	
535A	Sheet 1, Halfway Lake-Beresford Lake (in three sheets); scale, 1 inch to 1,000 feet	Geology. For Memoir 219 by C. H. Stockwell and C. S. Lord, and separate distribution.
536A	Sheet 2, Halfway Lake-Beresford Lake (in three sheets); scale, 1 inch to 1,000 feet	Geology. For Memoir 219 by C. H. Stockwell and C. S. Lord, and separate distribution.
537A	Sheet 3, Halfway Lake-Beresford Lake (in three sheets); scale, 1 inch to 1,000 feet	Geology. For Memoir 219 by C. H. Stockwell and C. S. Lord, and separate distribution.
	ONTARIO	
266A	Kenora sheet; scale, 1 inch to 8 miles	Geology (second edition). For separate distribution.
493A	North Spirit Lake, Kenora district, Patricia portion; scale, 1 inch to 4 miles	Topography. For separate distribution.
494A	McInnes Lake, Kenora district, Patricia portion; scale, 1 inch to 4 miles	Topography. For separate distribution.
534A	Quetico (west half), Rainy River district; scale, 1 inch to 4 miles	Geology. For separate distribution.
	ONTARIO AND QUEBEC	
413A	Ottawa sheet (east half), Carleton and Hull counties; scale, 1 inch to 1 mile	Geology. For memoir, also French edition, and separate distribution.
414A	Ottawa sheet (west half), Carleton and Hull counties; scale, 1 inch to 1 mile	Geology. For memoir, also French edition, and separate distribution.
	QUEBEC	
453A	Rouyn area, Rouyn township, Témiscamingue county; scale, 1 inch to 800 feet	Geology. For memoir by M. E. Wilson, also French edition, and separate distribution.
484A	Mistawak Lake, Abitibi territory and Abitibi county; scale, 1 inch to 2 miles	Topography. For separate distribution.
514A	Michwacho Lake, Abitibi territory; scale, 1 inch to 1 mile	Topography. For separate distribution.
529A	Duverny (east half), Abitibi county; scale, 1 inch to 1 mile	Geology. For separate distribution.
530A	Duverny (west half), Abitibi county; scale, 1 inch to 1 mile	Geology. For separate distribution.
533A	Mistawak Lake, Abitibi territory and Abitibi county; scale, 1 inch to 2 miles	Geology. For separate distribution.
543A	Rawdon, Joliette, Montcalm, and Berthier counties; scale, 1 inch to 2 miles	Topography. For separate distribution.

Maps Published April 1, 1939, to March 31, 1940—Continued

Publication Number	Title	Remarks
	QUEBEC—*Concluded*	
545A	Mechamego Lake, Abitibi territory; scale, 1 inch to 1 mile	Topography. For separate distribution.
550A	Gale River, Abitibi territory and Abitibi county; scale, 1 inch to 2 miles	Topography. For separate distribution.
552A	Rochebaucourt, Abitibi county; scale, 1 inch to 1 mile	Topography. For separate distribution.
	NEW BRUNSWICK AND QUEBEC	
259A	New Brunswick-Gaspe sheet; scale, 1 inch to 8 miles	Geology. (Reprint of first edition issued in 1931.) For separate distribution.
	NEW BRUNSWICK	
474A	Point Wolf, Albert, Kings, and Saint John counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
475A	Waterford, Kings and Saint John counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
476A	Salmon River, Saint John county; scale, 1 inch to 1 mile	Topography. For separate distribution.
507A	Rolling Dam, Charlotte county; scale, 1 inch to 1 mile	Topography. For separate distribution.
508A	Canoose River, Charlotte county; scale, 1 inch to 1 mile	Topography. For separate distribution.
523A	St. Andrews, Charlotte county; scale, 1 inch to 1 mile	Topography. For separate distribution.
524A	St. Stephen, Charlotte county; scale, 1 inch to 1 mile	Topography. For separate distribution.
	NOVA SCOTIA	
495A	Sherbrooke Lake, Lunenburg and Kings counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
496A	Springfield, Annapolis, Lunenburg, Kings, and Queens counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
509A	Hopewell, Pictou, Guysborough, Colchester, and Halifax counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
510A	West River, Pictou, Colchester, and Halifax counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
511A	Owls Head, Halifax county; scale, 1 inch to 1 mile	Topography. For separate distribution.
512A	Liscomb, Guysborough and Halifax counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
513A	Melopseketch, Guysborough and Halifax counties; scale, 1 inch to 1 mile	Topography. For separate distribution.

Maps Published April 1, 1939, to March 31, 1940—Continued

Publication Number	Title	Remarks
	NOVA SCOTIA—*Concluded*	
515A	Lake Mulgrave, Halifax and Guysborough counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
516A	Upper Musquodoboit, Halifax and Colchester counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
517A	Lochaber, Guysborough, Pictou, and Antigonish counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
518A	Moose River, Pictou and Guysborough counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
519A	Ecum Secum, Guysborough and Halifax counties; scale, 1 inch to 1 mile	Topography. For separate distribution.
520A	Port Dufferin, Halifax county; scale 1 inch to 1 mile	Topography. For separate distribution.
521A	Tangier, Halifax county; scale, 1 inch to 1 mile	Topography. For separate distribution.
522A	Ship Harbour, Halifax county; scale, 1 inch to 1 mile	Topography. For separate distribution.
531A	Sherbrooke Lake, Lunenburg and Kings counties; scale, 1 inch to 1 mile	Geology. For separate distribution.
532A	Springfield, Annapolis, Lunenburg, Kings, and Queens counties; scale, 1 inch to 1 mile	Geology. For separate distribution.

Maps in Hands of King's Printer, March 31, 1940

Publication Number	Title	Remarks
	NORTHWEST TERRITORIES	
558A	Canadian Eastern Arctic; scale, 1 inch to 100 miles	Geography. For Museum Bulletin 92, by N. Polunin.
	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.

Maps in Hands of King's Printer, March 31, 1940—Continued

Publication Number	Title	Remarks
	BRITISH COLUMBIA—*Concluded*	
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.
	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.
	QUEBEC	
547A	Joliette, Maskinonge, 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.
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; 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.

Maps in Hands of King's Printer, March 31, 1940—Concluded

Publication Number	Title	Remarks
	QUEBEC—*Concluded*	
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.
	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.

Other Map-Work in Varying Stages of Progress

—	Title	Remarks
	NORTHWEST TERRITORIES	
1	Beaulieu River, District of Mackenzie; scale, 1 inch to 4 miles	Geology.
2	Leith, District of Mackenzie; scale, 1 inch to 4 miles	Topography.
3	Gordon Lake South, District of Mackenzie; scale, 1 inch to 1 mile	Topography.
4	Hanbury, District of Mackenzie; scale, 1 inch to 4 miles	Topography.
5	Muir Lake, District of Mackenzie; scale, 1 inch to 1 mile	Topography.
6	Marian River, District of Mackenzie; scale, 1 inch to 4 miles	Topography.
	BRITISH COLUMBIA	
7	Nelson (east half), Kootenay district; scale, 1 inch to 4 miles	Geology.
	ALBERTA	
8	Taber; scale, 1 inch to 4 miles	Geology.
9	Dunmore; scale, 1 inch to 4 miles	Geology.
10	Foremost; scale, 1 inch to 4 miles	Geology.

Other Map-Work in Varying Stages of Progress—Concluded

—	Title	Remarks
	SASKATCHEWAN	
11	Haultain River; scale, 1 inch to 4 miles	Geology.
12	Porter Lake; scale, 1 inch to 4 miles	Geology.
13	Weitzel Lake; scale, 1 inch to 4 miles	Geology.
14	Brustad River; scale, 1 inch to 4 miles	Geology.
15	Upper Clearwater; scale, 1 inch to 4 miles	Geology.
16	MacKay Lake; scale, 1 inch to 1 mile	Geology.
17	Goldfields; scale, 1 inch to 1 mile	Topography.
18	Spalding Lake; scale, 1 inch to 4 miles	Geology.
19	Crackingstone; scale, 1 inch to 1 mile	Topography.
20	Reindeer Lake; scale, 1 inch to 4 miles	Geology.
	SASKATCHEWAN AND MANITOBA	
21	Schist Lake; scale, 1 inch to 1 mile	Topography.
	ONTARIO	
22	Part of Niagara Peninsula; scale, 1 inch to 2 miles	Geology.
23	Stokely Creek, Algoma district; scale, 1 inch to 1 mile	Topography.
24	Verner, Nipissing, Parry Sound, and Sudbury districts; scale, 1 inch to 2 miles	Topography.
25	Capreol, Sudbury District; scale, 1 inch to 2 miles	Topography.
26	Toronto-Hamilton; scale, 1 inch to 4 miles	Geology.
	ONTARIO AND QUEBEC	
27	Casselman, Russell, Dundas, Stormont, Prescott, Carleton, and Papineau counties; scale, 1 inch to 2 miles	Geology.
28	Nepean, Carleton, Lanark, Grenville, Dundas, Gatineau, and Papineau counties; scale, 1 inch to 2 miles	Geology.
	QUEBEC	
29	Waconichi, Abitibi and Mistassini territories; scale, 1 inch to 1 mile	Geology.
30	Mishagomish Lake, Abitibi and Mistassini territories; scale, 1 inch to 4 miles	Topography.
31	Opémisca (east half), Abitibi territory; scale, 1 inch to 1 mile	Geology.
32	Opémisca (west half), Abitibi territory; scale, 1 inch to 1 mile	Geology.
	NEW BRUNSWICK	
33	Salisbury, Westmorland and Albert counties; scale, 1 inch to 1 mile	Geology.
34	Alward Brook, Westmorland, Queens, and Kings counties; scale, 1 inch to 1 mile	Geology.

In addition to the foregoing, some preliminary work was done on about twenty-one maps and plans; also sixty-six map and other figure drawings were prepared for reproduction by zinc-cut process for illustrating reports, papers, memoirs, and museum bulletins.

Other draughting and related work necessary for staff and public use amounted to thirty-nine items.

NATIONAL MUSEUM OF CANADA

The primary functions of the National Museum of Canada are (a) investigational, and (b) educational.

The investigational activities are reviewed by the heads of divisions. The educational activities consist of: (a) the publication of bulletins presenting the results of research; (b) the maintenance of exhibition halls, for which specimens are selected for their educational value, and labels in non-technical language are supplied; and (c) the loan of lantern slides and motion picture films to schools throughout Canada.

ANTHROPOLOGICAL DIVISION

D. Jenness, Chief of the Division, has nearly completed the reorganization of the public exhibits. The full series of guide-leaflets that explain them in detail have now been printed in both English and French. Mr. Jenness worked also on the ethnology of the Coast Salish Indians of British Columbia; he finished a report on one group of them during the year and began a report on another group.

C. M. Barbeau studied the silverwork of Eastern and Western Canada, both European and Indian; he spent several months investigating this subject on the Pacific Coast. Later he began a study of the older methods of making maple sugar in Eastern Canada.

W. J. Wintemberg investigated a supposed Indian cemetery near Desbiens, Quebec, and later he excavated an Indian village site near Dunnville, Ontario.

J. D. Leechman visited about fifty museums in the eastern United States to study the latest methods of preserving and exhibiting specimens. He then toured a number of Indian reserves on the northern prairies to secure the few ethnological specimens that were still worth collecting in that area.

BIOLOGICAL DIVISION

R. M. Anderson, Chief of Division, continued research work on the scientific status, present distribution, and economic values of the mammal species of Canada. The mammal collection, numbering 16,943 specimens, was catalogued and specifically labelled up to March 31, 1940. Much work remains to be done on subspecific or geographic races. From July 27 to October 3 he was engaged in biological investigations in National Parks in Western Canada.

Clyde L. Patch began work on a habitat group of polar bears. Some good additions were made to the collection of amphibians and reptiles.

A. E. Porsild continued work on flora of northwestern arctic and subarctic Canada, a work that has involved revising a number of critical families and genera in the National Herbarium. In connection with his work on reindeer for the Canadian Government, Mr. Porsild and his brother collected 1,730 vascular plants, with a total of 8,000 sheets, in Alaska in 1926. Plants mounted and added to the National Herbarium collection were 3,760, bringing the total number to 155,628 sheets on March 31, 1940. For nearly 2 months Mr. Porsild was detailed for special foreign language work in the Post Office Department.

Hamilton M. Laing made field collections in the Bella Coola region, British Columbia, from June 11 to September 28, 1939, 239 mammals, 72 birds, and a number of amphibians and reptiles, as well as a valuable collection of plants, being obtained.

W. Earl Godfrey, of Wolfville, Nova Scotia, made field collections in western New Brunswick, from July 7 to September 23, 295 mammals, 2 birds, 19 amphibians, and 9 reptiles being collected, all from an area that had been hitherto almost entirely unrepresented in the Museum collections.

Professor Thomas M. C. Taylor, Department of Botany, University of Toronto, continued study of the flora of the north shore of Lake Superior commenced in 1935, centring the work at Peninsula, Thunder Bay district, and thus rounded out the work of five field seasons in this critical area.

ORNITHOLOGICAL DIVISION

No definite field work was undertaken, and P. A. Taverner, Chief Ornithologist, concentrated upon the study of material already acquired, particularly that resulting from the past few years' work from north to south in Manitoba. This has been critically studied and correlated with previous information, with some interesting results.

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 of Mines 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 demand for information on all matters bearing on the possibilities for the commercial development of mineral prospects continued to increase as did the requests for technological assistance in the solving of problems of mineral treatment. Since the commencement of the war there has been a definite renewal of interest in the development of deposits containing chromium, molybdenite, manganese, tungsten, and mercury, and other essential war minerals, most of the Canadian requirements of which are imported. During the war months of the fiscal year, the Bureau was called upon to an increasing extent to furnish the Government's war supply organizations with data on minerals, and to provide technological assistance on matters of direct concern to Canada's war effort.

Distribution of Publications

During the fiscal year, 62,136 copies of Bureau of Mines reports, memorandum series, lists of mines, metallurgical works, etc., were distributed, the large increase over the preceding year arising from the distribution of a booklet "A Glimpse of Canada's Mineral Industry" at the New York World's Fair. Mimeographed work comprised 40,200 pages, and 14,000 notification cards were mailed.

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.

Early in the year, G. C. Monture, until then Chief Editor of the Department, was appointed Chief of the Division, filling the vacancy created by the retirement on superannuation of his predecessor in the preceding year.

Three special investigations were made during the year. The first—under the direct supervision of the Deputy Minister—was an examination into the practical possibilities of a large-scale movement of Turner Valley crude petroleum into Ontario in competition with the imported crudes now refined in that province. Studies were made, with the active co-operation of the producers and refiners, of the reserves and probable productive capacity of the Turner Valley field; the markets in Ontario for petroleum products; and the competitive delivered costs, estimating transportation costs of Turner Valley crude, including pipeline costs to lake head, terminal costs at lake head, and tanker costs down the Great Lakes. The Division of Fuels also contributed by a study of the relative refining qualities of the several crudes. The second, made with the co-operation of the Dominion Bureau of Statistics shortly after the outbreak of war, was a survey of Canada's requirements of war minerals, of stocks on hand, and of sources of supply. The third, made in co-operation with the various mining and prospectors' associations, as well as for war purposes, was a survey of the more or less undeveloped mineral deposits in the Dominion.

Studies were made of the probable effect of iron ore and coal bounties toward the reduction of Canada's large importations of iron and steel products, and on the problem of maintenance of essential crude petroleum importations threatened at the beginning of the war by the diversion of tankers of British registry to overseas service, and by the prohibition of the United States neutrality legislation on the movement of tankers of that country into the Gulf of St. Lawrence.

About fourteen hundred inquiries for information on mining properties and on a great variety of mining subjects were answered. Interviews were given to a great many mineral producers and others in search of information pertaining to mineral resources, development, markets, etc., particularly in relation to war minerals. Much time was also devoted to the work of interdepartmental committees and of committees of the several Canadian mining organizations on strategic minerals and related mining subjects.

The annual survey of the deliveries of fuel oil for consumption in the several provinces was continued. The compilation of the 1938 survey was completed in late December and a tabulated summary of its results was printed and distributed. A survey was also made of bunker fuels used in Manitoba, Ontario, and Quebec in 1938, and a report thereon completed in December. These surveys, made largely for Dominion Fuel Board purposes, involved almost 2 months of field work by an officer of the Division, and afforded first-hand information on current developments in distribution and use of fuel oils.

Field examinations were made of mining developments in Nova Scotia, New Brunswick, Quebec, Ontario, and British Columbia, special attention being given to critical war minerals in order to supplement existing data compiled from office records. A number of mineral samples were received, examined, and reported upon, including 27 of molybdenite, 16 of diatomite, 12 of scheelite, 11 of cinnabar, 6 of chromite, 4 of abrasives, 1 of manganese, and 10 of other minerals.

Special reports on mining properties were prepared for the information of the Deputy Minister in connection with the administration of Section 89, Income War Tax Act, which provides for a 3-year exemption of new metal mining companies from Dominion corporation tax from the commencement of commercial production.

Summary reviews for 1938 on the production and use of 66 Canadian mineral products were completed and published, both as separates and in book form; and similar reviews for 1939 were completed and made available in mimeographed form.

A report, "The Mining Laws of Canada", summarizing the Dominion and provincial laws was published, as were also lists of nine classes of Canadian mine and associated operators. Two manuscripts intended for publication and distribution in connection with Canada's mineral exhibit at the New York World's Fair, 1939, were completed. The smaller, a handy pocket reference booklet, "A Glimpse of Canada's Mineral Industry", designed for general distribution, was printed. Distribution for a short period showed that it met the requirements, and the printing of the larger report, a revision of "The Mineral Industries of Canada" designed for select distribution, was not proceeded with. A special mineral map of Canada was also issued for distribution at the Fair. An officer of the Division was in attendance at the mineral exhibit during July. The manuscript of the booklet was revised by the end of the year in connection with the reopening of the Fair in 1940.

Statistical studies relating to some 85 metals, minerals, and by-products were made, covering in each case Canada's annual production, trade, and consumption from 1913 to 1919 and for the years 1929, 1933, and 1938. The tabulation showed the changes in Canada's mineral position over the quarter-century, in relation both to domestic needs and to world production and markets. A number of special subjects pertaining to various phases of Canada's mineral development were also prepared respectively for publication by the press, for presentation at meetings of technical associations, and for departmental use.

The motion picture film "Gold from Gravels" was completed in sound and previewed at the beginning of the year; and, together with the film "Canada's Treasure Trove", was in active demand for presentation to audiences that are keenly interested in the Dominion's growing gold mining industry.

Library

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

Books and pamphlets acquired by purchase	265
Books, by transfer and gift	102
Reports of Bureau of Mines received from stock	32
Canadian Government documents—individual issues (by exchange and gift)	2,155
British and Foreign Government documents—individual issues (by exchange and gift)	896
Scientific societies' bulletins, proceedings, and transactions, individual issues (by exchange and gift)	1,672
Trade catalogues (by gift)	149
Periodicals and annuals subscribed for	220
Periodicals, annuals, and continuations (by gift)	435
Volumes bound	187
Recorded loans (which included the circulation of 112 scientific periodicals to members of the staff)	4,609

Draughting Section

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

Seven maps presenting mineral information were prepared for reproduction, in addition to the preparation of a special mineral map of Canada for use in Canada Year Book, 1940. Prepared and traced 89 charts, graphs, and drawings, including mechanical drawings for the installation of new equipment in the laboratories.

Eleven charts were drawn, and several others were brought up-to-date and coloured for the Dominion Fuel Board.

Made 3,669 photostat prints and 891 blue-print negatives and positives.

METALLIC MINERALS DIVISION

The Metallic Minerals Division is concerned almost entirely with ore dressing and metallurgical investigations and researches; and more particularly with assisting the Canadian mining industry in devising practical commercial methods for the treatment of ores for efficient metal recovery. The new Ore Dressing Laboratory, designed to afford the maximum of convenience in the setting-up of any desired flow-sheet, was occupied in January 1939, and the past year's experience has demonstrated its effectiveness in facilitating the work of the Division.

New equipment provided during the year included a Spectrographic Laboratory, a Phillips X-ray diffraction unit, and a small Ajax vacuum high-frequency induction furnace. The Spectrographic Laboratory was equipped with a grating type of spectrograph and is essential for the making of rapid and precise qualitative and quantitative analyses of materials in which certain elements are present in exceedingly small quantities.

The outbreak of the war thus found the Division adequately equipped to provide effective assistance to the mining and metallurgical industries in meeting the new war-time demands for minerals and mineral products, and to the departments and boards responsible for the procurement of war materials and supplies.

One hundred and sixty-nine investigations were completed, of which 129 were of a major type requiring the preparation of formal reports and 40 were of a minor type reported upon by letter or otherwise. The setting of this record reflects the increased demand upon the facilities of the Division by the continued expansion of Canadian metal mining, as well as the enlarged capacity of the laboratories. Several investigations of a research character were also in hand on problems or processes of potential interest to the mining and metallurgical industries, but progress was limited by pressure of other work and for the most part they were not completed by the end of the year.

The investigation of the milling-test type for the determination of commercial methods of treating ores for the maximum economic recovery of their valuable mineral constituents applies to the following: 77 gold ores or gold ore products, 5 copper-bearing ores, 4 molybdenite ores, 2 silver-lead ores, 2 iron-nickel-chromium ores, and 1 scheelite ore. These ores originated in the several provinces, as follows: Nova Scotia, 3; New Brunswick, 2; Quebec, 20; Ontario, 41; Manitoba, 6; Saskatchewan, 3; British Columbia, 9; and the Northwest Territories, 3.

Thirty investigations were made on iron, steel, and alloy products in the Metallurgical Laboratory, and reported upon. The Mineragraphic Laboratory made 22 reports on special mineragraphic studies, and prepared and examined 806 polished sections and 38 thin sections in connection with other investigations.

The Chemical Laboratory, which also serves the Industrial Minerals Division, dealt with 6,444 samples, involving 16,527 determinations and 52 different metallic constituents. Of these samples, 890 came from the Industrial Minerals Division, 30 from the Division of Fuels, 25 from the Bureau of Geology and Topography, and 414 were custom samples. Of the chemical determinations made, 33·9 per cent were for gold and 5·4 per cent for silver.

In addition to attending conferences of certain engineering standards committees, the following field work was undertaken during the year by the Chief and other technical officers of the Division:

Inspection of demonstration of the "Sink and Float Process" for beneficiation of minerals and coal, as developed by Du Pont's at Shenandoah, Pennsylvania.

Conferences with officers of the Nova Scotia Department of Mines, and a visit to the Nova Scotia Technical College laboratories, in connection with the treatment of refractory gold ores and manganese ores.

Investigation, to co-operate with the Quebec Bureau of Mines, relating to the equipment of a provincial testing plant, also inspection of tests of a Peacock crusher at Montreal.

Conference with officers of the British Columbia Department of Mines on war minerals available in the province, and inspection of operations at certain British Columbia mining and metallurgical plants.

Investigation relating to smelting tests at Shawinigan Falls, Quebec, on nickel-chrome-magnetite concentrates recovered from asbestos plant tailings.

Investigations at Massachusetts Institute of Technology, Cambridge, Mass., and at the United States Bureau of Mines Experimental Station, College Park, Maryland, of the latest spectroscopic technique.

The following reports issued by the Division cover the results of laboratory investigations on various products as submitted by the mining and metallurgical industries.

Reports published in the semi-annual Reports of Investigations for 1939, and printed in full:

762, Gold ore from the Delnite Mines, Limited, Timmins, Ontario.
763, Gold ore from the Powell Rouyn Gold Mines, Limited, Noranda, Quebec.
764, Gold ore from the Athona Mines (1937), Limited, Goldfields, Saskatchewan.
765, Gold ore from the Piedmont Mining Company, Limited, Vancouver, British Columbia.
766, Gold ore from the Chesterville Larder Lake Gold Mining Company, Limited, Cheminis, Ontario.
767, Gold ore from the Wood Cadillac Mines, Limited, Kewagama, Cadillac Township, Quebec.
768, Gold-silver ore from the Mount Zeballos Gold Mines, Limited, Zeballos River district, British Columbia.
769, Gold ore from the Harry A. Ingraham Trust, Yellowknife, Northwest Territories.
770, Gold ore from the Moneta Porcupine Mines, Limited, Timmins, Ontario.
771, Gold ore from the Athona Mines (1937), Limited, Goldfields, Saskatchewan.
772, Gold ore from Augite Porcupine Mines, Limited, Timmins, Ontario.
773, Pyrite concentrate from the Porcher Island Mines, Limited, Porcher Island, British Columbia.
774, Gold ore from the Hard Rock Gold Mines, Limited, Geraldton, Ontario.
775, Gold ore from the Delnite Mines, Limited, Timmins, Ontario.
776, Gold ore from the MacLeod-Cockshutt Gold Mines, Limited, Geraldton, Ontario.
777, Gold ore from the Chan Yellowknife Gold, Limited, Yellowknife area, Northwest Territories.
778, Gold ore from the Malartic Gold Fields, Limited, Norrie, Quebec.
779, Gold ore from the Barnato mineral claim, Westbridge, British Columbia.
780, Gold ore from the Athona Mines (1937), Limited, Goldfields, Saskatchewan.
781, Gold ore from the Faymar Porcupine Gold Mines, Limited, Timmins, Ontario.
782, Four stainless steel test samples from the Lands, Parks, and Forests Branch, Department of Mines and Resources, Banff, Alberta.
783, Gold ore from the Central Cadillac Mines, Limited, Cadillac Township, Quebec.
784, Copper-gold ore from the Obalski Mining Corporation, Chibougamau area, Quebec.
785, Tungsten ore from the McKenzie Red Lake Gold Mines, Limited, McKenzie Island, Ontario.
786. Gold ore from the Thompson-Lundmark Mine. Yellowknife, Northwest Territories.
787, Gold ore from the Leitch Gold Mines, Limited, Sturgeon River area, northern Ontario.

Reports that are listed by title only in the semi-annual Reports of Investigations for 1939, but which have been submitted to the parties concerned:

Gold-silver-lead ore from Carleton district, Yarmouth County, Nova Scotia.
Wood tar distillates from the Forest Products Laboratories, Ottawa, Ontario.
Chrome-nickel magnetite from the Canadian Johns-Manville Company, Limited, Asbestos, Quebec.

Copper-gold ore from the "Quatsino King" mineral claim, Quatsino Sound, British Columbia.
Concentrate and gold ore from the Hard Rock Gold Mines, Limited, Geraldton, Ontario.
Gold-ore from the Malartic Goldfields, Limited, Norrie, Quebec.
Gold ore from the Jellicoe Consolidated Gold Mines, Limited, Geraldton, Ontario.
Silver-lead-ore from the Jewel Consolidated Mines, Limited, Ainsworth, British Columbia.
Gold ore from the Claverny Gold Mines, Limited, Amos, Quebec.
Gold Ore from the Hasaga Gold Mines, Limited, Red Lake, Ontario.
Pyrite from the Northern Pyrites, Limited, Skeena Mining Division, British Columbia.
Gold-antimony ore from the West Gore Mine, Clarksville, Nova Scotia.
Gold ore from the Abbott Mines, Limited, Lake Wanipigow, Manitoba.
Arsenical gold ore from A. T. Westbrook, Madoc Township, Hastings County, Ontario.
Gold ore from the Morris Kirkland Gold Mines, Limited, Larder Lake area, Timiskaming County, Ontario.
Copper-lead-gold ore from the Brunne Copper Lake Telluride Mines, Limited, Copper Lake, Manitoba.
Cyanide tailing from the J-M Consolidated Gold Mines, Limited, Jackson Manion, Ontario.
Molybdenite ore from the Maniwaki Molybdenite Company, Maniwaki, Quebec.
Gold ore from the Early Bird Claim, Moresby Island, Quebec.
Gold ore from the Algold Mines, Limited, Goudreau, Ontario.
Molybdenite ore from the Cheabella Mine, Montbeillard, Témiscamingue County, Quebec.
Gravel from Vermilion River, Sudbury District, Ontario. (F. J. Adair, Capreol, Ontario.)
Chromite ore from Lake Abitibi, Ontario. (L. W. Coon, Haileybury, Ontario.)
Silver-copper-cobalt ore from Harrison-Hibbert Mines, Limited, Cobalt, Township of Bucke, Ontario.
Gold ore from the Paulpic Gold Mines, Limited, Tashota Station, Ontario.
Gravel from H. H. Smith, Niagara Falls, Ontario.
Molydbenite ore from the Molybdenite Corporation of Canada, Limited, LaCorne Township, Quebec.
Silver-lead ore from the Sheffield Mine, Nicola, British Columbia.
Gold ore from the Brunne Copper Lake Telluride Mines, Limited, Tartan Lake, Manitoba.
Arsenical gold ore from Madoc Township, Hastings County, Ontario. (A. T. Westbrook, Peterborough, Ontario.)
Gold ore from the Broulan Porcupine Mines, Limited, Pamour, Ontario.
Gold-silver ore from the Brunne Copper Lake Telluride Mines, Limited, Athapapuskow Mining Division, Manitoba.
Gold ore from the Melisek Property, Tyrrell Township, Gowganda Mining Division, Ontario.
Calcine from J. Murray Riddell, Duluth, Minnesota, U.S.A.
Gold ore from Claim No. K.K. 677, Herb Lake, Manitoba. (Alex Cupples, Gurney, Manitoba.)
Gold ore from Lake Rowan Gold Mines, Limited, Red Lake, Ontario.
Gold ore and mill water from A. Bethune, Emo, Ontario.
Tailing dump residue from Nova Scotia Mine, Cobalt, Ontario. (J. S. Crosscombe, Haileybury, Ontario.)
Mill products from Chesterville Larder Lake Gold Mining Company, Limited, Cheminis, Ontario.
Gold ore and mill tailing from Cochenour Willans Gold Mines, Limited, McKenzie Island, Ontario.
Black sand from Saint's Rest or Taylor's Island, near Saint John, N.B. (W. J. Wright, Provincial Geologist, Fredericton, New Brunswick.)
Chromium-nickel-iron table concentrate from Canadian Johns-Manville Company, Limited, Asbestos, Quebec.
Molybdenite ore from Greenlee Mines, Limited, Bompas Township, Ontario.
Placer sand from Sawmill Creek, Fort Steel Mining Division, British Columbia. (F. C. McAlpine, Calgary, Alberta.)
Placer sand from H. H. Smith, Niagara Falls, Ontario.
Gold ore from the Theresa Gold Mines, Limited, Long Lac, Ontario.
Gold ore from the Falcon Lake, Manitoba. (W. J. Richards, Kenora, Ontario.)
Mill residue from Peterson Lake, Cobalt, Ontario. (Progress Smelting and Refining Company, Toronto, Ontario.)
Gold ore from Bayside Malartic Mines, Limited, Taschereau, Quebec.
Gold ore from Astoria and Jewel Claims, Bissett, Manitoba. (M. J. Thorarinson, Winnipeg, Manitoba.)
Copper ore from Frontenac County, Ontario. (W. McG. Brown, Toronto, Ontario.)
Gold ore from the King Fissure mine, Brookfield Mines, Queens County, Nova Scotia.

Gold ore from Claim K-9194, District of Kenora, Ontario. (Dr. A. L. MacDonald, Dyment, Ontario.)
Copper-zinc ore from the Normetal Mining Corporation, Limited, Dupuy, Quebec.
Nickel matte from the Falconbridge Nickel Mines, Limited, Falconbridge, Ontario.
Gold ore from the Golconda Mines, Limited, Devangus, Quebec.
Gold ore from the International Mining Corporation (Quebec), Limited, Senneterre, Quebec.
Testing of a wire rope from the Princess Colliery, Sydney Mines, Nova Scotia.
Examination of broken portions of three austenitic manganese steel castings. (Sorel Steel Foundries, Limited.)
The chemical and metallurgical examination of a shovel tractor shoe casting. (Joliette Steel, Limited.)
An examination of a broken crankshaft from Lycoming Aero Engine No. 144. (Department of Transport.)
An examination of a failed Chevrolet axle. (W. Bailey, Purchasing Agent, Department of Mines and Resources.)
An examination of two pieces of welded armour plate. (Department of National Defence.)
An examination of track pins from light tanks and Cardon Lloyd carriers. (Department of National Defence.)
An examination of a failed austenitic manganese steel casting. (Joliette Steel, Limited.)
Identification of worn numbers on copper bird-band. (Lands, Parks, and Forests Branch.)
An examination of welded non-skid endless type chain. (Department of National Defence.)
An examination of a failed austenitic manganese steel ball-mill liner. (Sorel Steel Foundries, Limited.)
An examination of two austenitic manganese steel castings. (Sorel Steel Foundries, Limited.)
Examination of an austenitic manganese steel pin. (Sorel Steel Foundries, Limited.)
An examination of two connecting rod gudgeon pins. (Department of National Defence.)
An examination of a three-foot section of a Bolingbroke centre section spar flange. (R.C.A.F., Department of National Defence.)
An examination of two austenitic manganese steels. (Lynn MacLeod Engineering Supplies Limited, Thetford Mines, Quebec.)
An examination of a stained Alclad sheet. (Ottawa Car Manufacturing Company, Limited.)
An examination of a broken airscrew from Aircraft CV-CCW. (Department of Transport, Ottawa.)
The utilization of the iron, nickel, and chromium in Canadian Johns-Manville tailing. (Canadian Johns-Manville Company, Limited, Asbestos, Quebec.)
An examination of four bearing metal materials. (T. Reid, M.P., Newton, British Columbia.)
An examination of a broken Dilts hydrafiner shaft. (Alexander Fleck, Limited, Ottawa.)
Examination of a rock drill tappet. (Paymaster Consolidated Mines, Limited, Schumacher, Ontario.)
Examination of a failed austenitic manganese steel dipper tooth casting. (Joliette Steel, Limited.)
Examination of the steel of an austenitic manganese steel ball-mill liner. (Sorel Steel Foundries, Limited.)
An examination of a broken landing gear part from R.C.M.P. Aircraft CF-MPE. (Royal Canadian Mounted Police, Ottawa.)
The use of chrom-X additions in manufacturing steel in the high-frequency induction furnace. (Chromium Mining and Smelting Corporation, Limited, Sault Ste. Marie, Ontario.)
A chemical and microscopic examination of three austenitic manganese steels. (Sorel Steel Foundries, Limited.)
An examination of four paper mill burrs. (Northern Foundry and Machine Company, Limited, Sault Ste. Marie, Ontario.)
Microscopic examination of sample from Conley Gold Mines, Wallace Lake, Manitoba.
Microscopic analysis of chalcopyrite in tailings from the Aldermac Copper Corporation, Limited, Arntfield, Quebec.
Microscopic examination of hand specimen of gold ore from the Halliwell Gold Mines, Limited, Montreal, Quebec.
Microscopic examination of amalgamation tailings from Straw Lake Beach Gold Mines, Limited, Emo, Ontario.
Microscopic examination of two samples of gold ore from the DeSantis Porcupine Mines, Limited, Timmins, Ontario.
Microscopic examination of two hand specimens of mineralized quartz from the Sullivan Consolidated Mines, Limited, Sullivan Post Office, Abitibi, Quebec.
Microscopic examination of samples of drill cores from the Calumet Mines, Limited, Calumet Island, Quebec.

Microscopic examination of two samples of mill tailings from the Central Patricia Gold Mines, Limited, Central Patricia, Ontario.
Chemical analyses and microscopic examination of a sample of copper concentrate from the Granby Consolidated Mining, Smelting, and Power Company, Limited, Granby, British Columbia.
Identification of bismuth-bearing mineral in sample of cobalt ore from Cobalt, Ontario, submitted by A. A. Cole, Cobalt, Ontario.
Microscopic examination of specimen of Hyland ore, submitted by C. M. Campbell, Vancouver, British Columbia.
Examination of auriferous arsenopyrite from Seal Harbour Gold Mines, Goldboro, Nova Scotia.
Microscopic examination of sample of arsenopyrite from Seal Harbour Gold Mines, Goldboro, Nova Scotia.
Microscopic examination of sample of ore from Cranberry Lake area, northern Manitoba, submitted by S. L. May, Saskatoon, Saskatchewan.
Microscopic examination of sample of gold ore from the Goldcrest Claims, east end of Lake Athabaska, Saskatchewan.
Determination of metallic mineral in specimen of rock from near Portage du Fort, Quebec.
Microscopic examination of ten special samples of gold ore from the Sullivan Consolidated Mines, Limited, Sullivan Post Office, Quebec.
Microscopic examination of manganese-bearing samples submitted by J. P. Messervey, Department of Mines, Halifax, Nova Scotia.

INDUSTRIAL MINERALS DIVISION

The Industrial Minerals Division is concerned almost entirely with the industrial, or non-metallic, minerals, such as clay, gypsum, building stones, mica, feldspar, salt, and bentonite. Although the value of output of most of these minerals is small in comparison with that of the metals and fuels, they are no less important in the national industrial economy.

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

The Division works in close co-operation with various branches of the Department of Trade and Commerce and other Government bureaus, both Dominion and Provincial. It keeps thoroughly posted on developments in its field by means of reading, research, correspondence, and field investigations. It carries on much testing and experimental work in its laboratories on the properties, processing, and utilization of the industrial minerals. The results of its research are made available to the public through published reports and bulletins, correspondence, direct consultations, public addresses, and technical articles.

Throughout the year increasing time was devoted to strategic war minerals. By September, when war was declared, much of the time of the Division was occupied with investigations, testing work, and the furnishing of information related to war preparations. As a result, the normal work of the Division had to be curtailed.

Occurrences of bentonite in Manitoba, Saskatchewan, Alberta, and British Columbia were examined, and properties in California, Wyoming, and South Dakota, where this material is mined and processed for market, were visited. Inspections were made in the United States of a number of mines and mills producing industrial minerals, including talc and ceramic raw materials in California, and lithium minerals, feldspar, beryl, and mica in South Dakota; and of plants in Colorado and Illinois producing vanadium, uranium, molybdenum, tungsten, and tantalum. Inspections were also made of mining and milling operations in Ontario and Quebec for feldspar, mica, talc, beryl, fluorspar, and nepheline syenite, and of radium and uranium refining operations at Port Hope, Ontario. Eighteen saline brines found in drill holes in Ontario and Quebec were sampled for analysis after a number of wells had been examined. The

results showed that brine immediately above the Precambrian consistently carries bromine, the percentage bearing a definite relationship to the specific gravity of the brine, and increasing as the formation dips to the southwest. A sample of brine from near Belleville, Ontario, comparatively near the outcrop of the contact of the Palæozoic with the Precambrian, had a specific gravity of 1·0116 and a bromine content of about 86 parts per million, whereas a corresponding brine from a well north of Toronto, farther down the dip of the formation, had a specific gravity of 1·2171 and a bromine content of 2,330 parts per million. A report is being prepared.

Recent developments indicate that the potash zones in the Malagash Salt Company's salt mine at Malagash, Nova Scotia, may be more extensive than at first supposed. Because of the possibility of a shortage of potash salts, due to war conditions, likely areas in the mine were sampled and a drilling program was laid out, this being undertaken by the company and the Nova Scotia Government. The potash occurs in a number of distinct zones paralleling the white salt (sodium chloride) seams being worked, and the drilling disclosed a new band in ground hitherto unprospected. The potash content is low as compared with that of other well-known deposits, yet the work has shown that these zones persist from the first to the twenty-sixth level, with a slight increase in potash in the lower levels. Further drilling is required, but already sufficient potash appears to be present to make its recovery worth while. A method is being developed for the recovery of the potash in the form of potassium chloride as a by-product from the manufacture of evaporated salt without interfering with the mining of the white salt, and with the least possible expense for new equipment.

The investigation of the deposits of brucite limestone in Ontario and Quebec, begun in 1937, was continued, and the process developed in the Division's laboratories for recovering magnesia was further improved. Large-scale extraction tests were made on brucite limestone from five deposits, and much other experimental work was done. Quantities of pure granular magnesia and of the by-product lime were supplied to several organizations and companies for further study. A preliminary report on the mode of occurrence, method of treatment, and commercial possibilities of the deposits was published. The deposits are regarded as an important new source of magnesia, an essential war-time commodity. Commercial development of one deposit was proceeding at the close of the fiscal year.

Investigational work was continued on magnesite, asbestos, limestone, lime, building stone and marble, whiting substitute, calcium carbonate filler, and rock wool. Trial lots of whiting substitute and of calcium carbonate filler were prepared from deposits of marl, white limestone, and from by-product lime obtained in the process of recovering magnesia from brucite limestone. In co-operation with officers of the Nova Scotia Departments of Mines and Agriculture, limestone deposits in Nova Scotia were examined, and recommendations were made to the Nova Scotia Department of Agriculture about supplies of pulverized limestone for agricultural use.

Early in the field season, waste mine-rocks and mill tailings in the mining district of northeastern Ontario were examined and tested for use in the construction of low cost roads, particularly stabilized road bases and surfaces. In parts of central Ontario underlain by Precambrian rocks, a survey was made of clayey and other fine textured soils suitable for use as binders and fillers in the building of such roads. In the autumn, at the request of the Department of National Defence, samples of soil were collected from Sydney, Dartmouth, and Debert aerodromes in Nova Scotia to be tested for the most suitable treatment to render them sufficiently stable for runway bases and shoulders. Samples for similar tests were received from the Borden and Uplands aerodromes in Ontario.

Field work on the Industrial Waters Investigation included the northern mining and industrial areas in Ontario and Quebec, the Maritime Provinces, St. Maurice and St. Charles Rivers and the Lake St. John district, as well as other places in Quebec. The samples of surface waters and of civic water supplies collected represent the freshet period for the northern areas and the mean and low gauge for the other districts. Three special investigations were made: one on the Moser River watershed in the northern part of Halifax County, Nova Scotia, for the Fisheries Board of Canada; another on Iroquois Lake at St. Remi d'Amherst, Quebec; and the third on the sea water of the Bay of Fundy, St. Mary Bay, Lunenburg, and Northumberland Straits off the Nova Scotia shore. In all, 30 samples of surface water were collected, of which complete analyses were made, and 73 samples of civic water were collected and analysed for colour, total dissolved solids dried at 110°C., silica, iron, calcium, magnesium, bicarbonate, sulphate, chloride, nitrate, hardness, and alkalinity.

Owing to the war, an attractive market has developed in the United States for peat moss, which had been imported in large quantities from Europe. At the request of the Department of Mines of New Brunswick, investigatory work on deposits of peat moss was carried out in areas on the south shore between St. Stephen and Saint John; in Northumberland and Gloucester Counties; east of Chatham on both sides of Miramichi Bay; and on Shippigan Island. A mimeographed report was published. A cursory examination of peat bogs near Terrance Bay and Mahone Bay along the east coast of Nova Scotia was made at the request of the Department of Mines of that province.

INDUSTRIAL MINERALS MILLING LABORATORIES

The following tests were conducted for the public:

Recovery of china clay and silica sand from crude china clay submitted by the Canada China Clay, Limited, St. Remi d'Amherst, Quebec.

Purification of a sample of sand from St. Donat, Quebec, submitted by Department of Development, Canadian Pacific Railway, Montreal, Quebec.

Calcination and milling tests on a sample of diatomite from Pocologan, New Brunswick, submitted by W. Murray Campbell, Saint John, New Brunswick.

Gypsum from Trail, British Columbia, submitted by Summite Lime Works, Limited, Lethbridge, Alberta, to beneficiate it as a source of plaster of Paris.

Selenite, submitted by G. F. Perry, Moncton, New Brunswick, as a possible source of plaster of Paris.

One hundred and thirteen flotation tests were made on a sample of magnesite submitted by Canadian Refractories, Limited, Kilmar, Quebec.

Two large- and two small-scale tests made on samples of china clay submitted by Canada China Clay, Limited, St. Remi d'Amherst, Quebec.

Flotation tests of a sample of talc submitted by A. D. Bartlett, Oshawa, Ontario.

Concentration tests of a sample of beryl submitted by Canadian Beryllium Mines and Alloys, Limited, Rockingham, Ontario.

Table and flotation tests of a sample of mica submitted by Molybdenite Corporation, Abitibi, Quebec.

Crushed and pulverized 3 tons of waste flux for G. P. Peters and Company of Canada, Montreal, Quebec.

Pulverized a small sample of hydrated lime for Gypsum, Lime, and Alabastine, Limited, Paris, Ontario.

Crushed and pulverized a small sample of fluorite for A. H. Bloor, Toronto, Ontario.

Magnetic separation tests of a sample of sand submitted by E. N. Halton Fyles, Montreal, Quebec.

The following services were rendered to Government and municipal organizations:

For the National Research Council: four hammer-mill tests of asbestos fibre; crushing and pulverizing 1,000 pounds of calcined dolomite.

For the Department of Agriculture: crushed, washed, and screened 30 tons of sandstone; dried, mixed, and pulverized two lots of peat and chemicals.

For the Ottawa Public School Board: pulverized one ton of clay.

In connection with major investigation on brucite, the following work was done:

Processed 10 tons calcined brucitic limestone received from the International Magnesite Company, Calumet, Quebec.

Processed about 600 pounds calcined brucitic limestone for McDonough Mining Syndicate, Toronto, Ontario.

Processed about 2 tons calcined brucitic limestone from various deposits in the Gatineau Valley, Quebec.

Electrostatic, tabling, and flotation tests of various lots of brucite.

Numerous tests connected with activities of the Bureau of Mines were made, and much grinding and preparation of minerals for testing in other laboratories.

CERAMIC LABORATORIES

On the outbreak of war attention was directed particularly to work of wartime importance, and certain other investigations were suspended.

Physical Properties of Canadian Brick.—Additional confirmatory testing was done in connection with this investigation and, as time permitted, the preparation of the final report was proceeded with.

Physical Properties of Canadian Structural Tile.—Samples of tile were obtained from 35 producing plants throughout Canada, and all tests of compressive strength and determinations of absorption properties were completed, individual interim reports being mailed the manufacturers.

Uranium Products.—Co-operating with the chemical staff of Eldorado Gold Mines, Limited, a further large number of tests were made on experimental uranium products for the purpose of developing a process that would assure standard products suitable for the ceramic trade. Recommendations were made for the application of daily control-tests on production. Although occasional tests are still made in the company's laboratories, the most recent advice indicates that the problem has been solved.

Refractories.—A number of tests were made on firebrick, high-temperature cements, etc., for the Naval Service of the Department of National Defence. Memoranda were prepared on the cause of unsatisfactory services given by some refractory linings in the boiler furnaces of naval ships, and recommendations on the use of high-temperature cements were made.

Information was furnished a Canadian manufacturer of refractories on the use of talc in refractory bodies, pointing out the benefits to be realized.

With the object of improving the refractoriness of Canadian firebrick, an investigation was undertaken on the effect of adding bauxite tailing to the body mixture. A large reserve of this aluminous material is available at the concentration plant of the Aluminium Company of Canada.

Refractory tests were made of 12 samples of miscellaneous refractory materials submitted.

Petrographic Work.—Identification and determination of the mineral constituents were made of 80 samples, and petrographic methods were applied in several investigations of this Division and in one for the National Research Council.

Terra Sigillata.—Clays from nine plants for making structural clay products were investigated for use in the production of terra sigillata engobes. The purpose of this investigation is the development of an economical method of improving the surface texture and colour of certain structural clay products made in Canada.

Service to Other Departments.—In addition to the work for the Department of National Defence, reports on various ceramic products and raw materials were prepared for the Customs Division of the Department of National Revenue.

As a service to the Department of Pensions and National Health, several glass melts were made in the Ceramic Laboratories in co-operation with glass technologists from the University of Toronto in an effort to produce a glass suitable for the making of glass eyes. Such glass was formerly imported from Germany.

Ceramic tests were made of 35 samples of clays, shales, or other ceramic raw materials submitted. Special physical tests were conducted on three samples of structural materials.

DIVISION OF FUELS

The Division of Fuels is concerned chiefly with investigatory work pertaining to the more efficient use of solid, liquid, and gaseous fuels, and more particularly to those produced in Canada.

The Chief of the Division and senior technical officers visited collieries and oil and gas plants in the eastern and western producing fields, and discussed problems under investigation. Technical officers of the Division also attended committee meetings with other Government organizations in Ottawa, and in the United States, relative to testing and research work on Canadian coals, petroleum oils, and natural gas. Papers and reports were prepared and published on comparative burning tests of various domestic fuels; on classification, grindability, and friability of Canadian coals; on physical and chemical survey of coals from collieries in Nova Scotia; and on the hydrogenation of Canadian coals and peat for the production of motor fuels.

Two special investigations, of particular war-time significance, were conducted during the latter half of the year, one, on activated carbon for use in gas masks, and the other, on Turner Valley crude oil as a source of aviation gasoline. Supplementing these investigations, the services of three engineers were made available toward the end of the year for other Government war-time duties. Two of these were transferred to the War Supply Board and one to the Dominion Fuel Board, the latter chiefly on work pertaining to the operations of the war-time Coal Administrator.

COAL CLASSIFICATION AND METHODS OF TESTING

Technical officers of the Division of Fuels actively and effectively co-operated in the work of the Associated Committee on Coal Classification and Analysis, and of sub-committees of the Canadian Government Purchasing Standards Committee. The results of some of these activities are to be found in two (co-operatively prepared) publications of the National Research Council, namely: "Report on the A.S.T.M. Standard Specifications for Classification of Coals by Rank and by Grade and Their Application to Canadian Coals" N.R.C. No. 814, and "Specification for Coal" No. 18-GP-1-1940.

Active co-operation was maintained with the work of the Committee on Coal and Coke of the American Society for Testing Materials (A.S.T.M.) having to do with research on, and standardization of, methods of testing. As part of this work, a large number of special tests on typical Canadian coals were made with respect to their weathering, friability, grindability, ignitability, and reactiv-

ity, and plasticity-caking properties during combustion and by-product oven coking. These tests have a bearing on the general handling properties of Canadian coals, and on their suitability for use under mechanically fired boilers and those fired with pulverized fuel, and in the gas and by-product coke industry.

The merits of a furnace heated by acetylene and oxygen for making determinations of coal-ash fusion (F.P.A.) to indicate clinkering properties were investigated, and the results were published. Such a furnace is specially suitable at collieries and commercial plants where a supply of ordinary manufactured gas is not readily available. A study of the coking properties of Welsh and other imported coals, previously in progress, was continued in respect to their classification as anthracite and their suitability as "blower" fuels. Studies of the "capacity moisture" and weathering properties of Saskatchewan and Alberta coals were continued in order to establish the correct position of certain of these coals in the A.S.T.M. classification recently recommended for adoption in Canada.

PURCHASE OF COAL BY SPECIFICATION

Samples submitted by the Department of Pensions and National Health, and by the Penitentiaries Branch, Department of Justice, incident to the purchase of their coal supplies according to specification, were analysed. The services of the staff of the Fuel Research Laboratories were also utilized by the Departments of Public Works, Transport, and National Defence in checking the quality of coal deliveries in relation to that guaranteed by contract.

COMBUSTION ENGINEERING INVESTIGATIONS

Observations covering the performance, under actual service conditions in a private residence, of an automatic stoker of a new type for the use of coke were reported, and further observations were extended to cover the heating season of 1939-40.

The routine work in connection with the collection and plotting of data respecting the degree-day heating load for Ottawa was continued. Two members of the staff continued their attendance at the meetings held during the year of the Fire Protection and Health and Sanitation committees of the National Model Code under the auspices of the National Research Council.

An investigation was undertaken to determine the value of a proprietary chemical which is said, when dissolved in water and spread on a coal, to reduce the clinker characteristics of the coal. The staff was engaged on a new, third series of burning tests for the Canadian National Railways, and during the year five tests were made, namely: three on Pocahontas coals and two on coke.

COAL BENEFICIATION, CARBONIZATION, AND BRIQUETTING

The investigations under this heading included the extension of the physical and chemical survey to the bituminous coal areas of Alberta, the influence of certain chemicals on the storage properties of selected coals, and the experimental manufacture of activated carbon.

The physical and chemical survey of New Brunswick coals was completed with the preparation of 9 typewritten reports in this series. During July and August, new samples were collected in the northern area of Alberta, which, together with those previously obtained in the Crowsnest Pass area of British Columbia, were tested and reported upon. The publication, in mimeographed form, of the "Physical and Chemical Survey of Coals from Canadian Collieries" was begun with Memorandum Series No. 74 covering the Inverness County coalfield in Nova Scotia.

Valuable information on the effect of lime-alum mixtures on the storage properties of coal was obtained from tests made at Coteau, Quebec, where "Dominion" run-of-the-mine coal is stored by the Canadian National Railways. The investigation of the effect of oxidation and blending on the burning characteristics of coals from different Nova Scotia seams, requiring the construction of a special furnace unit with accessory equipment, was continued; and the results obtained afford an explanation of the commercially-observed differences in the combustion and clinkering characteristics of the coals tested. Coal washery plants in different parts of the Dominion were inspected and operation data collected. The new Curran-Knowles coke-oven battery at the Michel colliery of the Crow's Nest Pass Coal Company, Limited, was visited and detailed information on its operation obtained.

The investigation of activated carbon, already referred to, comprised the construction of a large laboratory-scale activator, and the testing in it of different raw materials, including chars and carbonized residues from coconut shells, peach nuts, selected Canadian coals, and low-ash imported anthracites. The tests conducted up to the end of the fiscal year demonstrated that char made from coconut shells in Canadian hardwood distillation ovens was satisfactory for the production of a high-grade activated carbon suitable for use in gas masks.

COAL HYDROGENATION

Liquefaction tests of coals were continued during the first part of the year. Samples from Inverness, Nova Scotia, and from the Pittsburgh seam at Bruceton, Pennsylvania, were tested in the usual way. The latter was included for the purpose of correlating the method of testing of the United States Bureau of Mines with that of the Fuel Research Laboratories. Several runs were made with coal from the Sydney area in Nova Scotia in the course of development of equipment for making runs of long duration. Papers on the subjects of catalysts for coal hydrogenation and on the liquefaction of peat char were prepared and published. The work on the hydrogenation of coal was discontinued to make way for investigations of more immediate war-time importance.

PETROLEUM OILS, BITUMEN, MINE AIR, NATURAL GAS, AND EXPLOSIVES

Studies were made of petroleum and natural gas developments in Alberta, Saskatchewan, and Ontario. A survey was made, comprising the examination of sixty samples of gasoline as marketed at several points across Canada. Analytical work and testing was done on a variety of oil samples submitted by the Bureau of Mines, other Government departments, commercial organizations, and individuals. Crude oils from Alberta, Saskatchewan, and Ontario were analysed, and special tests made to determine their suitability as sources of fuels and lubricants.

Samples of mine airs, mainly from British Columbia and Alberta, were analysed, the object of this work being to reduce the risk of fire and explosion in mines. The survey of natural gas was continued, and samples from Ontario, Saskatchewan, and Manitoba were analysed, including the determination of helium. Other gas analyses were made on samples from investigational projects within the Bureau of Mines and elsewhere. During the first part of the fiscal year, research and analytical work on explosives was conducted for the Explosives Division.

The technical staff engaged in oil and gas investigations was called upon frequently for assistance and advice by other Dominion and Provincial Government departments, companies, and individuals. Co-operation in the work of the Canadian Government Purchasing Standards Committee and of the Dominion Fire Marshals' Association was continued.

Turner Valley Petroleum Investigation.—During the latter part of the fiscal year, the apparatus and personnel previously employed in coal hydrogenation were transferred to an investigation of processes for the treatment of Turner Valley petroleum. The necessary alterations and additions to the equipment of the laboratory were made, and experimental work was in progress at the close of the year. The investigation is concerned with the raising of the octane-rating of gasoline from Turner Valley petroleum to make it suitable as an aviation fuel, and with this crude oil as a possible source of toluene and other aromatic hydrocarbons for the explosives industry.

ROUTINE CHEMICAL LABORATORY WORK

A total of 2,385 samples of solid, liquid, and gaseous fuels were analysed, the examination of which involved some 13,000 separate chemical and physical determinations of different items of analysis. This total number included 127 samples of explosives from the Explosives Division, and 470 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	1,177	49·3
Coals 999		
Activated carbon (from coconut shells, coals, etc.) 119		
Cokes, chars, peat, wood, and miscellaneous 59		
Liquid Fuels	113	4·7
Gasolines and other motor fuels 86		
Crude oils, lubricating oils, and miscellaneous 27		
Gases	83	3·5
Natural gas 30		
Manufactured gas, flue gas, and miscellaneous 53		
2. Samples from other divisions of the Department of Mines and Resources:		
Mainly from Explosives Division	141	5·9
3. Samples from other Government departments and elsewhere:		
Department of Pensions and National Health—coals	56	2·4
Department of Justice (Penitentiaries Branch)—coals	85	3·6
Departments of National Defence and Transport—coals, lubricating oils, fuel oils, and (aviation) gasolines	157	6·6
Other Dominion Government departments—coals and oils	10	0·4
Provincial governments, mostly mine air	488	20·5
Commercial firms, private individuals, etc	75	3·1
Total	2,385	100·0

EXPLOSIVES DIVISION

This Division administers the Explosives Act, and is directly concerned with the safety and regulations relating to the manufacture, transport, and storage of all explosives in Canada.

EQUIPMENT

A new Bichel Gauge for testing the gases produced by explosives and an impact machine for determining the sensitiveness of explosives have been set up, and other improvements have been made in the physical testing laboratory in Ottawa.

FACTORIES

There was a slight increase in the production of commercial explosives during the year, the total amounting to 38,900 tons. Fireworks also showed an increase due to the visit of their Majesties in May and June.

Nine factories are under licence to manufacture explosives, of which three are engaged in the production of fireworks only.

The policy of enlarging the premises and improving the physical condition of the buildings and equipment in the larger factories has been continued with gratifying results.

Inspectors of the Division made 37 visits of inspection to factories during the year.

ACCIDENTS

The ignition of a small quantity of gunpowder in one bay of a building used for loading metallic sporting cartridges cost the lives of two men through the infliction of major burns. An extensive inquiry was made in conjunction with company officials into this accident, and it is believed that the cause has been ascertained. Measures have been taken that, it is hoped, will prevent a repetition of this sad occurrence.

During the year 148 accidents that occurred in the use or handling of explosives were reported. These caused the death of 28 people and injured 161. Thirty-two of these accidents, injuring 38 people, were caused by playing with detonators and other explosives. A yearly tabulation and detailed analysis of accidents involving explosives is kept on file in the Division and is available to interested parties on request.

MAGAZINES

The number of magazines under licence on March 31, 1940, was 316, and 284 temporary magazine licences were issued during the preceding 12 months. Many magazines have been closed for the duration of the war. Stocks are being kept at a minimum and in some cases they have been concentrated in a main magazine where a guard is maintained. All larger magazines are guarded.

Magazine owners were instructed by letter regarding special precautionary measures to be taken during the war. Inspectors of the Division made 334 inspections, and deputy inspectors of the Royal Canadian Mounted Police made 400.

There were 25 cases of illegal entry into licensed magazines and 15 into unlicensed premises. Over 3,000 pounds of explosives were stolen, but some were subsequently recovered by the police.

AUTHORIZATION OF EXPLOSIVES

Twenty-eight new blasting explosives were offered for authorization and examined; of these 25 were accepted for manufacture or importation and 3 were rejected.

A list of authorized explosives, including fireworks, is on file in the office of the Division, and is available for the use of those interested.

The importation permits numbered 477, and 50 special importation permits were issued.

MISCELLANEOUS

About 33 tons of deteriorated explosives were destroyed, about 10 tons by officers of the Division and the rest by the company manufacturing explosives, officials of the Royal Canadian Mounted Police, and others.

Inspectors and deputy inspectors made 4,116 visits of inspection to unlicensed premises.

There were six prosecutions for infraction of the Explosives Act, three for illegal storage, and others for offences in connection with transportation of explosives by truck. Fines were imposed in all cases.

DOMINION FUEL BOARD

The Dominion Fuel Board, comprised of seven members of the staff of the Department of Mines and Resources, operates as a division of the Mines and Geology Branch. Administration of funds provided to aid the Canadian coal industry and of the Domestic Fuel Act (1927) continue as major activities and the Board functions in an advisory capacity to the Cabinet sub-committee dealing with general fuel problems.

Movements of coal under assisted rates increased from 2,020,844 net tons at a cost to Government of $1,865,589 or 92 cents per ton in 1938-39 to a record of 3,646,887 net tons at a cost of $4,477,346 or $1.23 per ton in 1939-40. Among factors accounting for the increase may be mentioned the larger railway requirements due to better grain crops in the West, the quickening of industry in the East partly because of the war, and the increased proportion of Canadian coal used. The coal moved under assisted rates represented 22·6 per cent of the total production of Canadian coal and provided employment for 5,960 men in the industry.

In December, as a measure of economy, and due to changes in the competitive position, considerable alteration was made by the Government in the assistance available to the industry. Rates of assistance on Nova Scotia coal were reduced to approximately those of 1936 and excepting coal for railway use and coking plants, assistance ceased on Saskatchewan and Alberta coals moving to Manitoba markets. At the same time steps were taken to widen the scope of assistance on western coal moving to districts in Ontario between Manitoba and the head of the lakes.

The Board watched developments under the Guffey Act in the United States in order to anticipate the effect upon Canadian markets of the proposed institution of minimum prices for United States bituminous coal.

In September the Secretary of the Fuel Board was appointed Technical Adviser to the Coal Administrator and with the staff of the Board assisted in the establishment of licensing the industry as a precautionary control measure in the event of the development of fuel shortages or undue price enhancement. In conjunction with the Coal Administrator, investigations were made of the stock situation and of the probable sources of supply of anthracite and other

imported coals and coke required in the ensuing year. Transportation and marketing arrangements for Canadian coals were closely investigated and steps were taken to minimize the dislocation in shipments up the St. Lawrence due to war-time restrictions on vessels customarily employed in this trade. No fuel shortages were experienced during the year, nor are any anticipated, though changes are to be expected in the relative volumes of coals from the usual sources.

The Secretary spent some time in New Brunswick investigating problems arising from expansion of the industry. All coal-producing provinces were visited and many special reports were prepared on various phases of the industry.

Coal from British Columbia has been finding increasing outlets in the Prairie Provinces and western Ontario. Considerable tonnages have been sold for export from Vancouver Island mines to the Orient and South America. Increased bunker requirements also have assisted the maintaining of production.

The annual survey of operating costs and revenues of Canadian coal mining districts was again carried out and the results were published in graph form.

Coke plants operating under the Domestic Fuel Act (1927) at Halifax, Quebec, and Vancouver were inspected and a summary of the operations of all Canadian coke plants was again compiled. The Fuel Board also continued to act in an advisory capacity to the Tariff Board in its inquiry into duties and drawbacks on the importation of coke under Reference No. 97.

The Board's Resident Inspector in Winnipeg continued to check the distribution of coal moved under assisted rates to western markets and in the last half of the year assisted in obtaining information required by the Coal Administrator.

The Board again desires to acknowledge the cordial co-operation of the industry and of the many Provincial and Dominion Government departments which have assisted them, also the continued assistance and co-operation of the Bureau of Mines in Washington and the National Bituminous Coal Commission.

PUBLICATIONS

Mines and Geology Branch

English Publication

Report No.

Annual Report for the Fiscal Year Ending March 31, 1939.

French Translation

Rapport annuel sur l'année financière se terminant le 31, 1938.

BUREAU OF GEOLOGY AND TOPOGRAPHY

English Publications

2451 Memoir 219. *Halfway Lake-Beresford Lake Area, Man.*—by C. H. Stockwell and C. S. Lord.

2452 Memoir 220. *Mining Industry of Yukon, 1938*—by H. S. Bostock.

39-1 *Beaulieu River Area, Northwest Territories*—by J. F. Henderson.

39-2 *Opawica Lake and Lewis Lake Map-areas, Abitibi Territory, Que.*—by George Shaw.

39-3 *MacKay Lake Area, Sask.*—by M. L. Keith.

39-4 *Stratigraphy and Structure of Turner Valley, Alta.*—by G. S. Hume.

39-5 *Snare River Area, Northwest Territories*—by C. S. Lord.
39-6 *Quyta Lake Area and Parts of Fishing Lake and Prosperous Lake Areas, N.W.T.*—by A. W. Jolliffe. (Maps only.)
39-7 *Clericy Map-area, Abitibi and Témiscamingue Counties, Que.*—by W. C. Güssow, J. W. Ambrose, and H. C. Gunning. (Map only.)
39-8 *Reindeer Lake and Spalding Lake Map-areas, Sask.*—by L. J. Weeks.
39-9 *Waconichi Map-area, Abitibi and Mistassini Territories, Que.*—by G. Shaw. (Map only.)
39-10 *Nelson Area, East Half, B.C.*—by H. M. A. Rice. (Map only.)
39-11 *Fort Smith Area, N.W.T.*—by J. T. Wilson. (Maps only.)
39-12 *La Pause Area, Abitibi and Témiscamingue Counties, Que.*—by J. W. Ambrose and H. C. Gunning. (Map only.)

French Translations

2448 Memoir 211. *Régions de Thetford, de Disraëli et de la moitié orientale de Warwick (Québec)*—par H.-C. Cooke.
39-2 *Régions des Lacs Opawica et Lewis, Territoire D'Abitibi (Québec)*—par George Shaw.

NATIONAL MUSEUM OF CANADA

English Publications

Bulletin 93. *Assomption Sash*—by M. Barbeau.
Bulletin 94. *Lawson Prehistoric Village Site, Middlesex County, Ont.*—by W. J. Wintemberg.
Bulletin 95. *Annual Report of the National Museum for the Fiscal Year 1938-39.*
Museum Leaflet, Introductory. *Indians of Canada.*
Museum Leaflet No. 5. *The Eskimo.*
Museum Leaflet No. 6. *Pacific Coast Tribes.*
Museum Leaflet No. 7. *The Cordillera Indians.*
Catalogue of Motion Picture Films.

French Translations

Report No.
Bulletin 95. *Rapport du Musée national sur l'année financière 1938-39.*
Fascicule préliminaire. *Les Indiens du Canada.*
Feuillet N° 5. *Les Esquimaux.*

BUREAU OF MINES

English Publications

Separates 755-757 (Investigations in Ore Dressing and Metallurgy, July-December, 1938).
Separates 759-761 (Investigations in Ore Dressing and Metallurgy, July-December, 1938).
788 *Combined Report of Investigations in Ore Dressing and Metallurgy, July-December, 1937.*
792 *Combined Report of Investigations in Ore Dressing and Metallurgy, January-June, 1938.*
795 *Mining Laws of Canada.*
798 *Liquefaction of Canadian Coals by Hydrogenation*—by T. E. Warren and K. W. Bowles.
804 *Canadian Mineral Industry, 1938.*
Petroleum Fuels in Canada, 1938—by J. M. Casey (folder).
A Glimpse of Canada's Mineral Industry.

MIMEOGRAPHED REPORTS

73 *Summary of Tests on Three Domestic Type Wood Burning Hot-Water Boilers.*
74 *Physical and Chemical Survey of Coals from Canadian Collieries—Nova Scotia—Inverness County Coalfield.*

75 *A Preliminary Report on Brucite Deposits in Ontario and Quebec and their Commercial Possibilities*—by M. F. Goudge.

76 *Peat Moss in New Brunswick. A Survey of Areas Offering Industrial Possibilities*—by H. Leverin.

French Translation

75 *Rapport préliminaire sur les Gisements de Brucite dans l'Ontario et le Québec et leurs possibilités industrielles*—par M. F. Goudge.

EXPLOSIVES DIVISION

English Publication

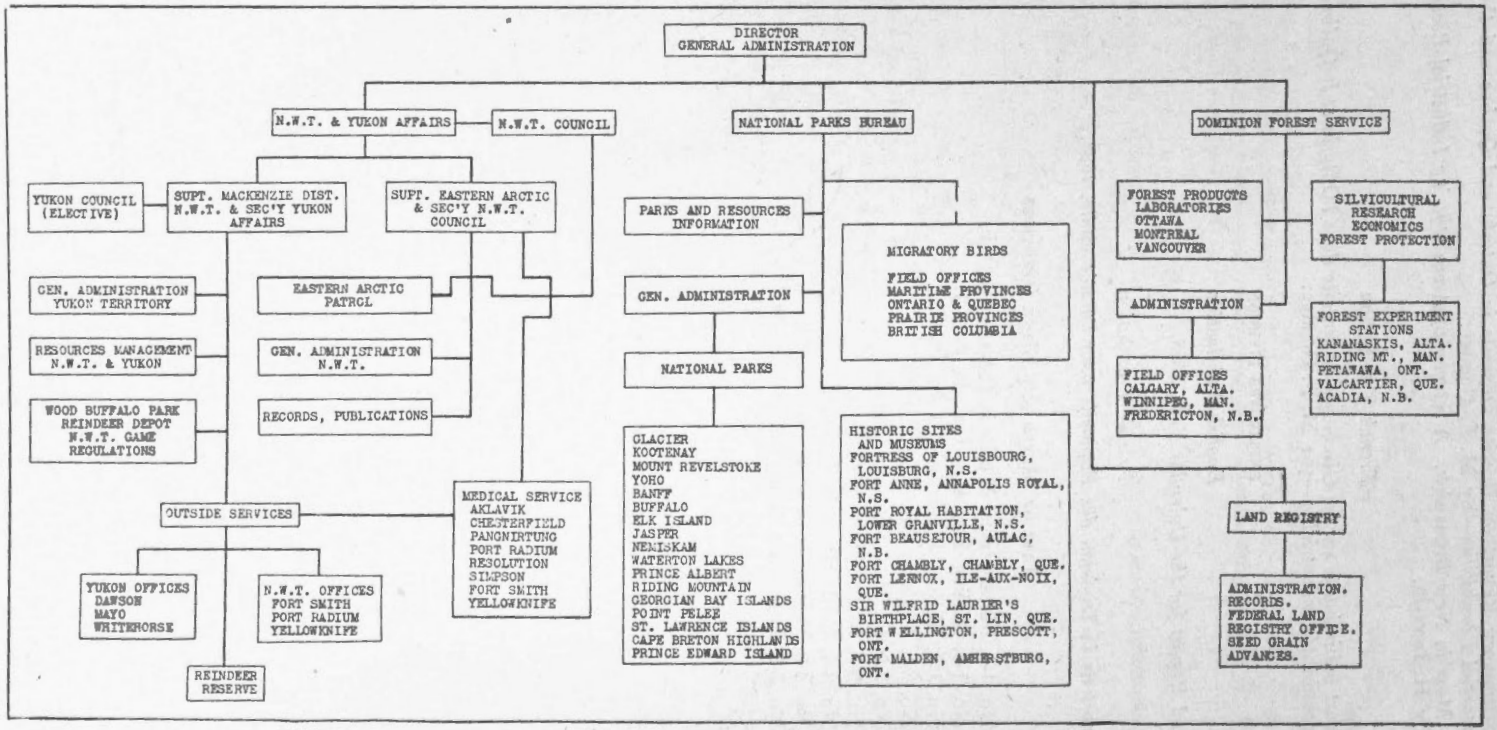
45 *Annual Report for the Calendar Year, 1938.*

French Translation

46 *Rapport de la Division des Explosifs pour l'année civile, 1938.*

LIST OF MINES AND MINE OPERATORS

List No. 1-1, Metallurgical Works in Canada Part II.
List No. 1-2, Milling Plants in Canada Part I.
List No. 1-2, Milling Plants in Canada Part II.
List No. 3-3, Feldspar Mines in Canada.
List No. 3-5, Gypsum Mines in Canada.
List No. 3-7, Mica Mines in Canada.
List No. 4-1, Coal Mines in Canada.
List No. 4-2, Producers of Coke in Canada.
List No. 5-2, Petroleum Refineries in Canada.



Organization Chart, Lands, Parks and Forests Branch.

LANDS, PARKS AND FORESTS BRANCH

ROY A. GIBSON, DIRECTOR

The disturbing conditions that preceded and continued after the outbreak of war had an unsettling effect on general prospecting operations in the Northwest and Yukon Territories. However, the companies that were already mining in the Territories proceeded steadily to increase production, and the interest of experienced and adequately financed operators lent aid and encouragement to the development of promising properties. The substantial character of development in the Yellowknife area has resulted in the establishment of a local administrative district that embraces the area within a radius of 3½ miles from the post office and includes the Con, Rycon, and Negus Mines. The resident population already exceeds 1,000. The Local Trustee Board is composed of two elected and two appointed members, with the Stipendiary Magistrate as Chairman. It has functioned satisfactorily since its creation. By arrangement with the Saskatchewan Liquor Control Board a government liquor store has been established at Yellowknife.

The outstanding events in connection with National Parks administration were the completion of the highway connecting Banff and Jasper National Parks, the reconstruction of a considerable portion of the Cabot Trail in Cape Breton Highlands National Park, the hard-surfacing of part of the road from Banff to Lake Louise and of the Chief Mountain Highway in Waterton Lakes National Park, and the construction of golf links in Cape Breton Highlands and Prince Edward Island National Parks. Much was done to improve the recreational features in the various parks and to provide areas for the convenience of campers. A very encouraging feature was the amount of private capital invested in providing additional hotel accommodation and bungalow camps for the comfort and convenience of travellers.

This Branch undertook for the Department of Labour that part of the National Forestry Program that was carried out on Dominion properties, and also supervised the activities of provincial services participating in the program. The National Forestry Program was a practical demonstration of what could be done for under-privileged boys by healthy work in the woods under adequate supervision.

Economies are being effected in the cost of maintaining the services of this Branch without sacrificing efficiency and at the same time the amount of revenue collected by the Branch is being increased.

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

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, Alberta, and British Columbia, 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 freshwater 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. How-

ever, owing to 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, subject to the provisions of this Act, and of any other Act of the Parliament of Canada applying to the Territories, 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, S. T. Wood.
Secretary—D. L. McKeand.

Work of Council

Sixteen regular and four special sessions of Council were held during the year. Assent was given to ordinances respecting the control and sale of liquor, the administration of local affairs at Yellowknife, and workmen's compensation. Amendments to ordinances dealing with billiard rooms, the legal profession, and businesses, callings, trades and occupations licences were approved.

The Committee on the revision of the Northwest Territories Ordinances reported progress and several obsolete ordinances were repealed.

The organization and itinerary of the annual Eastern Arctic Patrol was arranged.

A number of applications for permits to make exploratory and scientific investigations in the Northwest Territories under the terms of the Scientists and Explorers Ordinance were dealt with and reports of expeditions considered. Other questions dealt with by Council included: game conservation; native welfare; hospitals and medical services; public works and improvements; schools; water power development; reindeer affairs; radio services and administration of justice.

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. 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. To facilitate the administration of justice a qualified barrister, who was appointed Stipendiary Magistrate at Fort Smith, was assigned to Yellowknife. A member of the Royal Canadian Mounted Police at Port Radium is Dominion Lands Agent, Mining Recorder, and Crown Timber Agent. A member of the Force also acts as Sub-Mining Recorder at Yellowknife.

Medical Officers

Medical Officers employed by the Department are stationed at Fort Smith, Resolution, Simpson, Norman, Aklavik, Port Radium, Yellowknife, Chesterfield, and Pangnirtung. All doctors have been appointed coroners, and also act as Medical Health Officers in order to enforce the sanitary regulations. They also supervise the various mission hospitals, residential schools, and industrial homes.

Hospitals

Eight hospitals, situated in the principal settlements, are operated by the Anglican and Roman Catholic Missions. A grant of $2.50 per diem per person is paid to these Missions for the treatment of indigent whites, Eskimos, and halfbreeds. A total payment of $28,700, representing 11,480 days treatment, was made. In addition, the sum of $4,600.31 was paid for the maintenance of mental or other patients in provincial institutions. The Department pays for the care and maintenance of aged and infirm in Industrial Homes operated by the Missions in conjunction with the hospitals at Chesterfield and Pangnirtung, on the basis of $200 per annum. An expenditure of $4,231.11 was made under this heading during the year. These figures do not include the amounts paid by the Indian Affairs Branch for Indians.

Schools

The Roman Catholic and Anglican Missions, assisted by grants from the Dominion Government, maintain day and residential schools in the Territories. During the year 118 children were enrolled in residential schools and 345 attended day schools. The sum of $25,992.31 was expended for educational purposes in addition to a small amount for school supplies. These figures do not include the amount 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. The Grimshaw-Great Slave Lake winter tractor road is also providing a further means of access. During the 1939 season the water transportation companies handled approximately 16,000 tons of freight in addition to that consigned to Eastern Arctic points. The aeroplane companies carried in excess of 600 tons of freight in connection with their Northwest Territories operations. Scheduled flights are maintained throughout the year, except for a short time during the freeze-up and break-up periods.

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, 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 liquor, wine, and beer in the Northwest Territories. The Saskatchewan Liquor Board was appointed Territorial Liquor Agent and under the direction of the Board, a liquor store was opened at Yellowknife on June 27, 1939, from which liquor is sold under permit. An arrangement was entered into with the Saskatchewan Liquor Board whereby all supplies for Yellowknife store are furnished by the Board on a percentage basis. All profits arising out of the operation of the liquor store are to be applied to territorial purposes. The Stipendiary Magistrate located at Yellowknife has been appointed inspector under the Territorial Liquor Ordinance.

During the calendar year 1939, 1,998 liquor permits were issued covering approximately 2,194·68 gallons of spirituous liquor, 64·01 gallons of wine, and 14,491 gallons of beer. Permits authorizing the importation of intoxicants to points in the Eastern Arctic are issued at Ottawa.

Aids to Navigation

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

Lands and Timber

Lands 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 Port Radium and Yellowknife, surface leases are granted for the same purposes. Two lots were sold and patented. Two time sales of lots in Fort Smith Settlement were approved. At Port Radium Settlement there are 17 surface leases in force.

Yellowknife Settlement lies about 615 miles by air north of Edmonton and land was reserved therefor by Order in Council of May 3, 1938, P.C. 968. During the summer of 1938, 7 blocks were subdivided into 126 lots and 9 additional blocks were subdivided into 117 lots in the summer of 1939. Surface leases for 5-year periods are granted and up to the end of the year, 106 such leases have been issued.

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 the Dominion Lands Act. The number of such leases in force is 23.

Ten permits to occupy land during the pleasure of the Department have been granted. There are 5 grazing leases in force and during the year 8 hay permits were issued under which 76 tons of hay were cut.

One hundred and ten timber permits were issued authorizing the cutting of 15,350 lineal feet of timber, 12,000 feet board measure of saw timber, 850 roof poles, and 3,581 cords of wood. Fifty-one of these permits were issued free of dues to educational, religious and charitable institutions, to settlers for domestic use, and to Government departments. In addition, 23 timber berth permits were granted. The revenue derived from lands, timber, grazing, and hay was $7,506.27.

Mining

The local administration of mineral resources of the Mackenzie District, Northwest Territories, is conducted through the offices of the Mining Recorders at Fort Smith and Port Radium, Sub-Recorders being located at Edmonton, Alberta, and at Yellowknife, Simpson, and Coppermine, Northwest Territories. Since the discovery of gold in the Yellowknife area in 1935, mining development has continued, and, while exploration and staking of new claims in 1939 was below the peak reached in 1938, active development proceeded on several properties. The principal field of activity is in this area, 3 gold properties having reached the production stage.

In September 1938 The Consolidated Mining and Smelting Company of Canada, Limited, brought its "Con" mine into production. By the end of March 1939 gold valued at more than $400,000 had been produced from this mine, the production for the year under review amounting to about $1,227,000. Production at this company's "Rycon" mine was reached early in 1939 and by the end of the year gold valued at approximately $54,000 had been mined. The "Negus" mine, owned by Negus Mines, Limited, commenced production in February 1939 and reported production of gold to the end of March 1940 having a value of more than $668,000.

Production continued at the pitchblende-silver property of Eldorado Gold Mines, Limited, at Labine Point, Great Bear Lake, where nearly 100 men are employed. The concentrating mill on this property treated about 100 tons daily and produced during the year approximately 1,000 tons of concentrates. Most of these concentrates were shipped to the company's refinery at Port Hope, Ontario, for treatment.

Miner's licences issued during the year numbered 224, and 514 such licences were renewed. Entries were granted for 831 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 9,079·58 acres. The total revenue obtained from fees payable under the Quartz Mining Regulations amounted to $23,635.25, including $7,985 collected as licence fees.

Placer Mining.—Of more than 300 claims staked and recorded in the South Nahanni and Liard Rivers areas since 1934 only 13 are now in good standing. Placer mining fees amounted to $178.60.

Coal.—Five coal mining leases are in force, comprising an area of 441·60 acres. Revenue from fees, rentals, and royalties in connection with coal mining rights during the year amounted to $317.35.

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 $6,304.07. Petroleum produced from the wells of the Northwest Company, Limited, below Norman on Mackenzie River, amounted to 20,640 barrels. A new refinery unit was erected on the company's

property during the year for the purpose of producing aeroplane gasoline and improved fuel oil products. The addition of this unit resulted in a substantial reduction in the price of gasoline and fuel oil. A total of 1,837 feet of drilling was done during the 1939 season. One oil and gas permit was issued during the year, 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.

Northwest Game Act and Regulations

During the past year certain amendments were made to the regulations. Order in Council P.C. 1005 of May 2, 1939, established the Twin Islands Game Sanctuary. These islands are situated in James Bay. The purpose of the sanctuary is to protect polar bears and migratory birds that frequent the islands. The area of the sanctuary is: North Twin Island, 31 square miles; South Twin Island, 24 square miles.

Order in Council P.C. 1925 of July 22, 1939, authorized a consolidation of the game regulations for administrative purposes. The various sections and clauses were realigned but no important changes in the wording or purport of the regulations were made.

Order in Council P.C. 326 of January 26, 1940, rescinded the regulations governing the payment of bounties for the destruction of wolves effective as from February 29, 1940.

The total area included in reserves established for the protection of the wild life in the Northwest Territories as at March 31, 1940, was 609,277 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.—The wardens made extensive patrols for the purpose of securing data upon the condition of the buffalo and the extent of their range within the park. The usual winter concentrations of buffalo were in evidence in the Murdock Creek area north of the Peace River and Baril Lake area to the south. The wardens reported that the herds were much larger than those observed in previous years.

In accordance with the usual practice 30 animals were slaughtered during the winter season and the meat allotted to missions, hospitals, and the Indian Affairs Branch for distribution to needy native families in districts adjacent to the park. As a result of predator control operations 26 wolves and 4 coyotes were destroyed by members of the park staff.

A cabin was constructed at the mouth of Buffalo River and another near the headwaters of Klewi River to provide for the requirements of wardens who are patrolling the northern area of the park.

Additional work was done on the dam commenced last year in connection with the fur conservation project in the Murdock Creek area and 3 dams and numerous fills in the Dempsey Creek area were also constructed. The sum of $32,000 was expended in connection with these projects. It is estimated that an additional $15,000 will be needed to complete the work at present contemplated under the fur conservation project.

Fur and Game.—A marked reduction is shown in the catch of certain species of fur-bearing animals during the licence year ended June 30, 1939, as compared with the previous licence year. Figures for ermine, all 6 species of fox, and marten are noticeably lower. Returns for mink, muskrat, and otter show a considerable increase.

Caribou.—Reports indicate that, in general, this animal, so important in the economic life of the country, was fairly plentiful during the past year. Efforts are being continued to educate the natives as to the value of conserving the caribou.

Comparative figures of the number of big game animals and birds taken during the licence year ended June 30, 1939, and the average for the 5 years ended June 30, 1938, follow:—

	Year ended June 30		5-year average 1933-1938
	1939	1938	
Deer	20	42	47
Caribou	22,929	18,071	13,150
Moose	1,140	1,205	1,475
Sheep	38	162	98
Partridge	794	1,108	1,122
Grouse	242	324	279
Prairie Chicken	2,350	817	1,309
Ptarmigan	7,847	7,619	6,618
Ducks	11,742	11,359	7,474
Geese	911	1,391	977

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 1934-1939
	1940	1939	
Hunting and Trapping—			
Resident	534	489	471
Non-resident British	0	1	5
Non-resident bird licence	16	7	9
Trading—			
Resident	124	134	135
Non-resident British	6	7	7

Permits

	Year ended June 30		5-year average 1934-1939
	1940	1939	
To establish trading posts	28	23	24
To take mammals for propagation purposes	5	2	2
To hunt and trap in Wood Buffalo Park	335	342	372
To render migratory birds permits operative in N.W.T. (countersigned)	12	13	16
To take specimens of mammals and non-migratory birds for scientific purposes	10	8	12
To take quota (15) of beaver	1,391	1,338	1,386

15029—5½

Revenue

The following is a statement of revenue collected under the Northwest Game Act and Fur Export Ordinance:—

—	Fiscal year		5-year average 1934-1939
	1939-40	1938-39	
	$ cts.	$ cts.	$ cts.
Hunting licences	1,313 92	1,632 32	2,310 62
Trading licences	2,775 00	1,644 14	1,833 83
Bird licences	80 00	35 00	28 00
Fur farm licences	26 00	13 00	20 40
Trading post permits	28 00	23 00	33 90
Sale of furs	436 78	514 43	348 97
Fur export tax	95,848 10	97,760 92	95,221 30
Fines and forfeitures	1,156 17	145 00	139 50
Sub-totals	101,663 97	101,767 81	
Revenue under Businesses, Callings, Trades, and Occupations Licence Ordinance	4,465 00	2,542 50	
Totals	106,128 97	104,310 31	

Infractions of Game Laws.—There were 24 prosecutions for infraction of the game laws. Convictions were secured in 20 of these cases.

Reindeer

Continued progress is reported in the development of the reindeer industry. The round-up of the main herd on the Government reserve near the Mackenzie Delta was held about the end of July at the corrals on Richards Island. The official count showed the surviving fawn increase for the year to be 1,204 head. In addition to the fawns there were 1,969 females, 626 bulls, and 347 steers, a total of 4,146. A round-up of the native herd on Anderson River in August showed 1,196 deer, an increase of 246.

During the summer of 1939 Dr. Seymour Hadwen, Director of Pathology and Bacteriology, Ontario Research Foundation, Toronto, an eminent authority on animal life, inspected the reindeer on behalf of the Department. His investigations covered many features of the reindeer enterprise including a study of the range, with observations respecting diseases and parasitism, herd management, slaughtering, insect pests, dogs, and wolves, and the supervision and extension of the industry.

Dr. Hadwen reported that the reindeer were in excellent condition and that he had observed practically no evidence of infection or parasitism. He had been struck by the amazing fertility of the herds as shown in figures obtained relating to young deer having fawns. Dr. Hadwen's findings were published by the Ontario Research Foundation in an illustrated article entitled "A Visit to the Mackenzie River Delta".

The annual slaughter of surplus reindeer was held on Richards Island. The meat was supplied mainly to the Anglican and Roman Catholic Missions at Aklavik, 55 carcasses being allotted to each mission. The total number of reindeer slaughtered for meat during the fiscal year was approximately 240 head. Thirty-eight carcasses were sold netting $936.

Reports to the end of the fiscal year indicated that both the main herd on the reserve and the native herd near Anderson River were in excellent condition. Reindeer moss was abundant on the inland winter ranges and no unusual losses were suffered through storms or the depredation of wolves. The herding method practised consists of maintaining the deer under constant care but allowing them to spread for grazing purposes over an area of several square miles. This method has proved effective and results in the deer becoming accustomed to the presence of man and are, therefore, handled without any great difficulty.

The Interdepartmental Reindeer Committee held four meetings.

Eastern Arctic Patrol

The annual Eastern Arctic Patrol by the Dominion Government was successfully carried out aboard the R.M.S. *Nascopie* of the Hudson's Bay Company. The Patrol sailed from Montreal on July 8 and after a voyage of 10,660 miles returned to Halifax on September 23.

The Superintendent of the Eastern Arctic, Major D. L. McKeand, was the Officer in Charge and represented the Government in the northern archipelago. The party included the following: R. A. Perkins, Post Office Department; Richard Marriott, Historian; D. A. Nichols, Geological Survey; J. G. Oughton, Royal Ontario Museum; M. Dunbar and D. Chitty, Oxford University; H. S. Peters, United States Biological Survey; Dr. C. H. Williams, National Research Council; L. L. Lyster, Macdonald College; J. Lambert, Secretary. Dr. J. Melling was Medical Officer and Ship's Doctor from Montreal to Chesterfield and Dr. Thomas Melling acted in this capacity from Chesterfield to Montreal. Inspector D. J. Martin was in charge of the Royal Canadian Mounted Police party.

Included in the Government party were Messrs. J. A. McLean and F. G. Whitaker, barristers, who acted as Crown Prosecutor and Defence Counsel respectively, in the Eskimo trial held at Pangnirtung.

The usual inspections were made by the Officer in Charge at each port of call and inquiries instituted to determine the condition of the native population. Although fur production throughout the greater part of the Eastern Arctic was reported to be below normal this year, it was found that the general health and economic condition of the natives were satisfactory in most districts. There was a slight increase in births over deaths.

Medals commemorating Their Majesties' visit to Canada were distributed to the native children at the various posts. Scientific studies undertaken by members of the Government party covered a wider range of subjects than on any previous occasion resulting in a considerable addition to the scientific data available in regard to the Arctic regions.

The supplies for Medical Officers, R.C.M.P. posts, radio stations, and hospitals, loaded at Montreal and Churchill amounted to 414 tons and constituted about one-half the general cargo carried on the round voyage.

Yellowknife Administrative District

Under authority of the Local Administrative District Ordinance for the Northwest Territories, the Yellowknife Administrative District, situated on the north arm of Great Slave Lake, covering an area of 38·48 square miles, was established on October 1, 1939.

The affairs of the District are managed by a Local Trustee Board which commenced to function on January 1, 1940, and thus, for the first time in the history of the Territories as reconstituted in 1905, a local, self-governing, municipal body was established. There is an elected school board of three members. One teacher is maintained and the Alberta curriculum is followed. The Dominion Government gives a quarterly grant at the rate of $1,000 per annum.

Improvements made in Yellowknife Settlement by the Dominion Government include a summer water supply system, roads built through the settlement, sanitary arrangements, and the survey of additional lots as required.

Public Improvements

Further improvements were made to the Grimshaw-Great Slave Lake winter tractor road, also to the roads and wharf at Fort Smith Settlement.

Winter landing fields and seaplane bases were improved at Fitzgerald (Alberta), Fort Smith, Resolution, Rae, Providence, Simpson, Wrigley, Norman, and Norman Wells.

Surveys were carried out at Fort Smith, Hay River, Taltson, Rat River, and Yellowknife Settlements.

Fire-fighting and life-saving equipment were maintained at Fort Smith, Resolution, Yellowknife, Rae, Hay River, Simpson, Providence, and Norman.

Sanitary facilities were improved at several of the settlements, including Resolution, Rae, Hay River, Norman, and Aklavik.

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 the Government 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 April 25, 1939. This was the second session of the eleventh wholly Elective Council of the Territory. The Council was prorogued on May 2, 1939.

The Miner's Protection Ordinance was amended so as to provide for a compulsory examination at stated intervals by a physician for workmen whose work takes them into a quartz mine or into any ore-crushing or rock-crushing

operation of any mine. The examination made by a physician must include X-ray as well as a general examination. Drills must be equipped with a water needle to prevent the escape of dust, and all ores or other material in a mine broken by blasting, and all ores when entering a crusher, must be thoroughly sprayed with water to prevent dust rising therefrom. Amendments were made to the Workmen's Compensation Ordinance and the Game Ordinance.

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 $478,310.74 during the past fiscal year and the revenue collected in the Yukon amounted to $349,252.52. For local purposes the Territorial Government raised $153,485.99, of which amount $100,000 represented the profit from the operation of Government liquor stores.

Lands and Timber

One sale was made; 1 waterfront lease, 1 hay permit, and 4 permits to occupy were granted. Four assignments were registered and 8 renewal leases were issued. There are now in force 23 homestead entries, 8 agricultural leases, 25 waterfront leases, 2 miscellaneous leases, and 17 permits to occupy. The revenue derived from lands amounted to $6,339.57.

One hundred and four permits were issued authorizing the cutting of 351,157 feet board measure of saw timber and 15,387 cords of wood. Three permits to cut wood for mining purposes were issued free of dues. Annual licences were completed for the 33 berths in force and on January 26 an Order in Council, P.C. 310, authorized that the annual licence fee be increased from $2 to $5 as and from May 1, 1940. Ten timber seizures were made. The total revenue collected from timber was $6,795.99.

Mining

Mining continues to be the principal activity and a marked increase in placer gold production was noticeable during the past year. Placer mining operations produced 108,077·89 ounces of gold, the total value of which, at $35 per ounce, is $3,782,726.15. This is an increase of 17,568·38 ounces as compared with the previous year, mainly due to the increased production of Yukon Consolidated Gold Corporation, Limited, which rose from 60,055·76 fine ounces in 1938 to 74,272·42 fine ounces in 1939.

An important development in lode mining was the beginning of production from the Laforma mine in the Carmacks district, where gold deposits were discovered in 1931.

Entries were granted for 200 placer and 101 quartz mining claims staked and applied for during the year, and 2,047 such claims were renewed for another year. As no leases of quartz mining claims were granted or cancelled the area held under lease remains the same as last year, namely, 4,934·42 acres.

Gold Royalty.—The total amount collected for royalty on gold obtained from placer deposits up to March 31, 1940 was $5,197,123.21, of which amount $40,529.58 was collected during the fiscal year.

Dredging.—Three leases to dredge for minerals in the beds of rivers in the Territory are now in force, comprising a total river stretch of about 14½ miles. The total rental from this source up to March 31, 1940 amounted to $210,-206.64. These leases comprise portions of the bed of Klondike River. For the purpose of gold recovery there are 11 dredges engaged in mining in Yukon Territory, most of which are being operated by hydro-electric power.

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 $207,361.50 have been collected on account of such locations, the amount received during the fiscal year being $3,563.

Placer Mining

The total number of placer claims in good standing at the close of the year was 2,644, 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 74,242·42 fine ounces of gold and 17,394·63 fine ounces of silver. The company employed an average of 387 men, the peak during the operating season being 683, and expended $1,061,000 for salaries, wages, and power. A further sum of $803,146 was expended for equipment, supplies, and freight.

The greater part of the 108,077·89 ounces of gold produced during the year was from the Dawson District, the Mayo District producing 1,221 ounces and the Whitehorse District, 875·91 ounces.

Lode Mining

Dawson District.—Entries were granted for 51 quartz claims staked during the year and development work was conducted on 228 claims previously staked. Since the first gold brick was poured last year in the Mount Freegold area, production has increased and 1,147 ounces of gold were produced during the year.

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 calendar year 1939, 54,294 tons of crude ore were milled, producing 7,229 wet tons of concentrates. The average number of men employed by this corporation was 180, and silver, lead, and gold shipped had a value of $2,002,338.43.

Grants and Leases

Prospecting Leases.—Prospecting leases representing a total stretch of 156 miles were issued during the year, comprising locations on several watercourses, an increase of 58 miles as compared with the previous year.

Water Rights.—There are now in force 40 grants to divert water for mining purposes under the provisions of the Yukon Placer Mining Act, which grants aggregate 14,650 miner's inches.

Assay Office

The Assay Office was maintained as usual at Keno by the Territorial Government. A total of 1,272 samples of rock for assay were received from all parts of the Territory, and 1,929 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, 1,272; lead, 631; copper, 7; zinc, 16; tungsten, 2; molybdenum, 1; and tin, 1.

Roads and Bridges

Expenditure on the maintenance of the road system out of Territorial funds were $50,779.94, a decrease of $2,598.47 from the previous year. The operations were confined to maintenance of the roads most used. Some new road equipment was purchased, and all working equipment was repaired and kept in good condition. A special grant of $40,000 was received from the Federal vote for mining roads, and the net expenditure from this grant on roads was $33,005.69. Highway work consisted of the following: Construction of a road from a point on the Overland road eight miles south of Yukon Crossing to Mount Freegold, a distance of approximately twenty-seven miles; improvements to sections of the Hunker-Dominion-Sulphur road, such as ditching, installing culverts, re-forming, and gravelling; re-forming sections of Dawson to Boundary and Upper Sixtymile roads and surfacing with broken rock the impassable parts; extension of the new Silver King Road system from the "Elsa" Camp via the "Calumet" and "Rio" groups of mining claims on Galena Hill, to make a connection with the old Mayo-Keno road at Crystal Crossing.

Development of Aircraft Landing Facilities

An expenditure of $6,989.44 was made from the Federal vote for mining roads for landing fields and a further sum of $653.02 was expended out of Territorial funds. The sum of $1,000 was expended from the Federal grant on the Dawson field to extend the runway for a distance of 1,000 feet and $179.71 was spent out of Territorial funds to remove snow drifts and roll the field for winter use.

An expenditure of $2,000 was made from the Federal grant on the Whitehorse field to enlarge the airport and to surface a new runway. The maintenance of this landing field during the winter was taken care of by the White Pass and Yukon Route and the Pacific Alaska Airways, at their own expense. Improvements were made to the landing fields at Mayo, Carcross, and Carmacks, and the sum of $1,250 was expended out of the Federal grant to construct an emergency landing field at Minto. Emergency landing fields were constructed by the White Pass and Yukon Route at Upper Laberge, Braeburn, Montague, Mica Creek, Crooked, and Strikland Lake about thirty miles from Dawson. The company also made certain improvements to the Selkirk Field.

General

Agriculture.—The summer and early autumn seasons were wet and early frosts damaged vegetables and prevented taking in crops. Hay and grain fodder crops were good, but the season was unfavourable for cutting and curing the crop.

Fur and Game.—The net collections made under the Fur Export Tax Ordinance amounted to $8,861.69, a decrease from the previous year's collections of $1,975.91. A considerable increase is shown in muskrat, weasel, and wolverine, and a small increase in marten, fisher, and bear. Beaver, lynx, fox (all kinds), mink, and otter all show a large decrease.

The number of wolf pelts presented dropped from 637 for the previous year to 266, and coyote decreased from 1,727 to 1,080.

Revenue from fees for licences issued under the Game Ordinance amounted to $5,109, an increase of $965 over the previous year.

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, 10,984; Mayo, 2,483; Whitehorse, 2,130. The numbers of hospital days for indigents were: Dawson, 7,278; Mayo, 144; Whitehorse, 470.

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 215 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 Dominion control; administers Ordnance and Admiralty lands, Dominion owned public lands, Soldier Settlement land on which advances have been made, and timber and grazing on Soldier Settlement charged lands and military reserves. The adjustment of Seed Grain, Fodder, and Relief indebtedness and the issuing of Letters Patent are also functions of this Division.

Central Office of Record

The inventory of lands, maintained in the Land Registry, has been found by the public and by other Government Departments to be a convenient means of quickly finding out the ownership of areas regarding which information is desired. There are 4,680 parcels listed.

Ordnance and Admiralty Lands

Ordnance and Admiralty lands are those areas in the Maritime Provinces, Quebec, Ontario, and British Columbia that 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 6 places in Nova Scotia and New Brunswick, 10 places in Quebec, 5 in Ontario, and 2 in British Columbia.

Under the provisions of Section 8 of the Railway Belt and Peace River Block Transfer Agreement, a commission was appointed consisting of a representative of the Province of British Columbia and one representing the Dominion of Canada, to determine the location and boundaries of Ordnance and Admiralty lands in British Columbia. Mr. Henry Cathcart, Deputy Minister of the Department of Lands, Victoria, B.C., was named by the Province as its representative, and by Order in Council P.C. No. 75, January 11, 1939, Charles Henry Taggart, D.L.S., of the Department of Mines and Resources, was named the representative of the Dominion of Canada.

Meetings of the Commission were held at Victoria, B.C., between February 7 and April 15, 1939, and a thorough investigation was carried out to determine the location and boundaries of those Ordnance and Admiralty lands, the right to administration of which has been under dispute for more than fifty years.

The relations between the Provincial and Dominion officials were most cordial, resulting in satisfactory completion of the work. The locations of the lands and the boundaries of the same were determined and laid down on reference maps, and a description, history, and statement of the status prepared for each of the 172 parcels of land involved.

Surveys.—Surveys were made at Oromocto Reserve, Oromocto, New Brunswick; and at Levis, and Pointe aux Trembles, Quebec.

There were 71 leases and permits issued during the year and 9 sales effected. The revenue amounted to $18,413.66.

Public Lands

The revenue from Public lands, $13,478.57, 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 207 quarter-sections of such lands comprising approximately 33,120 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 the 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. Fourteen patents were issued during the fiscal year.

Timber and Grazing

Grazing.—During the year 6,855 acres were covered by 4 annual grazing permits on Quarantine reserves along the southern boundary of Saskatchewan and Alberta. This was a decrease in acreage of 3,840 acres as compared with last year. The decrease in the area covered by permits is due to the fact that the Department of Agriculture has taken over control of considerable tracts of land in connection with The Prairie Farm Rehabilitation Program. In the summer-grazing season of 1939 there were 277 cattle, 125 horses, and 350 sheep grazing on lots covered by annual permits.

The revenue, consisting of rental, amounted to $137.10.

Timber.—There are 11 licence timber berths within the boundaries of National Parks covering a total area of 65·90 square miles. Two of these berths are in the Province of Manitoba and 9 in British Columbia. During the year licences in duplicate were prepared for these 11 berths and the revenue amounted to $3,781.50.

On the Dominion Government Coal Block near Hosmer, B.C., there are 2 permit timber berths in force, and the revenue amounted to $1,119.92.

During the year 47 accounts, covering timber permits issued to homesteaders by the Dominion before the transfer of the natural resources, were verified for the western provinces.

Seed Grain, Fodder, and Relief Indebtedness

During the fiscal year, the Alberta, Saskatchewan, and Manitoba Adjustment Boards submitted recommendations relating to the adjustment or apportionment of outstanding seed grain, fodder, and relief indebtedness in 825 cases. Their recommendations were ratified by Orders in Council and 542 discharges and releases of liens were issued, resulting in writing off the amount of $29,158.77. There were 1,993 inquiries received from the provinces for statements of indebtedness outstanding relative to the issue of land grants, and 58 certificates of indebtedness were issued to be attached to title. There were also 6,263 inquiries received from the different Debt Adjustment Boards in the western provinces. Gross collections for the fiscal year amounted to $8,752.64, which represents an increase of $4,891.67 over the previous year. The sum of $172.98 was refunded, leaving a net revenue of $8,579.66.

The following summary shows the financial operations for the year:—

Debits	Principal	Interest	Total
	$ cts.	$ cts.	$ cts.
Balance outstanding, March 31, 1939	2,822,091 11	3,171,459 40	5,993,550 51
Claims paid to the Province of Saskatchewan for relief and fodder advances under the 50-50 arrangement	78,871 62	.....	78,871 62
Accrued interest, April 1, 1939, to March 31, 1940	.....	167,462 36	167,462 36
Total debits	2,900,962 73	3,338,921 76	6,239,884 49
Credits			
Net Revenue— April 1, 1939 to March 31, 1940	6,966 30	1,613 36	8,579 66
Amount written off as loss by Orders in Council (Sec. 2, Chap. 51, 17 Geo. V)	9,711 19	19,447 58	29,158 77
Amount collected and retained by Province of Saskatchewan as Commission Clause 18, Natural Resources Agreement with Province of Saskatchewan	.....	7 00	7 00
Total credits	16,677 49	21,067 94	37,745 43
Amount outstanding, March 31, 1940	2,884,285 24	3,317,853 82	6,202,139 06

Letters Patent

During the fiscal year there were 19 Letters Patent issued covering a total area of 1,778 acres, divided among the four western provinces, Northwest Territories, and Yukon.

There were 265 certified copies of Letters Patent issued during the fiscal year.

NATIONAL PARKS BUREAU

The functions of the National Parks Bureau involve the administration of the National Parks Act and Regulations, the establishment of National Parks

and the supervision of all activities within the parks, the preparation and distribution of information respecting National Parks and wild life, and the preservation and marking of historic and prehistoric sites of national importance. The Bureau also administers the Migratory Birds Convention Act and Regulations. In the maintenance of law and order within the National Parks, the Bureau has the assistance of the Royal Canadian Mounted Police, who also are game officers under the Migratory Birds Convention Act. Highways and other public works of a major character in the National Parks are constructed by the Surveys and Engineering Branch of the Department. From April 1, 1939, maintenance and minor construction work which was formerly handled by the Surveys and Engineering Branch was taken over by the Parks Administration.

The National Parks system at the close of the fiscal year included nineteen separate units, having a combined area of 12,403 square miles.

National Parks Visitors

Visitors during the year numbered 995,270, as compared with 954,120 in 1938-39, an increase of 41,150 persons. The largest increases were registered at Banff and Waterton Lakes Parks. Visitors arriving by motor were again in the majority, amounting to approximately 94 per cent of the total, and included 207,236 motor vehicles and 934,346 passengers. Estimated passenger rail traffic was 60,924.

Tourist figures by parks for the fiscal year ended March 31, 1940, compared with returns for the preceding year, are given in the following table:

Visitors to National Parks

Park	1939-40	1938-39
Banff	235,509	192,635
Buffalo	22,006*	10,960*
Cape Breton Highlands	22,035	20,500
Elk Island	53,821	73,056
Fort Anne	17,116*	17,050*
Fort Beausejour	16,589	15,405
Georgian Bay Islands	9,677*	6,169*
Glacier	1,200*	1,200*
Jasper	23,115	19,388
Kootenay	62,063	52,027
Mount Revelstoke	7,500*	6,000*
Nemiskam	30	20
Point Pelee	134,242	203,180
Prince Albert	27,367	29,727
Prince Edward Island	35,488*	10,000*
Riding Mountain	129,846	124,459
St. Lawrence Islands	21,600*	21,150*
Waterton Lakes	108,527	86,517
Yoho	67,539	64,677
Total	995,270	954,120

* Estimated.

Wild Life Conservation

The National Parks of Canada are sanctuaries where all forms of wild life are protected from hunting and trapping.

Under natural conditions the territory comprised in any national park will be found to contain species native to the region maintained by natural control at a level which will not deplete forest cover or range. In the development of

park areas nature is being disturbed to some extent and consequently carefully considered policies of wild life administration are being worked out, based on the constant watchfulness of the warden service, and scientific investigation as need arises.

Investigations carried out during 1939 showed that the various species of wild life in the parks are maintaining themselves in a satisfactory manner. In Waterton Lakes, Banff, Jasper, and Prince Albert National Parks, elk are regaining the ground lost to them in pioneer days, when they were nearly exterminated. Moose are also increasing, particularly along the Banff-Jasper road. Species such as the ruffed grouse, snowshoe rabbit, and marten, which are known to fluctuate in numbers, are on the upgrade in their cycle.

The Department maintains in Alberta three fenced parks for the purpose of preserving animal species native to the plains of Western Canada. These are Buffalo, Elk Island, and Nemiskam National Parks. The first two are buffalo reserves which have also served to protect moose, elk, and deer, and the third is a reserve for prong-horned antelope. After a careful investigation of range conditions and of the buffalo and other animals in Buffalo National Park, it was found necessary to slaughter all the larger animals, so that the range may lie fallow for a time. At the same time investigation in Elk Island Park revealed the magnificent condition of the animals there, particularly the buffalo. Exhibition herds maintained at Banff, Prince Albert, and Riding Mountain National Parks continue to thrive and attract visitors.

Following is a census of wild animals in fenced enclosures in the National Parks, as of March 13, 1940:—

Animals in Fenced Areas

Animal	Banff Park Paddock	Buffalo Park	Elk Island Park	Nemiskam Park	Prince Albert Park Paddock	Riding Mountain Park Paddock	Total
Buffalo*	11	.....	1,084	.....	5	60	1,160
Antelope	.....	.....	.....	70	.....	.....	70
Elk	3	.....	488	.....	.....	84	575
Hybrids (cattalo)†	.....	96	.....	.....	.....	.....	96
Moose	.....	.....	113	.....	.....	3	116
Mule deer	.....	.....	27	.....	.....	6	33
White-tailed deer	.....	.....	.....	.....	.....	7	7
Rocky Mountain sheep	8	.....	.....	.....	.....	.....	8
Totals	22	96	1,712	70	5	160	2,065

*In addition to the buffalo listed here, there is a large herd of buffalo in Wood Buffalo Park.
†These animals belong to the Department of Agriculture and are kept in a special enclosure.

Forest Fire Control

Owing to hot dry weather which prevailed for some time, the fire hazard in the National Parks in the West was high throughout the greater part of the summer season. A total of 120 fires occurred and burned over an area of 13,273 acres, as compared with 51 fires and 2,814 acres burned last year. Of the total area burned, 81·9 per cent was in Riding Mountain Park, 16·6 per cent in Mount Revelstoke Park, and only 1·5 per cent in the remaining parks.

Losses of mature timber occurred in Mount Revelstoke and Riding Mountain Parks, where the value on a merchantable basis was estimated at approximately $19,294. Following is a table showing the cost of fire fighting and total area burned for the years 1938 and 1939:—

Park	No. of Fires	Area Burned—Acres		Cost of Suppression	
		1938	1939	1938	1939
				$ cts.	$ cts.
Banff	33	8	3·5	1,282 94	341 65
Cape Breton Highlands	1	.....	85·0	.....	195 03
Elk Island	1(outside)	.....	.....	.....	11 00
Jasper	12	.....	0·5	29 00	40 84
Kootenay	4(spot)	.....	.....	.....	27 17
Mount Revelstoke	3	.....	2,215·0	.....	9,327 62
Prince Albert	14	67	86·7	460 45	301 51
Riding Mountain	41	2,780	10,817·0	3,226 65	5,378 79
St. Lawrence Islands	1(spot)	.....	.....	6 30	2 50
Waterton Lakes	8(outside)	.....	.....	.....	151 18
Yoho	2(spot)	.....	.....	2 38	11 75
Total	120	2,855	13,207·7	5,007 72	15,789 04

Throughout the summer the warden services in the parks co-operated with the Dominion Department of Agriculture in the collection of insects for the 1939 Forest Insect Survey.

General Maintenance, Construction, and Improvements

Engineering work carried out in the National Parks included the construction and maintenance of motor highways and secondary roads, trails, bridges, and buildings in the parks and historic sites; 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 park townsites.

The mileage of roads, trails, and telephone lines within the National Parks of Canada on March 31, 1940, will be found in the following table:—

Means of Travel and Communication

Region	Roads			Trails	Telephone Lines
	Motor	Secondary	Total		
Banff National Park (including Lake Louise end, Banff-Jasper Highway)	186·4	21·5	207·9	903·0	235·0
Buffalo National Park	2·0	25·0	27·0	57·0	36·0
Cape Breton Highlands National Park	31·6	21·1	52·7	13·8	.....
Elk Island National Park	18·0	2·0	20·0	4·0	16·0
Glacier National Park	.....	12·0	12·0	109·0	3·2
Jasper National Park (including Jasper end, Banff-Jasper Highway)	141·5	10·0	151·5	630·0	372·0
Kootenay National Park	61·1	11·0	72·1	135·0	62·0
Mount Revelstoke National Park	19·0	.....	19·0	49·0	17·0
Point Pelee National Park	9·0	1·5	10·5	.....	6·0
Prince Albert National Park	63·0	75·8	138·8	390·0	151·0
Prince Edward Island National Park	4·0	.....	4·0	.....	.....
Riding Mountain National Park	50·2	70·0	120·2	119·0	218·5
Waterton Lakes National Park	44·4	3·0	47·4	242·9	60·2
Yoho National Park	44·5	6·0	50·5	192·5	56·0
Totals	674·7	258·9	933·6	2,845·2	1,232·9

Unemployment Relief

Unemployment relief work in National Parks was continued during 1939-40. Permanent park residents with domestic responsibilities in Banff National Park were provided with relief on a work basis during April, part of May, and part of December, 1939, and in January, February, and March, 1940. During this period 3,605 man-days of work was provided for 103 individuals having 287 dependants.

The work carried on for unemployment relief included townsite improvements, improvement and maintenance of roads, snow removal, improvement of parking areas, collection of firewood, sanitation clearing along highways, demolition of old buildings, operation of rock crusher, and other miscellaneous works.

Revenue

Receipts from public utilities and other sources of direct revenue in the National Parks of Canada, including administration of the Migratory Birds Convention Act, amounted to $391,570.64 for the fiscal year 1939-40, as compared with $366,223.97 for the fiscal year 1938-39, an increase of $25,346.67.

A statement of revenue by parks, etc., follows:—

National Parks	1939-40	1938-39
	$ cts.	$ cts.
Banff National Park	163,325 78	153,339 77
Buffalo National Park	64,235 58	32,578 16
Cape Breton Highlands National Park	813 61	239 86
Elk Island National Park	4,089 25	20,012 42
Fort Anne National Park	41 60	90 00
Georgian Bay Islands National Park	148 00	119 00
Glacier National Park	191 13	118 55
Jasper National Park	50,508 06	51,010 16
Kootenay National Park	18,770 10	17,607 18
Mount Revelstoke National Park	17 00	1 00
Point Pelee National Park	7,437 45	6,615 10
Prince Albert National Park	14,402 32	13,576 89
Prince Edward Island National Park	892 29	117 35
Riding Mountain National Park	41,136 68	43,820 16
St. Lawrence Islands National Park	200 00	200 00
Waterton Lakes National Park	18,751 99	16,860 67
Wawaskesy National Park	.....	40 00
Yoho National Park	4,333 31	4,240 80
Historic Sites	127 00	391 20
Miscellaneous (Head Office)	23 05	11 29
Fines and Forfeitures	1,485 83	1,190 71
Casual Revenue	2,627 20	3,856 39
Premiums and Exchange	30 43	2 55
Gross Revenue	393,587 66	366,039 21
Less refunds	3,082 30	665 27
Net Revenue	390,505 36	365,373 94
Migratory Birds		
Fines and Forfeitures	779 91	770 61
Casual Revenue	222 37	11 42
Taxidermist licences	63 00	68 00
Revenue	1,065 28	850 03

Publicity and Information

During the year the activities of the Publicity and Information Division in promoting tourist travel to the National Parks were continued on a wide scale. One hundred and forty-six articles descriptive of the scenic, wild life, and recreational attractions of the parks, as well as their historical associations, were given wide distribution to leading newspapers and magazines. More than 200 short articles were circulated by means of the *Canadian Resources Bulletin*, and by special arrangement with the Commissioner of Emigration, London, England, articles and photographs were supplied to newspapers of the British Isles. Material was also furnished to many writers and individuals engaged in press work.

Requests for literature continued in increasing volume from tourist agencies, travel companies, automobile associations, boards of trade, and similar organizations, as well as from educational institutions and individuals. To meet the demand 666,880 copies of publications were printed during the year. Included was an attractive new booklet, descriptive of the National Parks in the Central Rockies, and a folder which was produced for distribution at the New York World's Fair. Illustrated reprints of articles on the Banff-Jasper Highway and the Geology of National Parks in the Rockies and Selkirks were also produced in booklet form. There was a total distribution of 30,500 copies of Immigration literature and 453,022 copies of National Parks literature in addition to approximately 12,500 copies of maps and other pamphlets.

A complete list of publications issued follows:—

Annual Report, National Parks Bureau (Contained in Separate report of the Director, Lands, Parks and Forests Branch) (English edition)	500
Annual Report, National Parks Bureau (French edition)	300
Banff, Kootenay, Yoho, Glacier, and Mount Revelstoke National Parks (Descriptive Booklet)	50,800
Banff National Park (General Information Folder)	25,000
Banff-Jasper Highway, The (Descriptive Booklet)	25,000
Catalogue of National Parks Motion Picture Films (Fourth Edition)	1,000
Canada's Mountain Playgrounds (Descriptive Booklet)	50,400
Canada's Maritime Playgrounds (Descriptive Booklet)	25,000
Geology of the National Parks in the Rockies and Selkirks (Descriptive Booklet)	10,000
Jasper National Park (Descriptive Booklet)	53,580
Jasper 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 Folder)	200,000
Playgrounds of the Prairies (Descriptive Booklet)	25,000
Prince Albert National Park (General Information Folder)	25,000
Riding Mountain National Park (Descriptive Booklet)	50,000
Riding Mountain National Park (General Information Folder)	25,000
Waterton Lakes National Park (Descriptive Booklet)	25,200
Waterton Lakes National Park (General Information Folder)	25,100

The demand for National Parks motion picture films, particularly from educational institutions, resulted in an increased circulation during the year, as indicated by the following comparative figures: 1936-37—3,884; 1937-38—4,026; 1938-39—3,980; 1939-40—4,508. Prints were circulated in the United States, Great Britain, Australia, South Africa, New Zealand, and Alaska, as well as in different parts of Canada. The reported attendance at showings of National Parks films during the year was 3,079,724. National Parks of Canada films were also shown several times a week in the cinema of the British Pavilion at the New York World's Fair.

The film library now contains 93 subjects in 16-mm. size and 85 subjects in 35-mm. size, comprising a total of 1,943 prints descriptive of the scenic, recreational, and wild life aspects of Canada. During the year 7,157 feet of duplicate kodachrome film, 822 feet of negative, and 28,471 feet of positive film were purchased. The above included 142 prints.

Six new subjects were produced in 16-mm. kodachrome film during the year as follows: *Banff to Lake Louise, Motoring in Cloudland, Lakeland Resort, Playground of Two Nations, Sanctuary and Playground,* and *Up the Athabaska Road.*

Co-operation was extended to the National Film Board in the production from national parks film of a new sound picture *The Banff-Jasper Highway.* Assistance was also furnished to other divisions of the Branch in the production of the films *The Forest Inflammability Cycle,* and *Reindeer and the Eskimo.*

The demand for lantern slides as a publicity and educational medium continued, and during the year 6,166 slides, accompanied by suitable lecture notes, were lent to educators and lecturers. The library stock was augmented by 445 new slides, and 1,659 slides from stock were retouched and remounted. A total of 56 photographic enlargements and 102 translites and transparencies were coloured during the year.

Additions to the photographic library included 73 new negatives, and 4,729 prints and enlargements. A total of 9,250 photographs and enlargements were distributed for publicity purposes, and 459 half-tones and line-cuts were lent to editors, publishers, and publicity organizations.

The Canadian Broadcasting Corporation was provided with literature, articles, and special information on national parks for use in the "Canadian Snap-shots" series of broadcasts. Assistance was also provided in making possible a special broadcast on the occasion of the official opening of Prince Edward Island National Park in July, 1939.

The National Parks Bureau participated in the 1939 New York World's Fair with an attractive exhibit in the Canadian Pavilion. The Bureau co-operated with the Canadian Travel Bureau in maintaining a travel information bureau in the Canadian Pavilion for the duration of the Fair. The Bureau was also represented by a well designed exhibit in the Railway Building at the Canadian National Exhibition, Toronto. For the second successive year the exhibit was awarded a gold medal by the Exhibition Association.

Photographs, translites, and other exhibition material were also shown at the following exhibitions: Daily News Exposition, Detroit; Pacific Northwest Tourist Association exhibits at Cincinnati, Chicago, and Minneapolis; and Centennial Exhibition, Wellington, New Zealand.

NATIONAL PARKS OF CANADA

Scenic and Recreational Parks

Banff National Park

Banff was the first of Canada's national parks, and may therefore be credited with being the forerunner of the whole national parks system. Originally a reservation of only 10 square miles set aside to preserve for the public the mineral hot springs which are a feature of this park, Banff now has an area of 2,585 square miles, and is world-famous for its scenery and for the facilities which it affords to the tourist and vacationist. Accommodation ranges from inexpensive but comfortable bungalow camps to luxurious mountain hostelries. Fine motor roads lead to principal points of interest, and more than 900 miles of trails for saddle-pony or hiking trips penetrate the mountain fastnesses. Motor camp-grounds are located at suitable places.

Banff, like all other national parks in Canada, is a wild life sanctuary. It is a year-round sports centre, and its recreations include motoring, riding, fishing, climbing, hiking, golf, tennis, boating, swimming, ski-ing, skating, and curling.

Tourist travel to Banff Park showed a considerable increase over the previous year and established a new high record for the park. The following table gives the total number of visitors entering Banff Park during the past year, and comparative figures for the previous year:—

Visitors to Banff National Park

Route	Motor Vehicles		Passengers	
	1939-40	1938-39	1939-40	1938-39
Westbound—				
Via Banff Park (Eastern Gateway entrance)	50,224	44,125	169,926	142,155
Eastbound—				
Via Kootenay Park (Radium Hot Springs entrance—75% eastbound traffic)	6,305	5,466	19,910	16,573
Via Yoho Park (Leanchoil entrance, 66⅔% eastbound traffic)	1,487	1,260	4,173	3,907
Tourists for Banff Park by rail—east and west (estimated)	.....	.....	41,500	30,000
Totals	58,016	50,851	235,509	192,635

The Information Bureau was open from May 15 to September 30, and dealt with 25,213 inquiries.

Licences and permits issued during the year totalled 21,582 as follows: park licences, 1,353; transient auto licences, 19,510; provincial auto licences, 270; and permits, 449. This represents an increase of 2,156 over the corresponding period last year.

Health conditions throughout the year were generally good, and constant supervision was maintained over all matters affecting public health. Mosquito control was carried out from April to August with very beneficial results.

At the Cave and Basin bath-house a total of 40,373 persons passed through the turnstile, an increase of 2,088 over 1938-39. The total number of persons making use of the Upper Hot Springs bath-house was 46,894, a decrease of 54 as compared with last year.

The public camp-grounds continued to be popular. Registration at Tunnel Mountain camp-ground showed a total of 2,318 motor vehicles and 8,785 campers, a decrease of 23 cars and 86 persons from last year. The number of person-days spent in camp was 22,428, or an average of 2·55 days per person. Outside camp-grounds at Johnstons Canyon, Castle Mountain, Lake Louise, Moraine Lake, and Lake Minnewanka were all used extensively for overnight camping, and all bungalow camps were well patronized throughout the season.

New construction included a warden's cabin at the North Saskatchewan Crossing; a warden's cabin and equipment building at Lake Louise; and 3 shelters along the Banff-Jasper Highway near Bow Peak, Bow Pass, and Waterfowl Lake. Under private enterprise 104 building permits were issued covering work estimated at $171,576, and included a new bungalow camp on the Saskatchewan River, a ski lodge on Mount Norquay, and in the townsite an auditorium, 2 store blocks, and 4 residences as well as numerous additions and improvements.

The Banff-Jasper Highway, which connects Banff and Jasper National Parks, was completed. This road along a mile-high mountain trench and skirting the great Columbia Icefield, promises to become one of the popular scenic highways of the world. Hardsurfacing of the Trans-Canada Highway was continued from Mile 9 west of Banff, and completed to a point just west of Johnstons Canyon at Mile 17·4. In addition several revisions were made to eliminate bad turns and steep grades. All main and secondary roads were maintained in good condition. Other improvements were as follows: the Healy Creek fire road was extended for 1,700 feet; on the Spray River fire road 2 bridges were rebuilt and repaired; 2 miles of fire road were constructed on the Cascade River and 2 small bridges built; the road up Anthracite Hill was repaired and 25 guard rail posts erected; on the Moraine Lake road, 19 culverts were constructed and 1 bridge renewed; 1 large and several small bridges were built on the Stoney Creek and Redearth Creek fire roads.

The Peyto Lake trail was improved and a parking area constructed at the foot of the trail; the Mistaya Canyon trail and the Stoney Creek trail were improved. In addition, 3½ miles of bridle path was cleared between Banff and Minnewanka townsites. On Bow Pass access was opened up to several view points, and the required trails built. A parking area to accommodate 500 automobiles was completed near the ski slopes on Mount Norquay.

A total of 9 miles of new telephone line was constructed, 3 miles from Minnewanka, to join the north line, and 6 miles up Redearth Creek. Revisions and rebuilding of 7 miles on the south line, re-stringing of the north line from Lake Louise to the Saskatchewan River, and part of the south line up Spray Creek.

In the townsite, general municipal services were maintained, and minor construction such as sidewalks and hardsurfacing of townsite streets was carried out. In addition, the parking area at the post office was enlarged, and the old zoo grounds converted into a picnic and playground, with a large parking area along the Buffalo Street side. As a result of a detailed lot and building survey made in 1937, the building situation has been greatly improved, and the townsite now presents a more orderly appearance. The park museum was open from April 1 to October 3, attracting a total of 22,351 visitors.

Reports received from the warden service indicate that wild life is plentiful. Bears were particularly numerous in the vicinity of Banff townsite. Predators are reported to be scarce.

During the year an extended visit to the park was made by a qualified mammalogist, covering as large a proportion of the area as was possible. In his report particular attention was paid to the larger mammals. It was found possible to divide the park area into three parts on the basis of its suitability for game animals. The best range is along the eastern border especially in the northeastern section, where all species find suitable conditions. In the higher parts of the park, lying along the Great Divide, the snows of winter are so deep that only moose and mountain goat find ideal conditions. Along the new highway, which runs through this area, motorists are almost sure to see moose. Animal populations were found to be in satisfactory condition, although the rapid increase of some species carries with it the threat of over-population.

Distribution of fish fry from the Banff hatchery during the past year was as follows: in park waters, 807,650; in provincial waters, 624,090; combined total, 1,431,740.

In co-operation with the Dominion Forest Service, a considerable number of trees infected with mistletoe blight were taken out and cut up for firewood. Some tree planting was carried out at the Tunnel Mountain camp-ground. Other work undertaken included clear-cutting 4 acres in an old burn between Miles 33 and 35, and sanitation cuttings over 8 acres on the Banff-Jasper

Highway. In addition a fireguard 100 feet wide and 640 yards long was cut across the Spray Valley; and a considerable amount of brushing was done in the ski area on Mount Norquay.

The Sky Line Trail Hikers held their annual hike from August 4 to 7. The route followed was from Lake Louise into Skoki and Ptarmigan Valleys. The Trail Riders of the Canadian Rockies held their annual ride between July 28 and August 1, following the route from Egypt Lake to Moraine Lake. The annual Indian Days Sports was held from July 20 to 23, and was attended by approximately 550 Indians. The Banff Springs Golf Week was held in August and attracted over 100 entries. The Banff Tennis Club competitions were run off in September.

The Banff Winter Carnival was held from February 15 to 18 and attracted visitors from many outside points including the United States. For this occasion an ice palace, with a small rink in front of it, was erected on Banff Avenue, north of the Bow River bridge, and a toboggan slide was constructed running down Caribou Street to Beaver Street.

Ski-ing continued to be popular and attracted large crowds to the park. The Dominion Ski Championship Meet was held on the slopes of Mount Norquay from February 29 to March 3 and attracted over 3,000 visitors. The weather conditions were ideal, and two records were established on the downhill run. One hundred and fifteen competitors were entered, among whom were many of the leading ski experts of Canada.

The outstanding event of the season was the visit of Their Majesties the King and Queen, who stayed at Banff from May 26 to 28. While in Banff, Their Majesties enjoyed a pleasant rest from their Canadian Tour, and expressed their admiration of the beauties of Banff National Park.

Cape Breton Highlands National Park

Thrust far into the Atlantic at the eastern extremity of Canada, Cape Breton Island, with its rugged shores, forested highlands, sheltered coves, and fishing villages, affords an ideal setting for a national park. Here, in 1936, Cape Breton Highlands National Park was established. From Cabot Trail, which almost completely encircles it, the mountainous interior supplies an appropriate background for magnificent vistas of shoreline, ocean, and the Gulf of St. Lawrence. The Cabot Trail, rapidly being developed into a first-class highway, connects with the excellent road system of the Province of Nova Scotia. Entrance by the eastern route is made through the famous Bras d'Or (Arm of Gold) Lake region to Ingonish; the western route approaches by way of the beautiful Margaree Valley to Cheticamp. The park has an area of 390 square miles, a present highway mileage of 52·7, and 13 miles of trails. In historic and atmospheric interest it is probably not excelled by any like area on the continent.

No facilities were available for accurately checking the number of visitors. However, from registrations at the local hotels and tourist establishments in the vicinity, it is estimated that more than 22,000 persons visited the park during the year. This represents an increase of approximately 11 per cent over the same period last year.

Licences and permits issued during the year totalled 109 as follows: hay permits, 16; guide licences, 5; timber permits, 74; and ice permits, 14.

New construction carried out during the year was as follows: Completion of the Superintendent's residence, Administration building, and entrance lodge at Ingonish; 2 kitchen shelters, a bath-house and a small power-house, and on the golf course 3 shelters, 2 pumping stations, and 3 foot-bridges were built; 629 lineal feet of stone wall was built in the vicinity of the parking field; a parking area was levelled and graded; a part of the athletic field was sloped and sodded; 3 sides of the tennis courts were riprapped; a gravity water system was installed to service the Administration building, and a lighting plant was installed in the power-house.

Reconstruction of the Cabot Trail under contract was continued. Included in this work was the following: repairs to 2 large bridges on the Cabot Trail; construction of one 60-foot bridge at Presqu'ile Lake, and one 25-foot bridge across an inlet at Ingonish Beach; 81 culverts were constructed; 1,580 feet of timber crib was built at the sea wall on Cap Rouge; 200 feet of dry masonry guard-rail, and 60 feet of timber crib were built on North Mountain; 1,830 feet of guard-rail was built under contract work on the Cabot Trail; and a parking area was graded for a look-out on MacKenzie Mountain.

In addition a one-way road, 3,175 feet long with turnouts, was constructed along the Clyburn River, parallel to the 7th and 8th fairways of the golf course, and a cable foot-bridge 120 feet long was built across the river.

During the year approximately 3¾ miles of new trail was constructed as follows: to the golf course, 4,395 feet; along the north shore of Freshwater Lake from the Administration building to the bathing beach, 3,142 feet; around Middlehead, 4,420 feet; and from the picnic grounds site to the athletic field, 2,094 feet. In addition 1,515 feet of old trail was improved. Communication within the park was carried on satisfactorily by radio telephone. The present installation includes stations at Ingonish Beach and Cheticamp.

As a measure of reducing the fire hazard, sanitation cuttings were carried out over 184 acres in the Middlehead area. No serious forest insect infestations were found in the park.

Wild life within the park is in a healthy condition. Normal increases have been noted in black bear and rabbit. White-tailed deer remain about the same. Among the predators red fox and lynx are increasing, which is a natural sequence of events, resulting from the increase in other animals. Two colonies of beaver were placed in Ropers Brook last year. One colony is now established in Round Lake, and the other in a lake about one and a half miles to the southwest. Bird life remains about the same with the exception of bald eagle which show a definite increase.

Fishing in park waters was very good, with some excellent catches of salmon reported from the Cheticamp River, and trout from Warren and Presqu'ile Lakes, Corney and Black Brooks, and Fishing Cove, North Aspey, and Clyburn Rivers. During the season 105,000 salmon fry from the Margaree Hatchery were placed in the Cheticamp River. Saltwater fishing in the coastal waters adjacent to the park was also good but the swordfish catch was below normal.

Construction of the 18-hole golf course was completed, and it is expected that the course will be opened for play sometime during the summer. The setting is superb, combining seashore, valley, and mountain terrain. The course starts and terminates on narrow, picturesque Middlehead Peninsula which extends about 2 miles into the Atlantic Ocean. It has been designed to make the fullest use of the natural features of the region. Vistas of mountain grandeur, wooded valleys, rugged seashore, placid lakes, and rolling Atlantic add scenic charm to a course which has been scientifically designed to approach the ultimate in golf requirements.

Georgian Bay Islands National Park

Of some 30,000 islands in Georgian Bay, 30 have been set aside as a national park. They have a total area of 5·37 square miles, and afford some wonderful sand beaches with safe bathing for adults or children. Georgian Bay Islands National Park is a popular summer resort and camp place for residents of Eastern Canada and sections of the United States. Beausoleil Island, largest of the group, is accessible from Midland and Penetanguishene, and on it are located the park headquarters, campsites, and other tourist facilities. Flowerpot Island, named from two picturesque limestone formations having the appearance of immense flowerpots, lies north of Bruce Peninsula and is reached from Tobermory. The other islands are in different locations throughout the bay.

During the year it is estimated that 9,677 persons visited Beausoleil and Flowerpot Islands, as compared with 6,169 during the previous year. About 35 per cent of the visitors to Beausoleil Island came from the United States. Approximately 350 people made use of the camp-grounds.

New construction during the year included an ice-house, sleeping quarters, a bath-house, recreation building, and 6 new docks. New construction on Flowerpot Island included a combination warden cabin and equipment shed, a small lookout, and wooden stairs leading to the caves.

Wild life is flourishing, with a noted increase in elk and white-tailed deer. Among the smaller mammals, red fox, black squirrel, racoon, and ground hog are also reported to be numerous. Bird life appears to be increasing, and includes many varieties of land, shore, and water birds. Ruffed grouse, which have been scarce for a number of years, are increasing, and several woodcock have been seen.

Throughout the season patrols to the various islands were made periodically by the park warden. In May, 100 walnut and numerous small pine trees were planted around park headquarters.

Several parties of skiers visited Beausoleil Island during the winter and ski'd on the hills near headquarters.

Glacier National Park

In some respects the most remote of all Canada's national parks is Glacier National Park. Still outside the range of the ubiquitous motor car, and accessible only by railway, Glacier National Park preserves unspoiled some of the finest mountain wilderness scenery in the world. Its ice-fields, snow-capped peaks, luxuriant forests, alpine flora, and subterranean caves are typical of the Selkirk Mountains in which it is located. This park is particularly popular with mountain climbers. There are no facilities for recording accurately the number of visitors, but an estimate of 1,200 is considered conservative. Glacier National Park was established in 1886 and has an area of 521 square miles.

Construction work was limited to general maintenance and repairs.

Because of the ideal sanctuary conditions which prevail in the park, wild life is abundant and thriving. Caribou, mule deer, moose, elk, Rocky Mountain goat, grizzly and black bear, as well as many of the smaller fur-bearing animals are plentiful. Predators are scarce, only an occasional coyote or wolverine being seen. Bird life includes ptarmigan, blue grouse, and many smaller species. Fishing in park waters was good.

The snowfall during the past winter was the lightest for many years, amounting to only 292 inches as compared with 408 inches during the previous year.

Jasper National Park

Jasper, with its area of 4,200 square miles, is the largest of Canada's national parks. Located on the eastern slope of the Rockies in an area rich in historical associations, it is famous for the magnificence of its many majestic peaks, alpine valleys, glaciers, canyons, and beautifully coloured lakes. Outstanding points of interest include Mount Edith Cavell, Maligne Lake, Tonquin Valley, Miette Hot Springs, Sunwapta Falls, Athabaska Glacier, and the Columbia Ice-field. Like Banff, it affords excellent facilities for tourists, ranging from inexpensive bungalow camps and year-round hotels to luxurious accommodation. Summer and winter sports contribute to the enjoyment of the visitor. There are 141·5 miles of motor highways, 10 miles of secondary roads, and 630 miles of trails. The park was established in 1907.

A substantial increase was shown in the number of visitors entering the park. The following table gives a comparison of the numbers of visitors during the past two years:—

Mode of Travel	Motor Vehicles		Passengers	
	1939-40	1938-39	1939-40	1938-39
By Motor Vehicles—				
Canadian	2,937	2,158	10,545	7,299
United States and Foreign	221	168	646	551
By Rail	.....	.....	11,924	11,538
Totals	3,158	2,326	23,115	19,388

The information bureau was established for the first time as a definite unit, with separate quarters in the Administration building. During the season a total of 3,607 inquiries were dealt with.

A total of 3,638 licences and permits were issued during the year as follows: automobile (transient), 1,926; automobile (yearly), 245; provincial drivers, 308; camping, 556; chauffeur, 138; guide, 35; business, 63; timber, 89; building, 47; and miscellaneous, 231. This represents an increase of 241 as compared with last year.

The bath-house at Miette Hot Springs was opened for the season on May 24, and closed on September 9. During the season the number of persons using the swimming pool was 7,792 and the plunge baths 2,221, a total of 10,013 which is a slight decrease from last year.

Motor camp-grounds open to the public were Cottonwood Creek, Miette Hot Springs, and Medicine Lake. Registrations at these points were as follows: Cottonwood Creek, 1,243; Miette Hot Springs, 807; Medicine Lake, 145; combined total, 2,195 campers. This represents an increase of 139 campers over the corresponding period last year.

Improvements carried out at Miette Hot Springs included construction of a 1,500-foot flume to tap springs beyond the dam and increase the water supply. At Lac Beauvert the shore was cleared of stumps and boulders.

New construction included the following: 3 new warden's cabins, and 3 garage and equipment sheds located at Pocahontas, Poboktan Creek, and Decoigne near Yellowhead; a warden's shelter cabin halfway between Byng Pass and Twin Tree Lake, and a lookout station near the summit of Signal Mountain.

Improvements carried out were as follows: On the Jasper-Edmonton Highway, 4,040 cubic yards of crushed rock were spread between Miles 5½ and 11¼; the sharp curve at Mile 1·5 was widened and 700 lineal feet of new guard-rail erected; two culverts were renewed at Mile 32; 6,030 lineal feet of guard-rail was repainted between Miles 12 and 15; and a new traffic bridge was built across the Athabaska River at Mile 2·7. On the Miette Hot Springs road, work of clearing rock slides, opening culverts, and cleaning ditches commenced early in May; rock work was completed at Mile 3½ and the proper grade established; all bridges were painted; 8,800 lineal feet of new guard-rail was constructed and 6,242 lineal feet painted. On the Edith Cavell road the new revision at Mile 3½-4 was gravelled; culverts were renewed where required and 640 lineal feet of new guard-rail was constructed; the Athabaska River bridge and guard-rails at the approaches were painted. On the Medicine Lake road the parking space at the end was levelled and extended. On the Pyramid Lake road the widening at Pyramid Lake was completed and 1,200 lineal feet of new guard-

rail was constructed. On the Jasper-Yellowhead Highway, 1,780 feet of new guard-rail was constructed between Miles 2 and 3, and the shoulders brought up to grade. Construction of the Banff-Jasper Highway was completed except for surfacing and finishing.

Six miles of new trail construction was carried out as follows: Signal Mountain trail, 3 miles; Portal Creek trail, 1·5 miles, and Maligne Lake-Evelyn Creek trail, 1·5 miles. All of these trails are of an improved type with a maximum grade of 10 per cent. Considerable improvement work was done on the Snake Indian trail, including the replacement of 1 pier and 2 spans on the Snake Indian bridge at Devona. New bridges replacing old structures were built over the Brazeau River, Twin Tree Creek, and Maligne Canyon; 3 smaller bridges were built at the south end of Medicine Lake. The Maligne River bridge at the outlet of Maligne Lake and No. 2 bridge at Maligne Canyon were redecked.

Thirty-two miles of new telephone line were constructed along the Banff-Jasper Highway. Two miles of poles were re-set between Miles 28 and 30 on the East Highway; telephones were installed in the new warden's cabins at Pocahontas, Poboktan Creek, and Decoigne; and the Lake Edith subdivision and Lake Annette picnic grounds were given emergency telephone service during the summer.

The automatic telephone system in the townsite performed satisfactorily throughout the season. The installation of new 30-pair cable for extension of the service to Blocks 8, 10, 12, and 25 was completed. The number of automatic telephones now in use is 57.

All streets in Jasper townsite were treated with oil where required. During the season portions of the following streets were hard-surfaced: Pyramid, Miette, Cedar, Fir, Elm, and Hazel Avenues and Patricia Street. Hard-surfacing was also done for half a mile along the Jasper-Edmonton Highway, and on part of the newly constructed parking area opposite block 3. Four thousand lineal feet of concrete kerbing was put down on Elm and Miette Avenues and Patricia Street; a new sidewalk alignment was made, unsightly boulders removed, and a riprap wall built. A new sidewalk 200 feet long was built at the south end of Connaught Drive and continued along Spruce Avenue; the sidewalk on the north side of Geikie Street was extended for 300 feet, and a parking space 350 feet by 57 feet was constructed opposite Block 3. In May, tree planting and preparation of flower beds was undertaken and, in September, top-dressing was applied and the young trees staked up for the winter.

During the season 7 water and 8 sewer connections were made to houses under construction.

All species of wild life show normal increases. Feed conditions were exceptionally good during the winter, with the result that the animals were not crowded into the lower valleys. Beaver are quite numerous in the Athabaska Valley and are spreading to outside districts; mule deer are more plentiful than usual. Grizzly and black bear are normally plentiful with the former showing a slight increase. Elk are very numerous and are slowly spreading in all directions and moose are slightly more numerous. Rocky Mountain sheep, goat, and caribou are well represented in practically all districts. The smaller fur-bearing animals are reported to be thriving, with marten very plentiful in the Maligne and Whirlpool districts. Among the predators coyote and cougar are reported to be numerous, with a few wolves in the Pyramid Lake-Snaring River area. Three live bear cubs and a pair of beaver were shipped to Wellington, New Zealand.

During the year many parts of the park were visited by an experienced biologist, who found wild life conditions to be satisfactory. The population of predatory animals was considered to be compatible with national park standards, which require that healthy animal populations be preserved without hunting and with as little interference with nature as possible.

A decided improvement in fishing was noted in all districts in Jasper Park. The total number of permits issued in the Maligne-Medicine Lake area was 944, as compared with 1,140 last year. The total number of fish taken was 5,387, or an average of 5·7 fish per permit. The average weight per fish was 13 ounces, as compared with 11·12 ounces last year. Excellent catches were reported from Lake Edith, Celestine Lake, Leach Lake, and Buck Lake. A number of rainbow trout, each weighing 6 pounds, were taken from Lake Edith.

Stocking of lakes was continued and during the season some 538,494 rainbow trout fry from the Jasper Hatchery were distributed in park waters as follows: Riley Lake, 4,000; Pyramid Lake, 154,000; Patricia Lake, 54,000; Lake Annette, 135,494; Lake Edith, 138,000; Trefoil Lake, 6,000; Leach Lake, 8,000; Mina Lake, 4,000; Valley of the Five Lakes, 25,000; Sulphur Creek, 6,000, and Horseshoe Lake, 4,000.

A 70-foot log-dam was constructed across the outlet of Beaver Lake to raise the water level about 2 feet, and introduce a quantity of new feed. The results produced on the size and improved condition of the fish were very noticeable. The hatchery was opened again in March to receive 500,000 rainbow trout eggs.

A comprehensive study of the waters of the park was made during the year, resulting in an accumulation of data on which it will be possible to base fisheries management practices in the future.

Sanitation cuttings and thinnings were carried out over a distance of one mile on the Edith Cavell road and for 200 yards along the approach to Astoria camp. In making these cuttings special attention was paid to creating view-points overlooking the valley below.

Opportunities for many forms of recreation are found in Jasper Park, including riding, hiking, golf, motoring, fishing, tennis, camping and climbing in the summer, and ski-ing in the winter. In addition, bathing may be indulged in at the well known hot springs at Miette.

Ski-ing as the main winter sport has continued to increase in popularity, and during the past winter attracted large numbers of local residents, as well as visitors from outside points. The Jasper Ski Club held two successful meets in which contestants from Edson, Jasper, and Blue River took part. The Provincial Slalom and Downhill Championships were held at Mount Edith Cavell on March 16 and 17 and were run off under ideal conditions.

During the summer a considerable amount of work was undertaken to improve ski-ing conditions in Jasper, and included construction of a new downhill run about 3½ miles long on Whistler Mountain, which is considered to be one of the best downhill runs in Canada.

The outstanding event of the year was the visit of Their Majesties King George VI and Queen Elizabeth on May 31 and June 1. Their Majesties spent 24 hours in the park and among other things enjoyed the Edith Cavell drive and walks around the grounds of Jasper Park Lodge.

Kootenay National Park

Kootenay National Park owes its existence to the Banff-Windermere Highway, which passes through it, as the park was established to preserve in its natural state the beauty of the area traversed by the highway. It is on the western slopes of the Rockies and is marked by many deep canyons and beautiful valleys. Like Banff and Jasper, its attractions include hot springs with excellent bathing facilities. Other recreations are riding, hiking, climbing, fishing, and motoring. Motor camp-grounds are provided, and there are 61 miles of motor highways and 135 miles of trails. The park was established in 1920 and has an area of 587 square miles.

Tourist traffic into Kootenay Park showed a marked increase over the previous year. This increase is probably due to the improvement in road conditions between Cranbrook and Radium Hot Springs. Many visitors from Banff enter Kootenay Park at Vermilion Pass, and return eastward to Banff Park without registering at Radium Hot Springs; the following figures therefore include 5 per cent of westbound traffic into Banff Park:—

	Motor Vehicles		Passengers	
	1939-40	1938-39	1939-40	1938-39
Eastbound—				
Via Radium Hot Springs	8,407	7,289	26,546	22,098
Westbound—				
Via Radium Hot Springs	8,827	5,800	27,873	23,203
Via Vermilion Pass (5% Banff westbound traffic to Oct. 31)	2,218	1,980	7,644	6,726
Totals	19,452	15,069	62,063	52,027

Licences and permits issued during the year totalled 264, as follows: Chauffeurs, 11; automobile, 7; dog, 2; business, 29; timber permits, 4; and camping permits, 211.

Throughout the season regular inspections of all camp-grounds and public services were made by the Medical Health Officer.

During the year a total of 25,061 persons made use of the bathing facilities at Radium Hot Springs as compared with 24,147 persons during the previous year. This is an increase of 914 persons.

The park motor camp-grounds continued to be popular, but again a decrease was noted in the number of persons making use of these facilities. As usual the Radium Hot Springs (Red Rock) camp-ground attracted the largest number of visitors, with a total registration of 1,093 persons. The total time spent in camp was 2,441 person days, or an average stay of 2·2 days per person.

New construction carried out during the year included: 2 new winter patrol cabins, 1 on Simpson River and 1 on Settlers road, both near the park boundary; at Radium Hot Springs, an equipment shed and extension to the garage; 2 log storage sheds for gasoline and oil, 1 at Kootenay Crossing and 1 at Blacks Camp, and a loading platform at McKay Creek. A portion of the rock retaining-wall near the bath-house was rebuilt and reinforced with concrete.

The Banff-Windermere road, which is the main highway through the park, was opened for travel on May 18, and remained open until November 9. Maintenance work on this road included spreading of dust-laying oil, replacement of old culverts, and cutting of brush at curves. The bridge over the Kootenay River was painted and a rock retaining-wall constructed near the Blakley Bungalow Camp. Improvement work on trails was carried out as follows: grading and widening on Tumbling Creek trail; relocation where necessary on Pitts Creek trail, and erection of a new 35-foot bridge near McLeod Meadows. Nine miles of new trail were constructed as follows: 3 miles from the cable to the lake opposite McLeod Meadows; 4 miles from the cable to 1 mile south of Pitts Creek; and 2 miles between Dover Creek trail and the Vermilion River.

All wild life in the park is in good condition and thriving. Elk, mule deer, Rocky Mountain sheep and goat, and black and grizzly bear are increasing. The numbers of white-tailed deer remain unchanged and moose have decreased. The smaller fur-bearers, including marten and weasel, are increasing, while beaver, wolverine, and lynx do not show any change. Bird life is normal with the exception of golden eagle, which are increasing.

Fishing in park waters was poor, only about 150 cutthroat and Dolly Varden trout being caught during the entire season. In September 100,000 cutthroat trout fry were planted in park waters, as follows: lake east side of Kootenay River, 30,000; lake west side of Settlers road, 10,000; Dolly Varden Creek, 25,000; Lake Olive, 5,000; Sinclair Creek, 10,000; Kimpton Creek, 10,000, and Dover Creek, 10,000.

Although the swimming pool at Radium Hot Springs was the main attraction, the tennis courts again proved to be very popular.

Mount Revelstoke National Park

Mount Revelstoke National Park lies on the western slope of the Selkirk Mountains, between the valleys of the Columbia and the Illecillewaet Rivers. It consists largely of a plateau at an altitude of 6,500 feet marked by high alpine meadows with scattered groves of fir and spruce, and, in summer, veritable gardens of wild flowers. It is widely known as a winter sports resort, and is reached by means of a picturesque motor road from Revelstoke. A suitable camp-ground has been laid out. The principal recreations are fishing, hiking, and ski-ing. The park was established in 1914. It has 19 miles of motor road and 49 miles of trails. Its area is 100 square miles.

As there is no resident Superintendent in the park, no actual check of visitors is maintained. However, on the basis of voluntary registration at the lookout station, situated on the summit of Mount Revelstoke, it is estimated that approximately 7,500 persons entered the park during the year.

New construction carried out included a log registration booth at the end of the road on the summit of Mount Revelstoke; a picnic ground and viewpoint at Mile 5½ on the Mount Revelstoke auto road, with a fireplace, 2 log shelters, and 2 comfort stations, and a stone wall built around the viewpoint. Under private enterprise, a new tourist chalet was erected near the end of the road on the summit of Mount Revelstoke. About 4 miles of new trail was built in the Greely Creek area, and a quarter-mile of telephone line was erected to the new picnic grounds.

Wild life is plentiful and in good condition. Rocky Mountain goat, caribou, and deer are seen frequently, and grizzly and black bear are fairly numerous. Small fur-bearers are scarce and predators such as wolf, wolverine, and cougar are rarely, if ever, seen. Bird life is very plentiful, particularly the grouse species.

Mount Revelstoke maintained its popularity as a ski-ing centre, and attracted many skiers throughout the winter months. The new downhill ski course, on which minor improvements had been made, was extensively used.

Point Pelee National Park

Not many in Canada, and fewer elsewhere, know that the southernmost part of this Dominion is in almost the same latitude as the northern boundary of California. Yet such is the case. That southernmost part extends into Lake Erie, and has been set aside as Point Pelee National Park. It has an area of only 6·04 square miles, but includes some fine sand beaches and is a noted resting-place for migratory birds. The park was established in 1918. It is equipped with a suitable camp-ground and is one of the popular summering-places of the Dominion.

Again there was a considerable decrease in the number of visitors as compared with the previous year. Tourist figures for 1939-40 are: Canadian motor vehicles, 16,209 carrying 56,732 passengers; United States motor vehicles, 22,146 carrying 77,510 passengers; a combined total of 38,355 motor vehicles and 134,242 passengers, compared with 62,052 motor vehicles and 203,180 passengers during the previous year. Camping permits issued during the year totalled 1,001, an increase of 100 as compared with last year.

Improvements carried out during the year included the following: completion of entrance arch and landscaping of adjacent grounds and alteration of Post property house to provide living quarters for the Superintendent and the Royal Canadian Mounted Police. The main road was prepared for hard-surfacing. The system of groins installed in 1937-38 to protect the east beach from erosion has given very satisfactory results, and has helped maintain a wide beach where formerly the shore-line was fast receding before the pounding of heavy seas.

Wild life within the park has flourished during the past year. Small mammals such as rabbit, squirrel, groundhog, racoon, fox, and muskrat are all plentiful. Point Pelee, located on one of the main routes followed by migratory birds, is also an important bird sanctuary and, during the migration period in the spring and autumn, is visited by many kinds of waterfowl, including duck, geese, and swan. Other birds frequenting the park during the summer include the mocking-bird, cardinal, Carolina wren, and blue-winged warbler. Quail and pheasant are also reported to be plentiful.

During the year three scientists—a botanist, a forester, and an ornithologist—made an investigation of the park for the purpose of determining how best to preserve its unique plant and animal life. A comprehensive report was prepared, recommending the fencing of certain areas for this purpose. The report also dealt with other subjects, including the prevention of windfalls and sandblow.

Prince Albert National Park

Almost in the geographical centre of the Province of Saskatchewan is Prince Albert National Park, a region of rocks, woods, and water as much unlike the popular conception of Saskatchewan as it is possible to be. More than any other of Canada's National Parks, Prince Albert is a lace-work of lakes and streams; nowhere has the original atmosphere of the area lying between the Prairie and the Great North been more faithfully preserved.

Prince Albert National Park has an area of 1,869 square miles and was established in 1927. It is reached by means of a good highway from the City of Prince Albert, 36 miles to the southward. There are good park roads to principal points of interest but the chief mode of travel is by water. The town-site of Waskesiu, where the park headquarters are located, is a popular summer resort and has an up-to-date camp-ground. The principal recreations are golf, tennis, fishing, bathing, canoeing, and boating. There are 63 miles of motor highways, 75·8 miles of secondary roads, and 390 miles of trails. The average altitude of the park is about 1,800 feet above sea-level.

Registration of visitors at the park entrance was well maintained but shows a slight decrease from last year. A total of 7,175 motor vehicles and 27,367 persons entered the park, as compared with 7,914 motor vehicles and 29,727 persons last year. Although the greater number of these visitors were residents of Saskatchewan, tourists from 6 other Canadian provinces and 26 States of the Union were among those who registered.

During the year a total of 10,230 licences and permits were issued, as follows: golf permits, 4,109; camping permits, 1,410; motor licences, 4,432; hay permits, 55; timber permits, 95, and miscellaneous, 129.

In general, health conditions in the townsite throughout the season were excellent. The usual precautionary measures against disease were taken and periodic inspections were made of all Government camps and public buildings.

The number of visitors making use of the camp-grounds totalled 12,014, as compared with 7,057 during the previous year. Registrations at the various camp-grounds were as follows: Waskesiu, 10,809; Crean Lake, 888; Kingsmere Lake, 295, and Sandy Lake, 22. Motor vehicles numbered 2,646, an increase of 790 over last year.

A new camp-site area was cleared at the end of the Narrows road and a picnic fireplace and camp kitchen were erected. At Paignton Beach construction included a dock, a combination camp-stove and fireplace, and other conveniences.

Building activity in Waskesiu townsite was as follows: the camp-ground registration office was moved to a new site; 1 large log relief building was converted into a storehouse for tools and equipment; a new blacksmith shop was erected and the interior of the Superintendent's residence was remodelled; a floor was laid in No. 2 bunkhouse and the walls sheeted with fabricated board. Under private enterprise, 4 cabins and 1 service building were erected at the Waskesiu bungalow cabins; 4 cabins were erected at the Hillcrest Auto Bungalow Camp, and 1 cottage on Lot 17. Outside of the townsite, a new warden's cabin was erected in District No. 4; 2 log shelters were erected on the golf course; an entrance way was constructed at the southern entrance to the park and 3 old buildings at Camp 10, and all buildings except 1 at Camp 9 and 1 at Camp 11 were demolished.

A combination dam and bridge was constructed over the Waskesiu River where it crosses the Heart Lakes road. The dam, which is of the stop-log type, is intended to raise and maintain the level of the water in Waskesiu Lake by approximately 2 feet. A small dam was built at the outlet of Bear Trap Lake for the purpose of diverting the water from this lake into Waskesiu Lake, and minor repairs were made on the Anglin Lake and Kingsmere River dams.

Other improvements included installation of the chlorinating plant which was purchased for the water system last year, and construction of an incinerator and sewage chute.

Improvements carried out on the Prince Albert Park Highway included relocation and revision of the highway in the vicinity of Spruce River and construction of a new bridge across Spruce River. On the Narrows road, a one-way traffic lane was constructed at Narrows Beach; on the Heart Lakes road, 480 lineal feet of guard-rail was constructed and 200 feet of narrow fill widened. The Rabbit Boundary road was generally reconditioned; the right-of-way on the road to the incinerator was widened, and 5 miles of the old road to Waskesiu was improved for fire protection purposes. Three-quarters of a mile of new trail was constructed at the First Narrows, Waskesiu Lake. The entire telephone system was gone over and thoroughly reconditioned.

With the exception of a short period in July and another in the autumn fire hazard conditions were fairly normal throughout the season. A total of 14 fires occurred within the park and burned over an area of 87 acres, as compared with 8 fires and 67 acres burned in 1938. All of these fires were extinguished before any serious damage was done. The new lookout towers which were erected in 1938 were of great assistance in the detection of fires.

A fireguard 241 chains long and from 40 to 66 feet wide was constructed to protect the townsite from fire on the north and east sides. Fire weather recording stations were set up at 4 points during the summer.

Work carried on included operation of municipal services and maintenance of streets, walks, grounds, and flower-beds. The area surrounding the community hall was landscaped; a fire weather station was established at old Camp 7; a combination foot and bridle path three-quarters of a mile long was constructed along the beach from the Lakeview subdivision, and a 475-foot ditch was dug on the fireguard between the Heart Lakes road and Waskesiu Lake.

Nearly all of the larger animals show small decreases from last year. Among the smaller animals the most notable increases are in beaver, rabbit, and muskrat. Reports indicate that the woodland caribou is more numerous than usual, and that these animals are ranging farther south than they have in the past. It is interesting to note that the common rat has made its appear-

ance in certain areas of the park. Timber wolves are reported to be numerous and coyotes scarce. All species of bird life are plentiful with the exception of ptarmigan. The most apparent increases are in Hungarian partridge, spruce partridge, pin-tailed grouse, ducks, pelicans, and cormorants.

Because of insufficient pasturage in the enclosure 7 baffalo were slaughtered in November, reducing the herd to 5. The remaining animals all came through the winter in good condition.

The program of stocking Waskesiu Lake with smallmouth black bass was continued with the arrival of a shipment of 135 mature fish early in June. These fish were transferred to specially prepared enclosures and spawned early in July. Approximately 38,650 fry were obtained which were distributed as follows: Upper Waskesiu Lake, 19,400; Heart Lakes, 9,250; 10,000 were retained in the feeding enclosures and released in Waskesiu Lake early in August.

Fairly good catches of great northern pike and pickerel were reported from Waskesiu, Heart, and Crean Lakes. Excellent trout fishing was reported from Wassigam Lake, but because of its inaccessibility by land only a few parties fished in this lake.

During the latter part of May all mosquito breeding spots in the vicinity of the townsite were sprayed with oil. Control work included a considerable amount of ditching to provide drainage in low spots.

Approximately 500 white spruce and jackpine and 250 Colorado spruce were planted in the townsite and 125 white spruce and jackpine in the camp-site. Sanitation and release cuttings were carried out on areas totalling 42 acres in the vicinity of the townsite; 115 acres along the Prince Albert Park highway, and 22 acres on the Narrows road.

The golf course continued to increase in popularity, with the number of permits issued passing all previous records. A total of 3,751 single-round tickets, as well as 252 daily, 82 weekly, 6 monthly, and 18 seasonal tickets were issued. The fifth annual Lobstick Golf Tournament was held from August 6 to 12, and had a record entry of 192. Other events of interest included the senior and junior tennis tournaments, that were held from July 29 to 31, and the annual swimming meet, that was held on August 5 and drew 63 entries.

Prince Edward Island National Park

Prince Edward Island National Park consists of a strip of coastline more than 20 miles in length on the northern shore of Prince Edward Island. It includes some of the finest sand beaches in Eastern Canada, where the water is warmer than on beaches hundreds of miles further south, and on its landward side has a delightful pastoral background. A new park, it is being developed as a recreational area in keeping with national parks standards, and already affords excellent facilities for golfing, bathing, and general summer outside life. It lies within less than an hour's motor drive of the City of Charlottetown.

With voluntary registration at Dalvay House and Green Gables as a basis, it is estimated that approximately 35,488 persons entered the park. This represents a considerable increase over the corresponding period last year, when it was estimated that 10,000 persons visited the park.

Licences and permits issued during the year totalled 29, as follows: business licences, 3; hay permits, 22; grazing permits, 3, and special permit for occupancy of property, 1.

The bath-houses at Dalvay and Cavendish were open throughout the season, and those at Brackley Beach from July 18. All bath-houses are equipped with electric light and water services.

New construction and improvements included the following: at Dalvay House construction of a new stairway to the third floor and an addition to the kitchen. At the Superintendent's residence, installation of lighting fixtures,

screen doors, windows, and storm windows throughout. At the Administration building, Dalvay House; wiring 3 offices and panelling the walls with fabricated board; and installation of oil-burning furnacette. A combined pump-house, workshop, storehouse, and garage was constructed at Dalvay, and a pump-house with storeroom at Brackley Beach. Pumping equipment was installed at Dalvay and Brackley Beach and the necessary pipe-lines laid. Kitchen shelters were constructed at Dalvay, Brackley, and Cavendish. Improvements to the house at Green Gables included the completion of plumbing; installation of a septic tank, and a new pump and kitchen range. Construction of a golf club-house and equipment storehouse at Cavendish was well advanced.

The Maritime Electric Company completed the construction of a transmission line to the Park headquarters at Dalvay, with an extension across Dalvay Lake to the summer residence of the Hon. George D. DeBlois. Lines to Dalvay House, the Superintendent's residence, and Dalvay bath-house were completed by the Department.

Landscaping of the grounds around Green Gables was carried out under contract. Approximately 6,732 feet of boundary fence was erected in the Brackley and Dalvay areas.

Work on roads included maintenance of existing roads, gravelling of 1 mile of the Tracadie-Stanhope road, and construction to grade of approximately 1 mile of new road in the Brackley Beach area.

Wild life in this area is limited mainly to waterfowl and shore and land birds. During the past year an increase has been noted in the number of Canada geese, ruffed grouse, and Hungarian partridge. Black ducks were numerous and many of these nested within the park and remained throughout the winter. During the autumn and early winter flocks of from 50 to 500 Canada geese were seen in the Brackley and Cavendish areas. A few English pheasants spent the winter in the vicinity of Green Gables.

A biological survey of park waters was carried out by Drs. A. H. Leim and M. W. Smith of the St. Andrews Biological Station.

Construction of an 18-hole golf course, started last year, was completed in September, and the first 9 holes were open for play on July 19. The golf course utilizes the area made famous by the novels of L. M. Montgomery; the old "Green Gables" farmhouse has been repaired and redecorated and every effort was made to retain as much as possible its original style as a feature of romantic and literary interest. Skirting the sand dunes and stretching back into the beautiful countryside, the new course combines the qualities necessary to ensure its popularity. After its opening on July 19 a total of 637 round-tickets, as well as 9 daily and 2 weekly tickets were issued.

Riding Mountain National Park

Riding Mountain National Park is a rolling woodland plateau some 2,200 feet above sea-level located in the southwestern part of Manitoba. Its southern edge is only about 100 miles from the International Boundary. It is an important big game sanctuary, containing the largest herd of wild elk in Canada, and substantial numbers of moose, deer, and buffalo. The headquarters of the park are at Wasagaming, on Clear Lake, a beautiful body of water which has become very popular as a summer resort. Many other lakes throughout the park offer variety and solitude. Motor camp-grounds are provided, and the principal recreations include golf, tennis, bathing, riding, hiking, and fishing. There are 50 miles of motor highways, 119 miles of trails, and 70 miles of secondary roads. The park was established in 1929.

Registration of visitors at the park entrance gates was as follows: Canadian motor vehicles, 34,636, carrying 124,471 passengers, and United States motor vehicles, 1,389, carrying 5,375 passengers, making a combined total of 36,025 motor vehicles, carrying 129,846 passengers, as compared with 33,212 motor vehicles and 124,459 passengers during the previous year. This represents an increase of 2,813 cars and 5,387 persons and establishes a new high record for the park.

Licences and permits were issued as follows: business licences, 171; building permits, 12; camping permits, 1,501; lot rentals, 220; grazing permits, 136; hay permits, 391; timber permits, 1,335; transient motor licences, 18,486; and miscellaneous, 32; total, 22,284. This represents an increase of 279 as compared with last year.

The camp-grounds at Wasagaming were well patronized, a total of 5,334 persons being accommodated, as compared with 4,761 persons in 1938-39. A total of 48,658 person days were spent in camp, averaging 9·71 days per person. The camp and picnic grounds at Lake Katherine and Moon Lake were well patronized for picnic purposes, but very little camping was done at either point.

Building by private enterprise in the townsite was confined to general improvements, re-decoration of existing buildings in the business section, construction of 5 new cottages, and improvements to existing cottages in the residential section. New construction undertaken by the Government included a new comfort station in the townsite; a new warden's cabin in the Grandview district; a new log stable near the Seech Tower; a dam 135 feet long on the Little Saskatchewan River at the outlet of Lake Audy; a bridge 32 feet long across the river 100 feet south of the dam, and a rock-filled wharf 132 feet long in Lake Audy. The warden's cabin in the Whirlpool district, which was located outside the park, was moved to a new location in Wasagaming townsite. A new camp-ground comprising about 3 acres was cleared on the east side of Lake Audy, and a kitchen, well, and 2 small comfort stations constructed.

During the season approximately 3½ miles of No. 10 highway, extending from the south gate to the golf course, was hard-surfaced. Other new work undertaken included completion of 8·5 miles of secondary road from Lake Audy to the Rossburn cabin, and 7·5 miles of secondary road on the Rossburn-Birdtail Valley section. General maintenance was carried out on all roads.

Six miles of new trail were constructed in the forest experimental area north of Clear Lake. New construction of telephone lines included 22·5 miles of line on the Central road, and from Lake Audy to the Seech Tower.

As an addition to the fire protection system, four fire-weather recording stations were established early in the season. At these stations observations of weather factors are recorded each day and the degree of fire hazard determined. Three secondary towers were erected, one 60-foot steel tower and two wooden towers, 30 feet and 40 feet in height. Two and a half miles of fireguard were constructed along the south boundary of the park, west of Crawford Park.

Work in the townsite included operation of municipal services, and maintenance of streets, walks, grounds, lawns, and flower beds. The junction of Wasagaming and Ta-Wa-Pit Drives was widened, and grounds in the vicinity of the golf club-house, Superintendent's residence, and bubbling spring were well kept. There are at present 183 privately owned cottages, 23 business establishments, and a number of government buildings within the townsite.

The park museum was open to the public daily, and during the season a considerable number of additional specimens were mounted and placed on exhibit.

All wild life within the park is in good condition and is flourishing. The past winter, with sub-normal snowfall, moderate temperatures, and abundant feed available, has been very favourable for wild life. Moose, elk, and white-tailed and mule deer are in excellent condition and increasing normally. New beaver colonies have been observed at various points in the park, and other small fur-bearing animals appear to be normal. Coyotes were present in average numbers. The animals in the enclosure at Lake Audy came through the winter well, and at the end of March numbered 160, as follows: buffalo, 60; moose, 3; elk, 84; white-tailed deer, 7; and mule deer, 6. To avoid overcrowding in the enclosure, 18 buffalo were slaughtered in the autumn and the meat and hides disposed of by contract.

Bird life was plentiful with a noted increase in ruffed grouse and prairie chicken. Migratory waterfowl showed a marked increase, and included whistling swan, geese, cormorant, and many species of duck. A list of birds of the park was compiled by P. A. Taverner and R. Sutton. One hundred and sixty species of birds are recorded for the park.

During the early part of June, 250,000 rainbow trout were received from the Provincial Hatchery at Fort Qu'Appelle and transferred to the fish-rearing ponds on the north side of Clear Lake. The fish remained in the ponds until October, when they were transferred to Clear Lake. The grounds adjacent to the ponds have been improved; a large number of plants and shrubs were set out, and a number of benches and small bridges were built. Fishing in Clear Lake continued to improve, with many good catches of northern pike being reported. On several occasions pike weighing up to 24 pounds have been taken.

Cutting of saw-timber and fuelwood in the park was again carried out under the budget plan adopted in 1937. In comparison with 1938-39, this year's cut showed a slight decrease, particularly in the amount of fuelwood taken out. The following silvicultural work was carried out under the supervision of the Dominion Forest Service; sanitation cuttings over an area of approximately 423 acres, 326 acres of which were along the Dauphin Highway, 11 acres in the vicinity of Lake Audy, and 86 acres in the townsite. In addition, a total of 20,227 young trees were planted, 425 of which were in the camp-grounds, and 19,802 in the vicinity of the golf course. The Dominion Forest Service established a forest experimental area in the park, with headquarters a short distance east of the townsite. Several buildings were erected, and an area of 15 acres cleared and prepared as a nursery.

The golf course continued to be one of the main attractions and late in the autumn the extension of the water service to include the fairways was completed. Tickets issued during the season included 5,670 single-round, 98 daily, 42 weekly, 3 monthly, and 8 seasonal tickets. The Wasagaming Golf Club Tournament in which 118 players competed was held in July. The tennis courts at Wasagaming were improved during the spring. The seventh annual tennis tournament sponsored by the Wasagaming Board of Trade was held during August, and attracted 250 players. In addition, 2 tournaments, open only to summer residents of the park, were held, and attracted 100 competitors. Saddle horses were available, and riding was freely indulged in by visitors. Swimming and boating at Clear Lake were under the supervision of a lifeguard. The third annual regatta sponsored by the Wasagaming Board of Trade was held in July.

St. Lawrence Islands National Park

St. Lawrence Islands National Park is composed of thirteen islands among the "Thousand Islands" of the St. Lawrence River, together with a small mainland area at Mallorytown Landing, Ontario. The islands include Cedar

near Kingston; Aubrey, Mermaid, Beau Rivage, Camelot, Gordon, and Endymion, near Gananoque; Georgina and Constance, near Ivy Lea; Grenadier (portion) near Rockport; Adelaide, near Mallorytown Landing; Stovin, near Brockville, and Broder, near Morrisburg, Ontario.

These island parks are delightful recreational areas for campers and picnickers, and offer ample opportunity for camping, swimming, and fishing. Necessary development work has consisted of the construction of pavilions, shelters, camp-stoves, wharves, picnic tables, benches, and other conveniences. Each island or group of islands is in charge of a caretaker, who is responsible for the care and maintenance of the docks, shelters, camp-stoves, and other conveniences. Several of the larger islands, notably Beau Rivage, are used extensively for summer camps by Girl Guides and similar organizations. The park was established in 1914, and contains 185·6 acres.

Although an actual count is not feasible, it is estimated that 21,600 persons visited the island parks during the year, as compared with 21,150 during the corresponding period in 1938.

Waterton Lakes National Park

(Canadian Section, Waterton International Peace Park)

Waterton Lakes National Park is located in the extreme southwestern corner of Alberta, on the eastern slopes of the Rocky Mountains, and immediately adjoins Glacier National Park in Montana, with which it forms the Waterton-Glacier International Peace Park. The park is noted for the beauty of its lakes and the remarkable colouring of its rocks and mountains. It presents an interesting and varied flora and fauna and opportunities for such forms of recreation as swimming, boating, hunting, climbing, riding, golf, fishing and tennis. Accommodation is provided by 2 hotels, an auto-bungalow camp, several boarding and apartment houses, and a government motor camp-ground. Motor highways have a total length of 44·5 miles and trails 243 miles. The park was established in 1895 and has an area of 220 square miles.

There was a noteworthy increase in the number of visitors entering the park as compared with last year. Registrations at the park entrance gates were as follows: Canadian motor vehicles, 17,360, carrying 67,865 passengers; United States motor vehicles, 11,541, carrying 40,355 passengers; foreign motor vehicles, 106, carrying 307 passengers. Combined total, 29,007 motor vehicles, carrying 108,527 passengers, as compared with 23,223 motor vehicles carrying 86,517 passengers last year. This represents an increase of 25 per cent over the previous high which was established in 1938.

The Information Bureau was opened on June 15 and closed on September 4. During the period 12,782 inquiries were dealt with. This total was made up as follows: Canadian, 5,375; United States, 6,907; foreign, 67, and miscellaneous, 433.

A total of 13,990 licences and permits were issued as follows: general receipts, 469; general licences, 137; building permits, 21; timber permits, 52; camping permits, 525, and transient motor licences, 12,786. This represents an increase of 18·8 per cent in revenue over the 1938 figure, the greatest individual increase being in transient motor licences.

Health conditions throughout the year were generally good. All milk and water supplies were subject to frequent tests by the Provincial Laboratory at Edmonton. Regular inspections were made of storage facilities for perishable foods, and close supervision maintained over all matters affecting public health.

Registration at the main park camp-grounds totalled 1,837 persons, as compared with 1,709 persons last year. A total of 448 camping permits were issued, covering a combined stay equivalent to 12,379 person days or an average stay of 6·6 days per person. The camp-grounds at Cameron Lake and Red Rock Canyon continued to be popular. A caretaker was employed for two months at each of these camp-grounds.

Work on government buildings was restricted to general maintenance. Under private enterprise, work in the townsite was continued on the apartment building in Block 2; the new dance hall was completed; 2 new cottages were erected and 1 is in course of construction. New buildings outside of the townsite included a new unit of 6 cabins at the auto bungalow camp at Cameron Lake.

Work on roads was confined to general maintenance, minor repairs, and hard-surfacing of the Chief Mountain International Highway. The hard-surfacing of this highway, from the International Boundary to the Waterton River bridge, was completed during the summer, providing a fine surfaced road between the International Boundary at Chief Mountain and Banff National Park via Calgary. On the Main Entrance road, in addition to general maintenance, revisions were carried out on the first mile in preparation for hard-surfacing. Widening was undertaken on the Pincher road near the Registration Office. The Akamina road was widened near Cameron Lake. On the golf course road a dangerous curve was eliminated at the junction of the approach to the Prince of Wales Hotel with the Main Entrance road. The new bridge over Lower Cameron Creek was completed and the bridges across Indian and Crooked Creeks on the Chief Mountain International Highway were redecked.

Toward the end of the season, work was commenced on the widening of Pincher Creek Avenue at the entrance to the townsite, by constructing a new rock retaining-wall along the lake.

New construction of trails was restricted to 2·25 miles on the Lone Lake Trail, from South Kootenai Pass to Lone Lake at the head of Blackiston Creek; completion of the trail around the Prince of Wales Hill, 0·15 miles; a trail down the south side of Prince of Wales Hill to Pincher Creek Avenue, 0·25 miles, and a trail from Prince of Wales Hotel to Lake Linnet, 0·25 miles.

Work on telephone lines was restricted to general maintenance of existing lines, and construction of 2·5 miles of new line from Hell Roaring Cabin to the townsite line at the Narrows.

At Cameron Falls, the flow of water was diverted back to its former channel, and the natural beauty of the falls preserved. Other improvements included repairs to the Government wharf which was damaged by ice last winter; planting of lawns in the vicinity of the fish ponds near Cameron Falls, and completion of the wharf which the Park Transport Company started last year. Other work included operation of municipal services, and maintenance of streets, walks, grounds, lawns, and flower beds.

All wild life in the park has done well during the past year. Increases have been noted among mule deer, Rocky Mountain sheep, beaver, snowshoe rabbit, and elk. White-tailed deer and Rocky Mountain goat appear to be in a healthy condition, but have not shown any increase. Moose have been seen in the Cameron Lake and Pass Creek areas, but it is thought that these animals strayed in from British Columbia and do not habitually stay in the park. Other animals which have been seen frequently are: badger, black bear, grizzly bear, red fox, lynx, marten, mink, muskrat, otter, porcupine, skunk, weasel, and marmot. Among the predators, coyote are numerous, and 1 cougar and tracks of lynx were seen. Small birds appear to be increasing in the vicinity of the townsite. Ruffed grouse and prairie chicken seem to be increasing slightly, although the broods this year were smaller than the average. Large flocks of migrating ducks, Canada geese, and about 80 swans were seen on the Lower Waterton and Maskinonge Lakes, and at least 2 geese wintered in the park. The spring migration of waterfowl was first noticed on March 12 when large flocks of Canada geese arrived on Maskinonge and Lower Waterton Lakes. Swan and duck were first noticed on March 24. A list of birds which included one hundred and thirty species known to have visited the park was compiled at Head Office.

Fishing in park waters was good, and excellent catches were reported throughout the season. Bertha and Cameron Lakes were probably the most popular, the latter being easily accessible from the townsite. Results of stocking have been remarkably good in these lakes.

The following distribution of fry and fingerlings was made from the Waterton Fish Hatchery: In park waters—cutthroat trout, 40,192; rainbow trout, 62,124; speckled trout, 14,097; combined total, 116,413; in provincial waters, 589,162. A total of 60,704 rainbow trout fingerlings and 81,580 speckled trout eggs was carried over the winter. Improvements carried out at the hatchery included construction of a small building at the rear of the garage to house the food chopper, and installation of a small waterwheel to supply the power. The original flagstone walk leading to the main entrance was rebuilt, a box screen was erected at the outlet of the supply reservoir, and, to improve oxygenation, 5 cone sprays were installed at the inlets of the 5 ponds.

In spite of the extremely dry, hot weather that was experienced, the park golf course was maintained in good condition with 18 holes in play throughout the season. In the autumn preliminary work was started to prepare some of the greens for conversion from sand to grass. The annual golf tournament, sponsored by the local Board of Trade, in which 106 players competed was held on August 13 and 14. The 4 tennis courts were in almost continual use. The baseball diamond was kept in good condition, but did not receive the same patronage as in former years.

Yoho National Park

Outstanding among the scenic mountain regions of the continent is Yoho National Park, located on the western slope of the Rockies, and immediately adjoining Banff and Kootenay National Parks. It contains the famous Yoho Valley with its numerous waterfalls; the Kicking Horse Valley, and Lakes Emerald and O'Hara, and justifies the Indian word "Yoho", an exclamation of wonder and delight. Headquarters of the park are located at Field, just west of the confluence of Yoho and Kicking Horse Rivers. The park has 44 miles of motor highways and 192 miles of trails. It was established in 1886 and has an area of 507 square miles.

Continued improvement is shown in tourist travel to Yoho Park, the number of visitors during the season again showing an increase over the previous year. Traffic from Banff by way of Kicking Horse Pass, which is not registered at the Leanchoil Gateway, was recorded by an automatic registration device installed west of the park boundary near Hector.

Tourist figures for the past two years are given in the following table:—

Route	Motor Vehicles		Passengers	
	1939-40	1938-39	1939-40	1938-39
Eastbound—				
Via Leanchoil Gate	2,232	1,890	6,259	5,861
Westbound—				
Recorded automatically (estimated 4 persons per car)	13,445	12,954	53,780	51,816
Visitors by rail (estimated)	.....	.....	7,500	7,000
Totals	15,677	14,844	67,539	64,677

During the year a total of 377 licences and permits were issued, as follows: business, 3; chauffeur, 17; dog, 41; motor livery, 32; saddle horse, 45; transient motor, 136, and miscellaneous, 103.

The health of persons resident within the park was, in general, good. Throughout the season regular inspections of public camp-grounds and business premises were made by a medical health officer.

The number of persons making use of public camp-grounds showed a slight increase over last year. Registrations at the Field, Kicking Horse, and Chancellor Peak camp-grounds totalled 1,092 motor vehicles, carrying 4,263 passengers. This represents an increase of 106 motor vehicles and 319 passengers over the corresponding period last year. The Emerald Lake Chalet, Wapta Lodge, Lake O'Hara Lodge, Yoho Valley Lodge, Mount Stephen Auto Bungalow Camp, and tea rooms at Twin Falls and Cathedral, were all open throughout the season.

New construction carried out during the year included a new community building at the Kicking Horse camp-ground; two comfort stations near Emerald Lake, and a new gateway at the west boundary. In addition, the Alpine Club of Canada erected a new cabin in the Little Yoho Valley. As a means of flood control, the bed of Mount Stephen Creek was cleaned out and the bank on the town side reinforced with a stone and concrete wall for a distance of about 300 feet.

Work on park roads was limited to general maintenance and minor repairs. Parking areas at Emerald Lake and the Natural Bridge were widened. In the townsite of Field all streets were graded and oiled, and a new emergency railway crossing was constructed just west of the depot. The Lake O'Hara trail was widened and graded and is now passable for light cars. Corduroy was also replaced on the Ice River and Fossil Bed trails. The forest telephone line from Chancellor Peak camp-ground to Misko was relocated; new poles were installed and copperweld wire used to replace the old galvanized iron wire between Field and a point 3½ miles east.

Wild life in the park is plentiful and in good condition. Small fur-bearing animals are maintaining normal increases, and beaver are particularly active near Ottertail. Fishing continued to be popular, with some good catches reported from Lakes O'Hara and Wapta. Restocking of park waters with rainbow trout from the Banff Hatchery was continued.

The outstanding event of the season was the visit of Their Majesties the King and Queen, who motored through from Banff to Field, where the Royal train was waiting.

Animals Parks

Buffalo National Park

Buffalo Park, near Wainwright, Alberta, is the largest fenced wild animal preserve in Canada. It has an area of 200·5 square miles and was established in 1908 to provide range for the then newly acquired Pablo buffalo herd. It has also housed various other game species, and has been used for cross-breeding experiments with buffalo, cattle, and yak.

Permits for 24 cords of dry wood, and 8,000 willow pickets were issued to local settlers.

All telephone work was confined to general maintenance and included replacement of 65 poles, resetting of 34 old poles, and replacement of a number of side brackets. Maintenance and repairs were carried out on approximately 120 miles of eight-foot, and 10 miles of ordinary fence. Repairs included replacement of 2,062 fourteen-foot posts, and resetting of 1,599 old posts.

As a means of protection against fire, approximately 140 miles of 20-foot fireguard was ploughed on both sides of the main fence, and also across the park and around buildings and feed corrals.

New construction included a small registration booth at the Hardisty Gate, and a cook's caboose for the use of the fencing gang.

For a number of years the population of large animals has had to be reduced by slaughtering, which has been carried out nearly every year, in order to keep the herd within the grazing limits of the area. In spite of this the range has deteriorated and inspections carried out at the slaughters have shown the presence of diseases and parasites which, while they could be kept at a low ebb by annual slaughters, could never be entirely eliminated in this way.

During the year a careful investigation of the animals and range was made, and it was decided that the only sound course of action was to slaughter all of the larger animals in the park. In this way the range can lie fallow for a few years, eliminating disease completely and allowing the range to recover.

Following the same procedure as in previous years, the buffalo slaughter was carried out under contract which included the disposal of all products except 500 hides which were reserved for the Royal Canadian Mounted Police. Slaughter of elk, moose, deer, and yak was carried out under the direction of the Superintendent and the meat and hides were shipped to agents of the Indian Affairs Branch at various points in the Prairie Provinces. Animals of all species were inspected by meat inspectors of the Department of Agriculture. In all, 2,918 buffalo, 1,806 elk, 113 moose, 242 deer, and 12 yak were slaughtered.

In carrying out this important work exceptionally favourable weather was enjoyed. This made it possible to carry out the slaughter efficiently to the degree of completeness necessary to achieve its purpose.

As a precaution against the possible recurrence of encephalomyelitis which caused such a heavy loss among horses in Western Canada last year, all park horses were vaccinated and no losses occurred. Assistance was also given to the Department of Agriculture in its cross-breeding experiments at the catallo enclosure.

More water in the sloughs than has been recorded for some years resulted in a large increase in the number of mallard and other ducks. An increase was also noticed in pintailed grouse and Hungarian partridge.

Farming operations included the growing of oats and hay, and the harvesting of wild or meadow hay. Approximately 450 acres were under cultivation, of which 320 were sown to oats, and 130 to brome grass with a nurse crop of oats. Returns from this operation were as follows: oats, 9,023 bushels; straw, 100 tons; green feed, 71 tons; crested wheat grass seed, 850 pounds; hay (wild), 1,055 tons, (cultivated), 222 tons.

Elk Island National Park

Within an hour's drive of Edmonton, and in almost the exact centre of Alberta, is Elk Island National Park, a region of well-timbered knolls and coulees, meadows and lakes. The park is completely fenced and is the principal home of Canada's national buffalo herd. It is a natural range for elk, moose, and mule deer, and a favoured breeding ground for waterfowl. A recreation area has been developed and opportunities provided for golf, camping, bathing, and boating.

Elk Island National Park was established in 1911 and has an area of 51·2 square miles. It contains 18 miles of motor highways and 4 miles of trails. Although originally intended primarily as a big game reserve, this park has in recent years developed also into a popular recreational resort.

A total of 53,821 persons visited the park during the year, as compared with 73,056 for the corresponding period in 1938-39. The total number of motor vehicles was 12,815. The decrease in tourist traffic of approximately 26 per cent is attributed to the wet weather which prevailed during the late spring and early summer, and to some extent to the charging of an entrance fee.

Licences and permits issued during the year totalled 98, as follows: boat livery, 6; tea room, 2; camping permits, 88, and miscellaneous, 2.

Health conditions throughout the season were good. Periodical examinations were made of the various wells supplying water, and bacterial analyses made. All milk sold within the park was provided from tested herds.

A new camp-ground and picnic area was constructed at Sandy Beach on the east side of Astotin Lake. Winding roads and sandy paths were laid out leading to all parts of the area. Ample space was provided for tents, and extensive parking areas for cars. The camp-ground on Long Island was occupied for two weeks by the Long Island Bible Camp which accommodated over 1,000 visitors. The Vegreville Boy Scouts camped for two weeks on Archer's Island, the Y.M.C.A. on Elk Island, and the Northern Alberta C.G.I.T. and Tuxis Rangers at the south end of the lake.

New buildings included the following: at Sandy Beach, a refreshment booth, a new floating dock, 2 kitchens and 2 comfort stations completed; 2 kitchens and 2 comfort stations partially completed, and 2,095 lineal feet of guard-rail; 3 new shelters on the golf course and a new foot-bridge 725 feet long to Long Island.

General maintenance of roads was carried on throughout the season and included resurfacing with gravel where necessary; widening inside the north, south, and east gates for a distance of 100 yards; riprapping the ditches with stone; and erecting gates at the north and south entrances. New work undertaken included a 2,200-foot diversion of the main highway through Sandy Beach; construction of approximately 1½ miles of new road through the camping and picnic areas; construction of a bridge over the inlet to Astotin Lake, and 15 culverts at different points on the main highway. There were 725 yards of new trails constructed in the new camp and picnic grounds. The main park telephone line was reconstructed over a distance of 9½ miles, from the west gate through headquarters to the south gate.

The large animals in the park, which include buffalo, moose, elk, and deer, have come through the year in good condition. Increases during the year included 110 buffalo, 30 elk, and 15 moose. At the close of the fiscal year the numbers of animals in the park were: buffalo, 1,084; elk, 488; moose, 113; and mule deer, 27. Twenty head of buffalo, made up of 16 cows and 4 bulls, were donated to the Ontario Provincial Government, and shipped to Burwash, Ontario.

Among the small animals found in the park are weasel, porcupine, muskrat, red squirrel, flying squirrel, chipmunk, snowshoe rabbit, and gopher. The only predatory animals are coyotes, which are comparatively scarce. Bird life was abundant, with several new species being identified in the park for the first time. The colony of blue herons which for some years has been nesting on an island in Astotin Lake did not return in 1939. Elk Island maintained its reputation as a sanctuary for waterfowl, many species of duck as well as quite a number of whistling swan being noted. The nesting season for ducks was a successful one with many large broods being raised.

Approximately 210 acres were sown to oats; 30 acres of land were brushed and broken for seeding next year; and 100 acres of fall ploughing was done. Approximately 100 acres of oats were threshed yielding 6,803 bushels of grain and 2 large stacks of straw. From the remainder of the area 145 tons of oat sheaves were obtained. In addition, 800 tons of hay were harvested from the Goose Lake meadow.

Under a tree planting program approximately 1,450 young trees were planted, as follows: at Headquarters, south gate, and the golf course, 1,000; at Sandy Beach, 450. Over 1,000 young trees were donated to the park by the

Oliver Institute of the Provincial Forestry Department. Sanitation cuttings were carried out in poplar over 35 acres in areas adjacent to Sandy Beach. Thirty cords of dry wood were obtained from this operation.

The golf course was well patronized, but owing to adverse weather conditions in May and June, the attendance showed a small decrease as compared with last year. The Elk Island Golf Club held its annual tournament on August 20, with a total entry of 115.

Nemiskam National Park

Nemiskam National Park, Alberta, is a fenced reserve of 8·5 square miles, established in 1922 for the protection of prong-horned antelope, a species indigenous to the western plains of Canada. It is estimated that at the end of the fiscal year there were approximately 70 head of antelope in the park, all of which came through the winter in good condition. Visitors to the park during the year numbered 30.

As a result of good rains in June, range conditions showed a decided improvement, and there was sufficient grass under normal conditions to feed the antelope until the spring. Unfortunately, the first snow was followed by rain which froze the snow into a hard crust and prevented the antelope from grazing. As a result of this condition it was found necessary to start feeding the antelope in January.

Activities throughout the year included the following: repairing and maintenance of all fences; removal of weeds from fences and water courses; fencing of a 50-acre horse pasture, and a smaller enclosure for stacking rye; a new road was constructed across Chin Coulee to give access to the west side of the park, and, in addition, the small cottage, barn and coal shed were moved about three-quarters of a mile to a new site near the artesian well in the southeast corner of the park.

At one time the antelope was almost extinct in Canada and the enclosing of a small herd in Nemiskam Park represented a noteworthy achievement in conservation. Since that time the antelope have increased considerably in both Alberta and Saskatchewan. This increase has frequently been aided by the escape of surplus animals from Nemiskam over the snow drifts that form along the fence in winter. The present Nemiskam herd represents a much smaller portion of the antelope population of Canada than did the herd originally enclosed there, but the future of any big game animal in open settled country may become uncertain and the maintenance of a nucleus under constant care is highly desirable.

Historic Parks

Fort Anne National Park

This national historic park at Annapolis Royal is on the site of the early Acadian settlement at Port Royal. It contains a historical museum with a fine library. Established in 1917, the park has an area of 31 acres. Fort Anne National Park is one of the most notable of Canada's historic places. The fort to-day includes well preserved earthworks and a large building erected in 1797, during British occupation. This building was restored in 1935 and serves as a museum.

During the past year 10,116 persons visited the museum, as compared with 12,050 during the previous year. In addition it has been estimated that 7,000 persons visited the grounds without going into the museum, making a combined total of 17,116 persons to visit the park. This represents an increase of 66 persons over the corresponding period last year. Travel groups

to visit the park included delegates attending the Canadian Electrical Association Convention at Digby; doctors attending the Medical Convention at Digby; French-Canadian priests from Antigonish and Cape Breton; several groups from the United States; and teachers and pupils from Canadian schools.

Among some of the interesting acquisitions to the park museum were the following: Translation of Delabat's report on "Specifications and Estimate of Works to be undertaken for the protection of the entrance to Port Royal Harbour in Acadie"; an old document dated at Boston, December, 1755, regarding Acadians expelled from Nova Scotia being sent to different towns in Massachusetts; an old lock taken off the powder magazine in the south bastion over 50 years ago; a silver medal commemorating the visit of King George VI and Queen Elizabeth to Canada in 1939; Pierre du Gua, Sieur de Monts Records; an old French harrow, believed to be one of the earliest types of harrows used by the French in Canada; a collection of Micmac Indian handicraft exhibits; two pieces of 16th-17th Century French sabres, and a framed picture of Sir Charles Hobby who took part in the attack on Port Royal in 1710.

Detachments of the West Nova Scotia Regiment, C.A.S.F., trained on the fort grounds from September 5 to 9, which added considerably to the interest of the old fort.

Improvements carried out during the year included construction of a new wire fence between Fort Anne and the old cemetery; construction of a temporary roof on No. 2 powder magazine, and shoring up of walls on both magazines. All other work undertaken was of a general maintenance character.

Fort Beausejour National Park

The site of old Fort Beausejour, located on the long ridge between the Aulac and Missaguash Rivers, near Sackville, New Brunswick, forms one of the most interesting historic places in New Brunswick. In 1926, an area of 59 acres, containing what remained of the fort, was set aside as a National Historic Park and the original name "Fort Beausejour" was adopted.

In 1935, a museum was erected near the entrance to the fort. This building contains an interesting collection of exhibits relating chiefly to the civil and military history of Chignecto, the neighbouring Counties of Westmorland and Albert in New Brunswick, and Cumberland in Nova Scotia.

During the year, 16,589 persons registered at the museum. Work carried out included the erection of a shelter building, improvements to the existing pavilion, masonry work on the stone curtain wall, and the paving of the approach road from the main highway.

HISTORIC SITES AND MONUMENTS

The restoration, preservation, marking, and administration of historic sites of national importance and the commemoration of the public services of outstanding persons connected with the early history of Canada have been entrusted to the National Parks Bureau. The Bureau is advised in this work by the Historic Sites and Monuments Board of Canada, an honorary body comprised of a number of recognized historians representing the various parts of the Dominion.

The personnel of the Board is as follows: His Honour, F. W. Howay, New Westminster, B.C.; Dr. J. Clarence Webster, Shediac, N.B.; Professor Fred Landon, London, Ont.; Professor D. C. Harvey, Halifax, N.S.; Honourable E. F. Surveyer, Montreal, P.Q.; Reverend Antoine d'Eschambault, St. Boniface, Man.; J. A. Gregory, M.P., North Battleford, Sask.; and F. H. H. Williamson, Controller, National Parks Bureau, Ottawa.

Brigadier-General E. A. Cruikshank, Chairman of the Board since its formation, died June 23, 1939.

During the year the following memorials were erected:—

Fathers of Confederation, Charlottetown, P.E.I.—Seven bronze plates were placed on the wall of the corridor leading to the Confederation Chamber in the Province Building, to the memory of George Coles, Colonel John Hamilton Gray, Thomas Heath Haviland, Andrew Archibald Macdonald, Edward Palmer, William Henry Pope, and Edward Whelan. These were unveiled by their immediate descendants on July 17, 1939, on the occasion of the 75th Anniversary of the Charlottetown Conference.

Fathers of Confederation, Amherst, N.S.—Four bronze plates were affixed to the Post Office Building, in memory of Edward Barron Chandler, Robert Barry Dickey, Jonathan McCully, and Sir Charles Tupper, all of whom were born in Cumberland County. These were unveiled by the Chief Justice of Nova Scotia, on September 16, 1939.

Naval Encounter at Tatamagouche, Nova Scotia.—A cut stone monument with bronze tablet was erected on the Community Field, adjacent to Highway No. 6, to commemorate the events connected with the naval engagement that took place in Tatamagouche harbour on June 15, 1746. The monument was unveiled on August 30, 1939.

Sambro Island Lighthouse, Sambro, N.S.—A field-stone cairn with tablet was erected adjacent to the main highway, to commemorate the events connected with the construction of this lighthouse, which is famous in the annals of the sea. The monument was unveiled on October 13, 1939.

First Minister of Health in British Empire, Fredericton, N.B.—A cut stone monument with tablet was erected on Parliament Square, to commemorate the establishment in 1912 by the Legislature of New Brunswick of a Ministry of Health, of which Honourable W. F. Roberts became the first Minister. The monument was unveiled on September 24, 1939, by Chief Justice J. B. M. Baxter, Administrator of the Provincial Government.

James de Mille and George McCall Theal, Saint John, N.B.—Bronze plates to commemorate the achievements of these two outstanding personages, born in Saint John, were affixed to the wall of the main hall of the New Brunswick Museum building.

First Transcontinental Train, Montreal, P.Q.—A tablet was affixed to the Notre Dame Street frontage of the old Dalhousie Street Station, to commemorate the departure from there on June 28, 1886, of the first regular transcontinental train.

Ernest Rutherford, Montreal, P.Q.—A tablet was affixed to the exterior wall of the Macdonald Physics Building, McGill University, to commemorate the outstanding discoveries made by Lord Rutherford which opened new paths for the progress of science and human welfare. The tablet was unveiled on October 6, 1939.

Madame Albani, Chambly, P.Q.—A bronze plate affixed to an iron pedestal was erected on the lot in front of the house in which Madame Albani, celebrated Canadian singer, was born. The memorial was unveiled on September 14, 1939, in the presence of her son, Mr. E. F. Gye, C.M.G.

Louis Philippe Hebert, Ste. Sophie d'Halifax, P.Q.—A bronze plate affixed to an iron pedestal was erected adjacent to the main highway, to mark the birthplace of Louis Philippe Hebert, artist and sculptor.

Sir James Lucas Yeo, Kingston, Ont.—A cut stone monument with tablet was erected on the Royal Military College grounds, to commemorate the distinguished public services of Sir James Lucas Yeo, as Commander in Chief of the naval forces on the Great Lakes during the War of 1812-14.

Cornwall Canal, near Cornwall, Ont.—A cut stone monument with tablet was erected at Lock 20, adjacent to Highway No. 2, to commemorate the events connected with the construction of the Cornwall Canal.

First Lighthouse on the Great Lakes, near Niagara-on-the-Lake, Ont.—A tablet was affixed to the outer wall of Fort Mississauga, which stands on the site of the first lighthouse on the Great Lakes, built in 1804. The tablet was unveiled under the auspices of the Niagara Historical Society on October 4, 1939.

Surrender of Indian Lands, Orillia, Ont.—A cut stone monument with tablet was erected in Couchiching Beach Park, to commemorate the treaties made with the Indians in 1798, 1815, and 1818, whereby the ancient country of the Hurons lying north and west of Lake Simcoe was acquired for settlement purposes. The memorial was unveiled on October 13, 1939.

Fort Malden, Amherstburg, Ont.—A tablet was affixed to the stone gateway, at the main entrance to the grounds, to mark the site of the fort built in 1797-99 and strengthened in 1812 as the principal military station on the western frontier.

Thomas Simpson, Winnipeg, Man.—A cut stone monument with tablet was erected in St. John's Park, to commemorate the services of Thomas Simpson, who, with Peter Warren Dease, explored the Arctic Coast of America from Sir John Franklin's Return Reef to Point Barrow, the mainland shore from Coronation Gulf to Rae Strait, and the southern side of Victoria Island.

Dawson Road, Ste. Anne, Man.—A cairn with tablet was erected adjacent to the highway, to mark the land and water route from Fort William to Red River.

Fort Chipewyan, Alta.—A cairn with tablet was erected adjacent to the old buildings of the Hudson's Bay Company, to mark the site of the fort built about 1804 for the North West Company. It was transferred to the Hudson's Bay Company in 1821.

The Overland Expedition of 1862, Jasper, Alta.—A boulder with tablet was erected near the Canadian National Railways station, to commemorate the courage and daring of the parties of gold seekers who, in 1862, left their homes in Upper and Lower Canada and journeyed overland by way of Fort Garry and Edmonton to Kamloops and Cariboo.

Preservation and Development Work

Preservation and development work was carried out during the year at the following sites:—

Fortress of Louisbourg, near Louisburg, N.S.—Excavation and masonry work on the site of the Citadel building was carried on and a masonry retaining-wall constructed against the south casemates; the west wing of the hospital building was excavated to the first floor level; a new gateway was constructed and iron gates hung; a new telephone line was erected, and all exterior walls of the museum building were waterproofed.

Port Royal Habitation, Lower Granville, N.S.—The Habitation is situated on the north shore of the Annapolis Basin, 7 miles southwest of the town of Annapolis Royal, on the site of the first fort or habitation built by the French

under de Monts and Champlain in 1605. An area of 17 acres, comprising most of the original site, has been acquired, and a replica of the "Habitation" was constructed. This comprises a group of buildings arranged around a courtyard in the manner of 16th Century farms in northern France, fortified at the two southerly corners by a cannon platform and a stockade or palisade.

Fort Monckton, near Port Elgin, N.B.—A new section of sea-wall was constructed, repairs were made to the existing sea-wall, and a new angle-iron fence was erected around the cemetery.

Fort Chambly, Chambly, P.Q.—The fort is situated about 20 miles southeast of Montreal, on Richelieu River. The concrete retaining wall was extended from Pontchartrain Street to the northwesterly bastion of the fort and a ramp constructed to give access to the beach; an angle-iron fence was erected in front of the cemetery along Fort Street, and the basement of the museum building was water-proofed.

Fort Lennox, Ile-aux-Noix, P.Q.—The fort is situated 13 miles south of St. Johns, in Richelieu River. The stone walls of the officers' quarters, powder magazine, men's barracks, and the two entrances were repointed, the roofs of five of the buildings were painted, and repairs were made to the bridges over the moat.

Sir Wilfrid Laurier, St. Lin, P.Q.—The house in which Sir Wilfrid Laurier was born together with the adjacent lot, has been purchased. The brickwork of the house was repointed and the woodwork, both inside and out, put in good condition and painted. Shutters were provided for the door and window openings, and a fence erected at the rear and on two sides of the property. Suitable furnishings were purchased and placed in the house, and the grounds surrounding the building were levelled, seeded, and planted.

Fort Wellington, Prescott, Ont.—This fort is situated at the east end of the town, adjacent to Highway No. 2. A new one-way entrance road was constructed and a parking area provided on the northeast corner of the property. A new entrance gateway, consisting of two rubble stone walls surmounted with granite copings, was also constructed.

Fort Malden, Amherstburg, Ont.—A fireproof museum building was constructed. A stone gateway was erected at the main entrance from Laird Avenue, and a stone fence constructed across the front of the property. Improvements were also carried out on the grounds.

MIGRATORY BIRDS CONVENTION ACT

Responsibility for the administration of the Act based on the Migratory Birds Treaty which provides for the better protection of birds that migrate between Canada and the United States rests with the National Parks Bureau. Regulations covering the shooting of migratory birds remained practically the same with a continuation of the restrictions first imposed in 1936. In the maritime sections of Canada which have not been seriously affected by adverse waterfowl conditions the open season was extended two weeks.

Migratory Birds Convention Act

(Chapter 130, Revised Statutes of Canada, 1927, and Amendments)

On August 16, 1916, a treaty for the better protection of birds that migrate between Canada and the United States was signed at Washington, D.C. This treaty was made effective by Act of the Parliament of Canada in 1917.

The Minister is responsible to Parliament for fulfilment of Canada's obligations under the Treaty; under the Director of the Lands, Parks and Forests Branch, the Controller of National Parks is responsible for the administration of the statute, and the Superintendent of Wild Life Protection is technical adviser and executive assistant.

By virtue of Order in Council, P.C. 2283, of October 14, 1932, the responsibility for police work under the Act was transferred to the Royal Canadian Mounted Police, all other responsibilities under the Act remaining with the Department of Mines and Resources.

Protection of Migratory Birds

There has been some slight improvement in the waterfowl situation following depletion of the supply in recent years by drought and other harmful factors. This depletion, started with the prairie nesting grounds, and because of the normal migrations of these birds southward and to the Atlantic and Pacific Coasts, affected other parts of the Dominion and almost the entire United States. In the provinces bordering on the Atlantic the situation among waterfowl, with the exception of brant, might be described as highly satisfactory. In Ontario and Quebec the numerical status of the black duck remains the same, and there was little change in the numbers of most of the other ducks and geese. However, Canada geese and brant were below normal, but blue geese and lesser snow geese remained at a high level of abundance. Waterfowl nesting grounds in most of southern Saskatchewan and Alberta continued poor, but were excellent in a part of southwestern Saskatchewan where hundreds of ponds and sloughs were restored by heavy rains. In British Columbia the waterfowl situation in general is satisfactory from the standpoint of conservation. Certain of the more valuable game species, notably mallard, pintail and black brant, have increased in numbers; other species, for example canvas-back and ruddy duck, whose numbers had been seriously depleted, appear to be on the road to at least a partial recovery. Waterfowl breeding areas, so far as can be determined by early spring inspections, carry sufficient water for the requirements of propagation.

The existing hunting season of approximately two months was continued throughout Canada in 1939, except in the maritime sections where the season was extended two weeks. This relatively short season was adopted in 1936 in an effort to restore the loss in the natural supply of migratory waterfowl on the continent. The strict daily and seasonal bag limit then imposed, the bar against use of live decoys in hunting these birds, and the prohibition of baiting waterfowl with grain remain in force. Continuing the policy of recent years, no open season was allowed for wood ducks, and no hunting of Atlantic brant was permitted. The latter species has not recovered from the very serious depletion which occurred in recent years and which was presumably caused by the almost complete failure of one of its chief food plants, eel-grass. The prohibition against the sale of migratory waterfowl continued as in the past.

In the United States, restrictions on hunting waterfowl remain more stringent than those which apply in Canada, the open season there being of only one and a half months' duration. Seasons for several species were closed entirely, the hours of shooting, the possession limit, and other restrictions continued to be strict. Large sums of money were spent in that country in the establishment of bird sanctuaries especially for waterfowl and in other bird conservation work under the authority of the Migratory Birds Treaty.

A total of 56 bird sanctuaries of various types are now reserved under the Migratory Birds Convention Act in Canada, comprising an area of approximately 121 square miles. The following new sanctuaries were established during the year: Dautraie and Kingsmere in the Province of Quebec, and Big Glace Bay and Kentville in the Province of Nova Scotia. In addition, changes in the boundaries of Harrington Lake, Ile au Heron, and Whitlock Bird Sanctuaries in the Province of Quebec were made.

Twelve honorary game officers were appointed under the Migratory Birds Convention Act during the year, this making a total of 797, throughout Canada. These officers gave the usual valuable assistance, especially in educational work.

Under the supervision of four District Migratory Bird Officers, the field administration of the Act was continued. In addition to their regular work, they were able to continue the scientific study of the relation of mergansers to fishing interests on the Pacific Coast; the investigation of waterfowl conditions in the Prairie Provinces, including inspection with provincial officers of bird sanctuaries and public shooting grounds in Alberta; the annual motor-boat patrol for the purpose of inspecting breeding conditions on bird sanctuaries and elsewhere on the north shore of the Gulf of St. Lawrence; research work on the status of woodcock and also the food habits of herring gulls in relation to fish in the Maritime Provinces; and general educational work by radio talks and lectures to the public. Co-operative efforts were also carried on with the Royal Canadian Mounted Police, game conservation societies, and other organizations.

The eider-down industry of the north shore of the Gulf of St. Lawrence, in the eastern part of the Province of Quebec, which is being supervised in co-operation with the Quebec Department of Lands and Forests and Game and Fisheries, continued to expand during 1939. Twenty-six leases were in effect during the season and the production of cleaned eider-down made a substantial increase.

A total of 41,062 records of birds, newly banded in Canada, was added to the official records during the calendar year 1939, this figure being the largest since Canadian bird banding came under the direction of this Bureau. The number of records of banded birds that were recaptured, killed, or found dead has increased in proportion. These records of recovery provide the data whereby many important problems relating to wild bird life are solved, and permit proper steps to be taken towards the conservation and control of wild birds. This Bureau co-operates fully with the United States Fish and Wildlife Service, Department of the Interior, Washington, D.C., in connection with bird banding in North America. Practically all of the bird-banding work done in Canada is performed by over 200 voluntary bird-banding co-operators at their own expense and without remuneration. The number of honorary banders has continued to expand steadily since bird banding became popular in Canada.

No definite recovery has yet occurred in the supply of eel-grass, a very important natural food for waterfowl, particularly brant on the Atlantic Coast. This depletion has been caused by one of the most striking plant epidemics known in natural history.

Permits and licences issued under the Migratory Birds Convention Act, valid during the year 1939, were as follows:—

344 permits to collect specimens of migratory birds for scientific purposes.
206 permits for banding purposes.
102 permits allowing the destruction of certain birds when found injuring agricultural, fishery, or other interests.
564 permits to possess birds for propagating purposes.
11 permits to take birds for propagating purposes.
26 permits allowing the collecting of eider-down.
64 permits to destroy herring gulls.
62 permits to collect gulls' eggs in Saguenay County, P.Q.
5 permits to collect gulls' eggs on bird sanctuaries.
3 permits to possess and discharge firearms on bird sanctuaries for the purpose of frightening seals.
2 permits to transport unloaded firearms and artificial decoys across bird sanctuaries.
1 permit to erect and maintain a cabin on a bird sanctuary.
1 permit to possess and discharge firearms on a bird sanctuary in order to control starlings.
65 taxidermist's licences.

The following printed material was distributed during the year: Consolidation of the Migratory Birds Convention Act and Regulations, 6,700; Abstracts of the Act, 18,400; posters, 42,000; pamphlets, 26,800.

One hundred and fifteen lectures were given by officers of the Bureau and lecture material, including motion pictures and lantern slides, was lent freely to voluntary assistants.

Wild Life Protection

Investigation concerning fluctuations in the population of the snowshoe rabbit or varying hare in Canada was continued and the data obtained were forwarded for compilation to Mr. Charles Elton, Director, Bureau of Animal Population, Oxford University, Oxford, England.

Continued co-operation was given to the Northwest Territories Administration in problems relating to wild life.

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

The Fifty-seventh Stated Meeting of the American Ornithologists' Union, Berkeley and San Francisco, California, June 19-24, 1939.

American Fisheries Society, San Francisco, California, June 26-27, 1939.

The International Association of Game, Fish and Conservation Commissioners, San Francisco, California, June 29-30, 1939.

The Wild Life Conference of Game Officials of the Prairie Provinces, Winnipeg, Manitoba, November 2-3, 1939.

The 5th North American Wildlife Conference, Washington, D.C., March 18-20, 1940.

A draft Act for the control of interprovincial shipments of game and furs, now known as the Game Removal Act was placed before the provinces and practically complete concurrence has been reached.

Three officers of this Division are members of the Interdepartmental Committee on Phenology, the purpose of which is to consider the feasibility of collecting phenological data on a subject that is of interest to the many departments of government concerned with biological problems.

Two officers of this Division are members of the Interdepartmental Reindeer Committee. Four meetings of this Committee were attended during the year.

Advisory Board on Wild Life Protection

The Advisory Board on Wild Life Protection, an interdepartmental committee organized December 28, 1916, held four meetings as follows: May 15, June 27, and October 6, 1939, and March 8, 1940. A few of the subjects dealt with were assistance to the National Forestry Program Camps by recommending subjects and lectures on wild life conservation; proposals for national activity in wild life research; danger to the eastern slope of the Rockies from destruction of forests and consequent erosion if herbivores are not kept in control by their natural enemies; reservation of areas in the Northwest Territories as game sanctuaries; development of an eider-down industry in southern Baffin Island; changes in the Northwest Game Regulations; beaver reserves and seasons; conservation of caribou, Coronation Gulf region; predator control and payment of bounties; wild life conditions in Banff National Park, and scientific reports relating to the Arctic patrol, 1939, dealing with (*a*) wild life, (*b*) plankton, (*c*) molluscs, and (*d*) parasitology.

Dr. Harrison F. Lewis, Chief Federal Migratory Bird Officer for the Provinces of Ontario and Quebec, was appointed a member of the Board, the only change in personnel during the year.

APPENDIX

The Alpine Club of Canada

(From the report of the Chairman of the Club-House Committee)

The total number of members and guests registered at the Club-House during the season was 221, of which 47 were members. The season opened badly, the attendance during July being very poor, but during August the house was well filled, so that at the end of the season the net results were comparatively favourable.

The following provinces and countries were represented in registration:—

British Columbia	19	United States	75
Alberta	61	Scotland	6
Saskatchewan	5	England	21
Manitoba	7	Wales	1
Ontario	12	New Zealand	1
Quebec	10	Hawaii	1
France	2		

(General Report compiled from the Gazette of the Alpine Club)

The thirty-fourth annual camp was held from July 15 to 29, near the head of the Ice River Valley in Yoho National Park. Unfortunately the first two days were wet, which upset the transport arrangements. However, the weather cleared early in the week and continued fine for the rest of the time on the lesser peaks. Altogether 128 persons, including the staff, were placed under canvas, representatives attending from the Alpine Clubs of England, America, and France; the Royal Geographical Society, the Appalachian Mountain Club, B.C. Mountaineering Club, the Mazamas, the Sierra Club, and the Obsidians.

The high camp equipment was pitched on the Vaux snowfield at an elevation of about 9,000 feet, and was visited by about 40 people. During the second week a fly camp was established at about 7,500 feet above Zinc Gulch, from where parties climbed Goodsir and Zinc. Fifteen climbed the south tower of Goodsir, a very creditable achievement, as the peak was not free from fresh snow before the end of the second week.

Peaks climbed were: Ennis, Vaux, Hanbury, Garnet, Butwell, "G1", Zinc, Goodsir (South Tower) and "Marten's", the latter being a first ascent of an unnamed peak at the head of Marten's Creek, which proved to be a most interesting rock climb. The annual meeting of the club was held at the Goodsir's camp on July 23, 1939.

DOMINION FOREST SERVICE

The outbreak of war directed attention to the favourable position held by Canada's forest resources in relation to the war effort. Products of our forests enter into many phases of war-time preparation and production. The forests provide materials for aircraft, ship, and motor-vehicle construction; for hangar and camp buildings; for containers for munitions, as well as charcoal for gas masks and an increasing number of other derivatives essential for defence. The Dominion's war economy also benefits by the favourable balance of trade in forest products and by the exceptional tourist appeal of our forest-clad mountains and forest-bordered lakes and streams.

While the importance of our forests in the war effort is generally recognized, it is well to bear in mind that these valuable resources will be called upon to assist in the readjustment after the war. The most productive use to which over one-third of the land area of the Dominion can be put is the growing of forests and its full use will require forest management on a scale difficult to

realize. This management must not be based solely on production of raw materials for industry but rather on a multiple-use basis, having in mind the tourist business, wild life conservation, stream-flow protection and regulation, soil erosion, and the tempering of excessive climatic changes.

In the industrial phase, Canada's place in world markets must be strengthened and enlarged by improving the quality of her products and at the same time by making them available at a favourable competitive price. This can only be attained by constant research not only in the yield-capacity of our vast forests but in the economical and full utilization of the wood grown.

The Dominion Forest Service is a research and fact-finding organization charged with the task of conducting studies and investigations into the production of raw materials from the forests, and utilization thereof. Forest experiment stations and forest products laboratories are the media through which findings are tested and confirmed.

The year under review was notable for the inauguration of the National Forestry Program. Following the outbreak of war assistance was given to the war departments in matters relating to forest resources and products, including a review of the aircraft spruce situation in British Columbia and the preparation of a new grading rule, the designing and testing of munitions containers, the provision of specifications for lumber purchases, and the giving of technical advice on the suitability of Canadian woods for various war purposes. Officers of the Forest Service supervised the undertaking of forestry work projects in enemy aliens' internment camps established at two forest experiment stations.

National Forestry Program

During the spring of 1939 the Dominion Forest Service worked out the details and supervised the operation of the National Forestry Program. This program was made possible by the joint action of the Department of Labour and the Department of Mines and Resources. The purpose of the scheme was twofold: first, the mental and physical rehabilitation of young men between the ages of 18 and 25 years who were unable to find gainful employment, and, second, the provision of a measure of assistance in forest conservation throughout Canada by utilizing the services of these young men in the construction of fire-protection improvements, silvicultural operations, recreational development, and conservation of fish and game.

The National Forestry Program was divided into two sections, namely, Dominion and Provincial. Under the Dominion section, work was carried out at Dominion forest experiment stations and in national parks. This section was under the immediate direction of the Dominion Forest Service and accounted for the employment of 1,000 enrolees.

The costs under the Dominion section were borne totally by the Federal Government. In the Provincial section the work was carried out on provincial forests, the costs being borne equally by the Provincial and Dominion Governments. The immediate direction of work on provincial areas was a function of the provincial authorities, but the Dominion Forest Service was charged with the approval of plans for such work, as well as with inspections. Some 4,000 enrolees were employed with the provincial services.

The program called for work, recreation, and training for a period not exceeding five months. The rate of pay was $1 per day, with board, lodging, and medical services. Enrolees under the scheme, after their applications were approved for circumstances and character, were required to pass a medical examination before being taken on strength.

The undertaking was a complete success. It resulted not only in a vast improvement in the physical condition and morale of these young men, thus better fitting them to seek employment, but also resulted in the accomplishment of much useful work in forest conservation.

FOREST ECONOMICS

The Division of Forest Economics compiles and analyses statistics of forest resources, rates at which products of the forest are being used and destroyed, the progress of industries using wood as their chief raw material, and the trends of domestic and foreign trade in wood and its derivatives. It is customary to present each year some of the more important statistics relating to Canada's forests and forest industries during the latest years of record. These are as follows:—

Average Annual Depletion, 1929-38

	Millions of cubic feet
Volume utilized	2,546
Merchantable timber burned	391
Young growth burned	349
Destroyed by insects, fungi, etc.	700
	3,986

Total depletion, including utilization and waste, amounted to 2·3 per cent of the estimated volume of accessible merchantable timber.

GROWTH

It has been estimated that the annual depletion can be replaced by an average annual growth of only 8 cubic feet per acre. But actual utilization is confined to accessible areas, rather than spread over the whole forest, and a large part of the loss from fire and pests also occurs on the accessible lands. Consequently, growth on the whole forest may easily balance total depletion, although, at the same time, depletion may be far too heavy on the accessible lands.

FOREST INDUSTRIES

Summary of Statistics of the Forest Industries, 1938

—	Number of Employees	Salaries and Wages	Net Value of Products
		$	$
Woods operations	93,000	74,000,000	148,265,857
Lumber industry	31,182	25,345,064	39,264,528
Pulp and paper industry	30,943	42,619,311	89,034,186
Wood-using industries	30,601	26,984,592	39,747,208
Paper-using industries*	11,661	13,234,150	25,402,119
Total	197,387	182,183,117	341,713,898

* Exclusive of books and printed matter. The figure given for men employed in woods operations is an equivalent calculated on a man-year basis.

THE LUMBER INDUSTRY

The lumber industry was somewhat less active in 1938 than in the preceding year. Production of sawn lumber fell from 4,005,601 M ft. b.m. in 1937 to 3,768,351 M ft. b.m. in 1938, and the value of all sawmill products was reduced from $104,849,785 to $92,855,906, a decrease of 11·4 per cent.

THE PULP AND PAPER INDUSTRY

Production of the pulp and paper industry was also lower in 1938 than in 1937. Total production of wood-pulp fell from 5,141,504 tons to 3,667,789 tons, and that of paper was reduced from 4,345,361 tons to 3,249,358 tons. Gross value of all products of the pulp and paper industry decreased from $226,244,711 in 1937 to $183,897,503 in 1938, a drop of 18·7 per cent.

Production of pulpwood in Canada totalled 6,306,747 cords, valued at $53,761,999, in 1938, as compared with the record cut of 8,298,165 cords, valued at $63,057,205, in 1937.

TRADE IN FOREST PRODUCTS

The favourable balance obtained from external trade in wood and the products derived from wood amounted to $222,871,620 in 1939.

Exports of Wood, Wood Products, and Paper

(Exclusive of books and printed matter)

	Calendar Years	
	1938	1939
	$	$
Raw materials (logs, bolts, pulpwood)	17,734,535	18,221,853
Products prepared in woods (poles, hewn ties, etc.)	2,055,620	2,593,149
Sawmill and planing-mill products (lumber, shingles, etc.)	47,380,549	63,105,771
Manufactured wood products (doors, furniture, etc.)	2,889,062	2,374,043
Pulp, paper, and manufactures thereof	140,603,514	155,127,766
Total	210,663,280	241,422,582

The proportion of the total value of Canadian exports of products of the forest and forest industries sold to countries of the British Empire was slightly lower in 1939 than in the previous year. The United States continued to be our best customer for these products, accepting approximately two-thirds of the total value.

Per Cent of Value of Exports of Forest Products to the Principal Importing Countries

	Calendar Years	
	1938	1939
United Kingdom	18·2	18·1
Other British countries	9·5	8·4
United States	66·4	68·4
Other foreign countries	5·9	5·1
	100·0	100·0

AERIAL FOREST SURVEYS

The duoscope, an instrument developed by the Forest Service to permit of the transfer of details from photograph to map sheet in a single operation, has proved an effective means for obtaining quick results and reducing costs.

During the year a binocular attachment was designed and added to the former model with successful results. A photo-electric planimeter was originated and brought to a workable stage of development. This instrument makes possible the measurement of mapped areas, at a speed hitherto unattainable, through the use of a simple principle. A wedge scale was developed for making fine measurements on aerial photographs, and an alignment chart was devised to facilitate calculations of tree heights from images so measured.

Observations were made in the field as an aid to the preparation of volumetric estimates and to assist in the identification of species and forest types. A new formula devised by the Forest Service for estimating diameters of trees from aerial photographs was checked by ground measurements.

Forests were mapped for forest-inventory purposes on 930 square miles in Nova Scotia, where interest in timber supplies has been quickened by war developments. On the Petawawa Forest Experiment Station 60 square miles were mapped in great detail, including the delimitation of forest-site classifications developed in the field. Maps of an area of 53 square miles in New Brunswick were made in co-operation with a pulp and paper company as a test of the value of aerial photographs for operating purposes. Thirty-eight square miles in Ontario were mapped to test the accuracy of volumetric estimates. At the request of the Indian Affairs Branch of this Department, 100 square miles were mapped to ascertain the supplies of fuel-wood available near Oka, Quebec. Ten square miles were mapped in the Gatineau district near Ottawa for the Federal District Commission.

SILVICULTURAL RESEARCH

It is the policy of the Dominion Forest Service to determine through research, and to apply on demonstration areas, measures necessary for the handling of forest lands under forestry principles. Methods thus determined are made available to administrative and utilization organizations. To this end five forest research experiment stations have been established, each station representing a different major forest region. Methods of improving production of second-growth stands are of primary interest. Study of practical methods of managing mature stands to ensure ample and continuous future supplies constitutes the second field of research. These two fields involve basic work in biology, ecology, and mensuration. Studies of timber types and age-classes not represented on any of the five forest experiment stations are conducted on outside areas in co-operation with provincial services and the industries.

A Classification for Forest Research Projects has been developed this year, and has been published as Research Note No. 61. It provides that every silvicultural research project shall be allocated to one of ten major divisions, namely, Botany, Ecology, Silviculture, Mensuration, Forest Influences, Protection, Administration, Economics, Technology, and Utilization.

At a conference of interested scientists in the Department of Mines and Resources, the Department of Agriculture, and the National Research Council, the problem of extending and co-ordinating phenological data was discussed at length. A working committee was appointed to study standardization of forms, determination of index phenomena, selection of key stations, and means of assembling and analysing data. Satisfactory progress is being made. In the meantime phenological data are being taken at each experiment station.

The program of forest tree breeding, started two years ago in co-operation with the Tree Breeding Sub-committee of the Associate Committee on Forestry, under the National Research Council, has made marked progress. It includes projects in selection and testing of superior natural species types for hybridization or direct utilization; production of new forms through hybridization or induced

chromosome doubling, and testing of new forms for quality, adaptation, growth-rate, and disease resistance. Substantial progress has been made in developing spruce by cross-pollination and by propagation from cuttings. Efforts are being made to develop, by cross-pollination with Asiatic species, strains of white pine resistant to blister-rust.

About 10,000 hybrid poplars have been produced in a search for rapid-growing, rot-resistant species of high quality for match-stock and for pulpwood. Species with qualities suitable for use in prairie shelter-belts are also being sought. Work is also proceeding to determine the effect of different soil media on rooting. Various admixtures of fine sand, coarse sand, loam, clay, peat, moss, peat humus, and sawdust are being tried. Some conclusive results have been obtained.

The irregularity and uncertainty of white pine reproduction following cutting and fire is disturbing. This succession of white pine is another project being conducted in co-operation with the Associate Committee on Forestry of the National Research Council. Investigations were conducted in the Ottawa Valley region.

In a search for species of high quality, many exotic species, principally pines and spruces, are being raised from seed in the nurseries at the Petawawa, Acadia, and Kananaskis stations. Several Asiatic white pines and some Douglas firs from British Columbia grown at Petawawa are very promising. A seed-dissemination study was undertaken at Petawawa to determine the distance to which pine and spruce seed will be carried by the wind. A series of plots was established at each station to study the relative value of exposing mineral soil by mechanical means and by burning to induce reproduction of pine and spruce; this project should throw valuable light on the problem of reproduction following cutting.

Marked progress has been made in nursery and planting technique. It has been found that, at Petawawa, autumn is the better season for sowing pine, though spring is more favourable for spruce. Basswood seed requires from two to four years to germinate. To overcome poor drainage, seed-beds should be raised above ground-level. Sawdust mixed in heavy soils improves the seed-bed for spruce and pine.

White pine cannot be grown successfully in pure stands because of white pine weevil attacks. In an endeavour to overcome this difficulty, 35 acres of poplar stands at Petawawa were heavily thinned and under-planted with white pine. The Entomological Division, Science Service, Department of Agriculture, is giving co-operation. A similar project is under way at the Acadia station in the wire birch type. Ten thousand red and white pine seedlings were planted, experimentally, to reclaim sand plains at Valcartier station.

Over 300 acres of 35-year-old jack pine stands near the Petawawa Military Camp were heavily thinned by relief labour. Over 900 cords of the thinnings were utilized for fuel. The purposes were protection, improvement of growth, and aesthetic improvement. Permanent records were taken for two improvement-cutting experiments of about 35 acres each in a mixedwood stand 50 to 60 years old, at Petawawa. Much of the material removed was sold as logs or fuelwood. The net cost of improvement was $3.16 and $3.33 per acre, respectively.

A more practical operation on a larger scale was conducted in the winter of 1939-40, the final phase continuing this season. From a somewhat older stand the large poplar was removed for match stock. A second operation is now removing the smaller poplar and tops left from match-stock operations, as peeled pulpwood. The dual operation provides a net return of $5 to $10 per acre, and has left a stand of pine and spruce advance-growth sufficient for complete stocking. Similar thinning, improvement cutting, and harvest cutting operations were con-

ducted at the Acadia station in accordance with the working plans and for investigative purposes. In Riding Mountain National Park, 2,500,000 feet board measure of spruce and jack pine was marked and cut as provided by the working-plan budget. Poplar fuel-wood operations were conducted on a silvicultural basis to provide a new crop of sound timber. A series of sample plots was established in stands of stagnated lodgepole pine and Douglas fir at Kananaskis to study the effect of thinning as a means of stimulating growth and improving quality.

The survey of balsam fir on cut-over lands of the Upper Gatineau watershed to determine the most important factors influencing balsam fir buttrot, started last year, was concluded. A relationship between site-type and butt-rot has been found. This project was conducted co-operatively by the Dominion Forest Service, the Science Service of the Department of Agriculture, and the Canadian International Paper Company.

The Entomological Division of the Science Service of the Department of Agriculture is prosecuting investigations of white pine weevil, tent caterpillar, red pine saw-fly, and larch saw-fly from the laboratory at the Petawawa station. Similarly, the plant-pathological unit of the Division of Botany is devoting attention to decay in poplar, beech canker, and the inherent resistance of tree species to disease.

The following Research Notes were issued: 57, Thinning and Pruning of Red Pine Plantation at Rockland; 58, General Outline for Reproduction Studies; 59, Some Simple Management Methods Applied to Farmers' Woodlots; 60, Some Observations on a Visit to New England; 61, Classification for Forest Research Projects.

FOREST PROTECTION

The Dominion Forest Service carries on research work in forest-fire protection at its forest experiment stations and also at other points, in co-operation with forest industries, provincial governments, and the National Research Council. Studies deal with the improvement of methods, equipment, and technique for detecting and suppressing forest fires, and increasing efficiency of fire-protective effort. The annual statistics of forest-fire losses in Canada are compiled from information collected from provincial and other forest-protective organizations.

The year 1939 was, on the whole, a favourable one from the point of view of forest-fire protection. Though Alberta experienced its fourth consecutive bad fire year, the losses in all other provinces were considerably below normal. The total number of fires reported in Canada was 5,613, compared with an average of 6,139 for the period 1930-39. Eighty-six per cent of these fires were attributed to human agencies, and the remaining 14 per cent to lightning. The total loss and damage, including cost of fire-fighting, was $2,729,321, compared with an average of $4,961,405 for the ten-year period 1930-39. Detailed statistics of forest-fire losses and causes for Canada as a whole in each of the ten years 1930-39, will be found in Tables 1 and 2 (pp. 123 and 124). Table 3 (p. 125) gives the corresponding figures by provinces as to the number of fires, the proportion due to lightning, the areas burned, and the fire losses.

A short description, by provinces, of the fire season follows:—

British Columbia.—The year was a favourable one, the loss and damage from forest fires being much below the average for the past ten years. During the early spring the rainfall was less than normal, but this was followed by a wet May and June. In July the rainfall on Vancouver Island and in the northern portion of the province was twice the normal, but dry conditions prevailed in the interior. August and September were generally dry, except in the north, which, throughout the season, experienced more rainfall than usual.

and saplings from scattered seed-trees. The situation seems to call for the development of a system of co-operation between interests, governmental and private, involved in saving the white pine as a commercial asset. This procedure has proved most satisfactory for the control of this disease in the United States.

By reason of the peculiar habitat of western white pine *(Pinus monticola)* its protection against the rust seems scarcely feasible, but the eastern species *(Pinus Strobus)* is easily accessible, and the eradication from its vicinity of all species of Ribes, which constitute the secondary host for this fungus disease, would ensure the safety of the species. The great value of the tree, the stand of which is estimated to have a volume of 8,000,000,000 feet board measure of saw-timber and 10,000,000 cords of smaller material, is self-evident. Experimental work at the Petawawa forest experiment station, where the better stands have been given primary treatment, shows the cost to average 20 cents per acre.

Dominion Protected Lands.—Fire protection on National Parks, Indian reserves, and Dominion forest experiment stations is administered by the Dominion Government. 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 (p. 125).

Forest-fire Research

The use of the system for measuring and forecasting forest-fire hazard that has been developed at the Petawawa Forest Experiment Station for the guidance of forest officers in the administration of fire-protection was further extended during the year. Twenty-eight weather stations for the use of this system have been established by the New Brunswick Forest Service under the technical direction of Dominion officers; these cover the forested areas in that province. The forested areas in Quebec are now covered by a network of 107 weather stations using the system, under the supervision of provincial officers. During the year the system was extended to the Riding Mountain National Park in Manitoba and Prince Albert National Park in Saskatchewan. Four weather stations were established in each park, under the direction of the Forest Service.

A preliminary inspection was made of fire-types in Banff, Jasper, and Waterton Lakes National Parks, and tentative sites were selected for weather stations for the operation of the system of fire-hazard measurement. As the forest and climatic conditions in these areas differ greatly from those in the East, where the system was developed, it was necessary to establish a fire-hazard research station at the Kananaskis Forest Experiment Station in Alberta to adapt the system for use in this region.

Basic research in forest-fire hazard was carried on by the Forest Service in New Brunswick, at the Petawawa (Ontario) and Kananaskis (Alberta) Forest Experiment Stations, and at Riding Mountain National Park (Manitoba).

As a result of studies at Petawawa and the National Research Laboratories and of co-operation by manufacturers, a new light-weight, self-priming centrifugal power-pump has been produced for forest-fire fighting. Another result of co-operation by manufacturers has been the development of a light portable one-man hose-reel for picking up wet hose on rough ground after a fire. It is expected that this reel will prolong the life of forestry hose, which up to the present has been subject to heavy depreciation from wear and tear in use.

Studies were continued at the Petawawa Forest Experiment Station in the use of chemicals in forest-fire protection.

Mimeographed publications were issued on forecasting weather and forest fire-hazard from local observations, fire-hazard tables with supplements, and the practical value of fire-hazard records and forecasts.

White-Pine Blister Rust

A reconnaissance of a sample area of 2,000 square miles of white pine territory bordering the Upper Ottawa between Fort Coulonge and Mattawa showed 10 to 20 per cent of the white pine affected in areas contiguous to settlement, but only 1 to 2 per cent on Crown land areas. This seems to be owing to the presence in the settled areas of the domestic black currant, which is by far the worst spreader of the disease of any of the species of Ribes. The survey shows, further, that if the moist, low-lying third of the pine lands (wherein the Ribes are largely concentrated) is given rust-protection, the problem may be satisfactorily solved. Incidentally, the survey shows that the white pine (mature stands of which now occupy only 2 per cent of the original forested area) is capable of reproducing itself as is shown by the presence of white pine seedlings

and saplings from scattered seed-trees. The situation seems to call for the development of a system of co-operation between interests, governmental and private, involved in saving the white pine as a commercial asset. This procedure has proved most satisfactory for the control of this disease in the United States.

By reason of the peculiar habitat of western white pine *(Pinus monticola)* its protection against the rust seems scarcely feasible, but the eastern species *(Pinus Strobus)* is easily accessible, and the eradication from its vicinity of all species of Ribes, which constitute the secondary host for this fungus disease, would ensure the safety of the species. The great value of the tree, the stand of which is estimated to have a volume of 8,000,000,000 feet board measure of saw-timber and 10,000,000 cords of smaller material, is self-evident. Experimental work at the Petawawa forest experiment station, where the better stands have been given primary treatment, shows the cost to average 20 cents per acre.

TABLE 1

Statement of Forest Fires in Canada by Years for the 10-year Period 1930-39, with the Average for the Period

Item	Year										Total	Average
	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939		
Fires under 10 acres	.....	.....	.....	.....	.....	.....	4,031	3,886	4,476	3,990	.....	.....
Fires 10 acres and over	.....	.....	.....	.....	.....	.....	1,915	2,063	2,171	1,623	.....	.....
Total number of fires	6,805	6,965	6,298	6,298	5,911	4,955	5,946	5,949	6,647	5,613	61,387	6,139
Total area burned....acres	2,670,188	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	22,106,915	2,210,691
Merchantable timber—												
Area burned.....acres	746,129	394,824	708,085	204,405	321,414	172,592	919,764	662,792	722,199	199,288	5,051,492	505,149
Timber burned.....M ft. b.m.	779,081	538,551	569,126	255,383	899,545	98,971	2,077,584	408,942	2,160,192	196,803	7,984,178	798,418
Timber burned.....cords	2,043,142	1,241,647	2,705,374	650,318	836,554	785,552	3,524,493	4,354,820	2,557,780	911,051	19,610,731	1,961,073
Estimated stumpage value. $	4,452,046	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	25,545,845	2,554,584
Young growth—												
Area burned.....acres	577,980	590,234	586,141	220,620	242,101	191,940	739,701	2,035,830	719,461	326,358	6,230,366	623,037
Estimated value..... $	1,456,135	1,215,682	1,209,063	454,648	573,455	326,423	1,284,102	1,161,861	1,286,512	448,924	9,416,805	941,680
Cut-over land—												
Area burned.....acres	427,285	535,418	772,625	331,614	562,446	258,964	303,348	188,385	548,792	266,542	4,195,419	419,542
Estimated value..... $	275,578	219,776	615,605	187,303	246,031	262,725	66,253	155,276	328,737	767,787	3,125,071	312,507
Non-forested area burned...acres	918,794	573,442	397,069	251,918	349,156	232,687	1,063,833	1,384,424	1,135,316	322,991	6,629,630	662,963
Other property burned, value $	506,779	363,516	264,769	162,075	149,923	355,541	84,560	151,809	827,804	283,798	3,150,574	315,057
Total damage..... $	6,690,538	3,514,087	7,153,014	2,003,331	2,724,292	2,199,670	6,081,641	3,550,964	5,220,935	2,099,824	41,238,296	4,123,830
Actual cost of fire-fighting.... $	1,135,909	931,504	683,650	509,939	827,451	526,743	1,206,863	878,563	1,045,637	629,497	8,375,756	837,576
Total damage and costs.. $	7,826,447	4,445,591	7,836,664	2,513,270	3,551,743	2,726,413	7,288,504	4,429,527	6,266,572	2,729,321	49,614,052	4,961,405

TABLE 2

Statement of Forest Fires in Canada by Causes for the 10-Year Period 1930-39

Cause	Year																				Total No. Fires	Average 1930-39	
	1930		1931		1932		1933		1934		1935		1936		1937		1938		1939			No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Camp-fires	1,265	18	1,481	21	1,329	21	1,202	19	1,111	19	875	18	1,185	20	1,235	22	1,390	21	1,108	20	12,181	1,218	20
Smokers	790	12	998	14	809	13	893	14	971	17	985	20	947	16	860	14	980	15	1,004	19	9,237	924	15
Settlers	954	14	1,097	16	1,385	22	1,265	20	946	16	1,143	23	567	9	973	16	1,154	17	845	15	10,329	1,033	17
Railways	731	11	625	9	354	6	312	5	255	4	192	4	176	3	232	4	176	3	185	3	3,238	324	5
Lightning	1,483	22	880	13	651	10	940	15	957	16	331	7	1,529	26	832	14	1,046	16	796	14	9,445	944	15
Industrial operations	137	2	133	2	91	1	94	1	198	3	123	2	132	2	190	3	176	3	112	2	1,386	139	2
Incendiary	522	8	674	10	746	12	511	8	349	6	400	8	608	10	383	6	558	8	465	8	5,216	522	9
Public works	98	1	97	1	47	1	56	1	104	2	35	1	42	1	88	1	57	1	75	1	699	70	1
Miscellaneous known	266	4	368	5	243	4	300	5	365	6	324	6	288	5	528	9	488	7	590	10	3,760	376	6
Unknown	559	8	612	9	643	10	725	12	655	11	547	11	472	8	628	11	622	9	433	8	5,896	590	10
Totals	6,805	100	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	61,387	6,139	100

TABLE 3

Statistics of Fires by Provinces, 1939

Averages given are those for the 10-year period, 1930–39

Item	British Columbia		Alberta		Saskatchewan		Manitoba		Ontario	
	1939	Average	1939	Average	1939	Average	1939	Average	1939	Average
Fires—										
Total number	1,704	1,714	499	354	194	238	501	379	961	1,609
Caused by lightning %	29	27	4	4	3	7	3	13	19	20
Area burned (acres)—										
Merchantable	12,210	73,682	99,744	110,139	50,237	49,395	14,943	33,572	4,382	182,686
Young growth	33,935	90,571	128,768	135,322	108,364	220,578	27,958	36,297	5,742	83,389
Cut-over	135,150	236,828	40,853	17,034	17,897	11,835	6,803	3,445	11,450	24,611
Non-forested	12,173	43,016	159,774	157,948	39,286	135,075	81,628	153,562	7,524	107,807
Total	193,468	444,098	429,139	420,443	215,784	416,883	131,332	226,877	29,098	398,494
Damage $	372,724	1,039,536	1,249,879	746,352	47,564	221,111	96,012	121,282	78,597	1,314,649
Cost of fire-fighting $	233,324	200,320	140,653	69,317	6,886	59,620	37,633	30,640	74,062	292,995
Total damage and costs $	606,048	1,239,855	1,390,532	815,669	54,450	280,731	133,645	151,922	152,659	1,607,644

Item	Quebec		New Brunswick		Nova Scotia		Dominion Lands					
							National Parks		Indian Lands		F. Expt. Stations	
	1939	Average	1939	Average	1939	Average	1939	Average	1939	Average	1939	Average*
Fires—												
Total number	856	1,060	256	269	442	386	120	79	71	45	9	6
Caused by lightning %	3	5	8	13	0	0	4	9	18	15	0	17
Area burned (acres)—												
Merchantable	9,068	40,968	1,344	7,577	781	1,558	6,409	2,876	170	2,292	0	449
Young growth	15,119	36,352	3,958	7,010	1,926	6,021	329	5,262	257	1,457	2	864
Cut-over	49,761	112,268	1,079	10,516	722	1,485	2,753	872	74	615	0	35
Non-forested	6,353	19,894	6,324	24,754	5,406	12,577	3,562	6,161	959	1,539	2	719
Total	80,301	209,483	12,705	49,857	8,835	21,641	13,053	15,172	1,460	5,903	4	2,067
Damage $	202,758	519,221	21,183	82,869	6,336	27,386	22,992	34,900	1,772	10,984	7	6,154
Cost of fire-fighting $	82,768	114,947	11,727	27,256	23,238	25,918	14,878	12,032	4,320	4,084	8	574
Total damage and costs $	285,526	634,168	32,910	110,126	29,574	53,304	37,870	46,932	6,092	15,068	15	6,728

* Exclusive of 1933.

FOREST PRODUCTS LABORATORIES

The work of the Forest Products Laboratories pertains principally to scientific and technical problems arising in the manufacturing and marketing of products derived by mechanical and chemical processes from Canadian woods. Of special importance is improvement in existing practices and the curtailment of the waste that occurs in logging and manufacturing. An essential function of the Laboratories is collaboration with similar organizations in other countries.

The main laboratories are located in Ottawa. A branch laboratory is operated in Vancouver in association with the University of British Columbia. A pulp and paper laboratory is maintained in Montreal and is operated in collaboration with the Canadian Pulp and Paper Association and McGill University.

Following are brief references to some of the problems which have received attention during the year.

Main Laboratories (Ottawa)

DIVISION OF WOOD PRESERVATION

Timber for use in repairs to ships of the Canadian navy was impregnated with fire-retardant chemicals and kiln-dried. The war also stimulated a demand for fire-retardant paints for wooden buildings. Tests were made for the Department of National Defence to determine the most effective fire-retardant paints at present on the market.

Cedar pole stubs treated by seven different processes, together with untreated controls, were installed in the test plot at the Experimental Farm, Ottawa. The problem to be solved is how best to arrest decay in the butts of some of the 10,000,000 untreated poles at present in use in Canada.

Twenty-five charges of red pine poles were treated in an experimental cylinder in the laboratory in order to determine (1) the degree of air-seasoning required before treatment, and (2) the best method of curtailing "bleeding" of the creosote after treatment.

Zinc chloride, chromated zinc chloride, zinc silico-fluoride, and lead silico-fluoride have been examined by similar methods to determine their toxicity and resistance to leaching. The tests on zinc chloride, the preservative properties of which are well known, served as controls.

Definite information on service life is required in order to estimate when and where treated timber can be used to advantage. With the co-operation of engineers in Government departments and commercial companies, 639 groups of timbers have been selected, and the life obtained carefully recorded from year to year. The timbers under observation include railway ties, telephone poles, piling, caps, stringers, and wharf decking located between Halifax and Vancouver.

At the request of the Department of Public Works, toxicity tests were made on timber treated in France by a creosote vapour process. It is claimed that the creosote vapour penetrates the wood and so protects the timber from decay and that this process requires much less creosote than is used in the standard pressure processes.

It is customary to estimate the average service life of creosoted poles as from 35 to 40 years. Individual poles in England have been reported as still sound after 63 years' service. When it was reported that some creosoted poles in Western Canada were failing after 10 years' service, this unusual result was investigated. It was found that the failure can be attributed to incomplete sapwood penetration and the use of an oil less toxic to wood-destroying fungi than standard coal-tar creosote.

White pine and maple planks, 3 inches by 9 inches by 5 feet, steeped in brine for from 3 to 4 days in connection with studies on the chemical seasoning of timber, were examined to determine the distribution of sodium chloride before and after seasoning. It was found that seasoning caused little or no change in the distribution of the salt, most of which was concentrated in the outer quarter-inch of the cross-sections. This information is of value in connection with consumer objections to the presence of salt in chemically seasoned timber.

For many years freight charges have greatly affected the cost of creosote used in treating plants in the Prairie Provinces. Therefore, the development of local plants producing a medium-temperature tar and a light type of creosote from lignite coal was watched with interest. Although timber could be treated with either the medium tar or the lignite distillate, neither of these products would pass the standard specifications for creosote in use by the railways and other consumers of treated timber. However, by mixing about 80 parts of the tar with 20 parts of the creosote, a very satisfactory treating mixture can be obtained; and, by blending 25 parts of the lignite distillate with 25 parts of standard creosote and 50 parts of crude oil, an economical treating mixture can be obtained. Blending the tar and crude oil is not possible owing to the formation of sludge.

DIVISION OF TIMBER MECHANICS

Experiments were carried out to check certain methods of conducting tests used in Canada with different methods which have been recommended in Europe. It was found that the two methods gave closely similar results.

Tests on Eastern cedar poles supplied by one of the large power companies showed almost negligible deterioration in ageing of the upper portion of the pole. The tests yielded valuable data covering the decay at or near the ground-line and the effect of the practice of periodically shaving off decayed material in this vicinity.

In co-operation with a Committee on Logging Sleighs of the Woodlands Section of the Canadian Pulp and Paper Association, the Laboratories prepared a new design of single-horse sleigh, and a large number of sleighs were built by pulp and paper companies according to the approved design.

Work was carried out on glues and gluing methods applicable to the use of plywood in the construction of aircraft. Special attention was given to the effect of high moistures and high temperatures on glue bonds.

On request, a new design of cheese box was prepared for the Department of Agriculture for export shipments.

In co-operation with the American Society for Testing Materials, an investigation was carried out with respect to standards for testing corrugated-board containers.

At the request of the National Building Code Committee and the National Housing Administration, a series of tests was made to determine the relative rigidity of frame walls covered with various kinds of sheathing, such as shiplap, fibre-boards (domestic and imported), plywood, and other materials.

The introduction of the ring-connector in timber construction has revolutionized design of many heavy timber structures and enabled timber to enter a wider field of construction. Tests of the added strength of joints assembled with ring-connectors were completed in order to supply designing engineers with more specific data than have heretofore been available regarding the fabrication of Canadian structural species with ring-connectors.

A representative of the laboratory attended an international conference on standardization of methods of timber testing in England.

Since the outbreak of war, a large part of the work of the division has pertained to design, testing, and specifications in connection with special war structures, aircraft, shipping containers, and other such matters.

DIVISION OF LUMBER SEASONING

Further study was made of the kiln-drying of white pine, fairly conclusive results being obtained with respect to the drying of stock under 2 inches in thickness. Special attention was paid to avoidance of brown stain in drying green and partly air-seasoned stock. Progress was made in drying 3-inch deals, but further study is required.

Work was completed on the drying for the Department of National Defence of 3-inch and 4-inch oak squares for artillery wheels.

A special study was made of the kiln-drying of 6-inch by 6-inch by 33-inch hard maple billets and of the drying of teak treated with a fire-retardant.

Surface and end-checks in air-seasoning have been responsible for as much as 70 per cent degrade in the shipment of white pine deal overseas. This material is costly, and losses incurred because of this degrade are heavy. After a survey of two yards, a change in the method of piling was recommended and adopted.

An experiment in a hardwood lumber yard with a grooved crosser designed in the Laboratory showed satisfactory results in preventing serious losses from the development of crosser-stain in sap maple of high value for specialty purposes.

Tests of white pine of 3-inch thickness treated with sodium chloride and allowed to air-season for one year, showed that the salt undoubtedly had a good effect in preventing checks, but that the lumber did not dry any faster than untreated material. Shrinkage of the wood was unaffected. While seasoning, most of the salt was carried to the surface, an advantageous point in that the wood after dressing would contain very little of the chemical. This verified previous findings in maple which had been kiln-dried after salt treatment.

A natural-circulation kiln of inexpensive construction was designed for emergency use where it is found expedient to kiln-dry stock rather than to follow the customary practice of air-seasoning.

DIVISION OF WOOD CHEMISTRY

A study was continued with respect to the resin and carbohydrate content of pine lumber from logs which have been handled in various ways prior to sawing and with lumber which has been subjected to different methods of seasoning. The purpose in view is to find the underlying cause for the variation that occurs in the susceptibility of such lumber to blue-stain and to resin exudation which interferes with satisfactory finishing.

A review was made of developments which have taken place throughout the world in the use of producer-gas from wood or charcoal in internal-combustion engines as a substitute for gasoline or diesel oil, and a report was prepared. Contact has been established with other investigators in this field.

Fish-floats of eastern cedar and western red cedar used at depths of 90 fathoms were found to fail frequently through absorption of water or collapse on account of the great pressure sustained. A treatment was developed in the Laboratories which greatly improves the service of such floats.

During the latter part of the year attention was given to a number of special matters including the following: (*a*) the manufacture and export of charcoal for special purposes (*b*) potash from wood ashes (*c*) the production of pine tar from Canadian woods, and (*d*) the activation of charcoal.

DIVISION OF TIMBER PHYSICS

A study was made of spruce and balsam fir from an area where conditions of growth resulted in timber of unusually high density. It was found that such material contained a large amount of compression-wood, a defect which appreciably depreciates the value of the material for lumber or pulp.

A study of the variation in density of spruce and balsam fir from the principal spruce districts of Eastern Canada which was carried out in co-operation with a number of pulp companies was finished and a report prepared for publication. The information is being used widely by pulp companies in evaluating pulpwood and in estimating annual wood requirements.

The study of resin exudation in white and red pine was continued; it included experiments to eliminate or curtail trouble on this account on painted surfaces.

A study of the effect of using linseed oil and lubricating oil in wood for concrete forms to prevent shrinkage showed little if any merit in such practice. The use of seasoned lumber was recommended.

Co-operation was extended to the National Research Council in their study of the relative qualities of native and hybrid poplars.

DIVISION OF WOOD UTILIZATION

A study was made in eleven representative spruce mills of Eastern Canada to determine the amount of material destroyed at present in refuse burners that might profitably be used in the manufacture of chemical pulp. It was found that about 520 cords of sound spruce are wasted for each million feet, board measure, of lumber produced. In 1937 this waste in Eastern Canada had a potential value of about $3,000,000. Steps were taken to improve this situation by promoting closer co-operation between the sawmill and pulp industries.

Studies were also made at the sawmills mentioned for the purpose of determining the relative costs of converting logs of different sizes into lumber, and thus ascertaining the minimum size of log which can economically be handled at a sawmill of a given type. This was done as a preliminary step in a broader study aimed at promoting the more rational selection of raw materials for the various wood-using industries so that ultimately each may obtain that class of material which is best suited to its needs.

Experiments in the use of sawdust as a domestic fuel, commenced during the previous year in co-operation with the Fuel Research Laboratories, Bureau of Mines, were completed. The results show that sawdust from pine, spruce, sugar maple, or yellow birch makes a satisfactory fuel even when in the "green" condition, provided that suitable grates are used. When the proper type of sawdust burner is attached to a furnace, sawdust can be burned with an efficiency equal to that obtained from the same furnace burning cordwood of the same species.

Experiments carried out in co-operation with the Division of Dairy Research, Science Service, Dominion Department of Agriculture, to test the suitability of certain West Coast woods for butter boxes were completed. The tests showed that Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), grand fir (*Abies grandis*) and amabilis fir (*Abies amabilis*) were all satisfactory woods for this purpose and none imparted any appreciable flavour to butter, especially when metal-foil butter-wraps were used.

DIVISION OF TIMBER PATHOLOGY

A brown cubical rot of standing balsam fir has been definitely associated with *Coniophora cerebella*. This fungus has also been isolated from untreated jack pine railway ties.

The fungus *Trametes serialis* (as described by Cartwright in 1930) has been identified as a cause of purple discoloration in Douglas fir; it was also isolated from Douglas fir from a building, and from untreated jack pine railway ties.

Work was continued on the study of red-stain in jack pine and its development in creosoted and untreated railway ties under service conditions.

A study was made of spore distribution in two lumber yards. It was found that from 12,000 to 1,000,000 spores fell on one square foot of lumber per day. Moisture and yard sanitation were found to be important factors. Fifteen per cent of the fungi belonged to the class which includes wood-destroyers.

Specific inquiries were dealt with during the year with reference to the nature and control of sapwood stain; the pulping value of decayed wood; the protection of pulpwood in storage; decay in pulpwood, poles, and building timbers; discolorations in oak, jack pine, Douglas fir, birch, and maple, and mould and decay in wooden food-containers.

COMMITTEE WORK

Members of the staff of the Laboratories served on the following committees:—

The Canadian Engineering Standards Association.—Committees on Structural Timbers, Wood Poles, Wood Piling, and Fire Tests for Structural Material.

The National Building Code Committee.—Sub-committees on Wood Construction and Fire Protection, Administrative and Advisory Committees.

The Canadian Electrical Association.—Committee on Overhead Systems.

The American Wood Preservers Association.—Committee on Painting of Creosoted Wood.

The Canadian Government Purchasing Standards Committee.—Sub-committees on Paint and Pigment Specifications, Paper Quality and Specifications for Chemicals.

The Canadian Pulp and Paper Association.—The Committee on Logging Sleighs, the Joint Committee of the Woodlands and Technical Sections, The Joint Administrative Committee of the Pulp and Paper Institute, and The Subcommittee on Culls.

The American Society for Testing Materials.—Committees on Shipping Containers, Timber, and Paper and Paper Products (Fibre Containers).

PUBLICATIONS

The following special publications were issued from the Ottawa Laboratories:—

Wood Taint in Butter Boxes. (Mimeographed.) (In co-operation with Department of Agriculture.)

Some Economic Aspects of the Use of Spruce Sawmill Waste for Chemical Pulp in Quebec and the Maritime Provinces.

The Kiln-drying of White Pine.

Chemical Seasoning of Lumber.

The Effect of Immersion in Deep Water of Cedar Fish Floats and Some Linseed Oil Treatments of Western Red Cedar. (Mimeographed.)

Spruce Gum. A Review of the Literature Concerning the Oleoresinous exudation from Red, Black, and White Spruce. (Mimeographed.)

Possibilities of the Use of Producer-Gas from Wood and Charcoal in Canada. (Mimeographed.)

The Strength of Dowel Joints. (Mimeographed.)
The Strength of Glued Joints.
Concentration of Water-soluble Preservatives in Treated Timbers. (Mimeographed.)
Distribution of Moisture in Poles with and without Sand-Creosote Collar. (Mimeographed.)
Fire-retardant Paints. (Mimeographed.)

Vancouver Laboratory

The Vancouver Laboratory is operated as a branch of the Ottawa Laboratories in co-operation with the University of British Columbia.

DIVISION OF TIMBER MECHANICS

Standard tests were carried out on western white pine, Douglas fir (mountain type), and yellow cedar; and special tests were carried out on Sitka spruce and western hemlock.

A study was advanced on the effect of the heart stain sometimes found in Douglas fir upon the strength of the wood.

In view of the importance of Sitka spruce for aeroplane construction, special attention was given to the effect of high kiln-temperatures on the strength of this species.

Tests were carried out on glued joints of various types submitted, and assistance was given in correcting trouble which had developed during gluing operations. Studies are in progress on three-ply Douglas fir glued by a " cold-press " process using a resin-blood glue.

At the request of the British Columbia Lumber and Shingle Manufacturers' Association, further tests on Douglas fir and western hemlock timbers of structural size were undertaken.

A great deal of time was devoted to assisting lumber firms, inspectors of aircraft, manufacturers of aircraft, and others in connection with the specification and testing of aeroplane spruce and other war materials.

DIVISION OF TIMBER PRODUCTS

Lumber Seasoning.—The study of moisture absorption, in unheated storage, of red alder, broad-leaved maple, western birch, and 3- and 4-inch western hemlock was continued.

An investigation was made into the cause of deterioration in partly seasoned western hemlock shipped to South Africa, and procedure regarding handling prior to shipment was recommended. This has been followed with improved results.

The investigation of the rusting of canned goods during ocean shipment in different kinds of cases was continued throughout the year in co-operation with the Research Committee of the Association of Marine Underwriters of British Columbia.

A test pile of Douglas fir and western hemlock ties was erected at a local creosoting plant to test the rate of air seasoning prior to preservative treatment.

A study was initiated to determine schedules, suited to modern kiln-drying practice, for seasoning Sitka spruce for aeroplane purposes without injury to the lumber.

Certain types of edge-grain Douglas fir were found to be subject to splitting in drying, as a result of which serious loss was caused. This matter was investigated with a view to detecting stock liable to splitting, and to kiln-drying it under a special schedule.

A satisfactory drying schedule was developed for kiln-drying 3-inch and thicker Sitka spruce aeroplane stock.

The following additional matters received attention: drying yellow cedar for venetian-blind slats, kiln-drying maple furniture lumber and hardwood veneer, and kiln-drying western hemlock for export.

The use of artificially induced humidity for the drying of western red cedar shingles in mechanical-circulation kilns was investigated, several test runs being made in a large dry-kiln.

Several kiln-runs were made on lumber immersed for varying periods in a salt solution. The results indicate that salt treatment retards surface checking to a marked extent, but causes a great deal of corrosion on metal work in the kiln.

A study was initiated in co-operation with a wood-preserving company to determine the effect of seasoning on Douglas fir treated with zinc chloride, for use in aeroplane hangars.

Utilization.—Information was assembled on the quantity of waste resulting from the manufacture of shingles and on the use of compressed "shingle hay" for insulation purposes.

Data were also assembled for the British Columbia Forest Branch on the utilization of red alder, broad-leaved maple, and western birch, as a result of which these species will be included in future cruise maps prepared by the Provincial Forest Branch.

Wood Pathology and Wood Structures.—Studies were continued on the cause and significance of streaky Douglas fir. Chemical analyses were made of wood constituents in the streaks which may have a bearing on this form of coloration.

Many minor problems were dealt with; those of chief importance were: brown-stain in a shipment of western red cedar shingles to the Atlantic Coast; the fungicidal properties of stain intended to camouflage western hemlock used for the storage of war supplies in the open; heart stain in western birch logs shipped to the Orient for match manufacture, to determine if this stain indicated decay; examination of lumber bulk-piled in large volume awaiting shipment owing to war emergency, to determine the incidence of decay.

One charge of western hemlock, balsam, and western red cedar containing various rot organisms, was dried for 6 days at a temperature of 130° F. and a constant relative humidity of 50 per cent. These drying conditions were found to be sufficient to sterilize the lumber.

Six shipments of Douglas fir were sent to the Forest Products Research Laboratory at Princes Risborough, England, for durability tests in comparison with Baltic species.

A study was completed on the relative efficiency of different chemicals for preventing sap-stain and mould on western white pine, western hemlock, and Douglas fir.

General.—Several serious paint failures reported to the Laboratories, chiefly on western red cedar siding, were found on examination to be caused by faulty methods of construction whereby paint was applied to the outside of the house before the interior was properly dried out.

Information on the protection from teredo attack of wharves and fender cribs in exposed areas by the use of dynamite was assembled for the Department of Public Works.

Assistance was given to a local veneer factory on the properties, uses, and availability of western birch for very thin veneer and plywood for aeroplane parts.

COMMITTEE WORK

Members of the staff of the Laboratory served on the following committees: Grading Rules Committee of the British Columbia Lumber and Shingle Manufacturers Association, Research Committee of the Association of Marine Underwriters of British Columbia, and Examining Board for Graders of the British Columbia Lumber and Shingle Manufacturers Association.

PUBLICATIONS

The following special publications were issued from the Vancouver Laboratory:—

Cross-grain in Lumber; Its Effect upon Strength. (Mimeographed.)
The Seasoning of Douglas Fir Timbers and Western Red Cedar Poles. (Mimeographed.)
Sap Stain and Mould Prevention. (Mimeographed.)
Outline of Wood Waste Utilization in British Columbia.
Chemicals in the Seasoning of British Columbia Timbers.

The Pulp and Paper Division, Montreal

The work of this Laboratory is carried out in collaboration with the Canadian Pulp and Paper Association and McGill University.

MECHANICAL PULPING STUDIES

Important data concerning the effect of stone sharpness, pressure, speed, and type of abrasive upon production and quality of pulp were obtained from experiments with a miniature grinder. Interesting results have been obtained by grinding wood longitudinally instead of transversely as in normal grinding practice. Pulp thus prepared differs markedly from normal groundwood pulp and is being studied with a view to eventual reduction or even elimination of chemical pulp in newsprint. Further tests have been made on pulpstones made from domestic garnet and high early-strength cement which were submitted for examination.

CHEMICAL PULPING STUDIES

Chemical pulping studies were directed to the mechanism of sulphite pulping, and also to an examination of factors which influence the yield and quality of sulphite pulp. Progress has been made in the evaluation of a modified sulphite process; certain technical difficulties have been encountered which may hinder large scale application of the process, but there is reason to believe that these difficulties can be overcome. An investigation of the effect of chipper knives on the pulping qualities of wood showed that compressive stressing of the wood by the knives may result in considerable degradation in both sulphite and kraft pulp. Considerable work was carried out on the preparation and nitration of wood-pulps for explosives.

PRINTING STUDIES

The investigation of the properties of paper which affect its printing qualities and of the effect of variations in furnish, stuff-processing, sizing, fillers and paper-making and surfacing processes, was continued in order to obtain data to assist in the selection and preparation of different types of paper for printing operations. Accurate measurements of ink transfer, blackness of impression, and printing smoothness have been made at known printing pressures to assist

in evaluating printing qualities of newsprint samples. An attempt has been made to measure the printing quality of paper or the faithfulness with which an impression can be reproduced, by scanning a sample of printed matter with an electric eye arranged to measure reflectivity of very small areas and record the results as a sample traverses the instrument.

POST-GRADUATE STUDENT INVESTIGATIONS

A number of students of McGill University were afforded facilities in the Laboratory to carry out investigations of problems closely allied with the interests of the pulp and paper industry, for thesis work for post-graduate degrees. Five of the investigators spent a large part of the academic session on war problems, suggested by the Advisory Committee of Industrial Chemists, functioning under the National Research Council of Canada.

GENERAL

The use of aluminium foil in calibrating Mullen testers was extended to most of the Canadian mills, as the result of work carried out in this Laboratory. A method of disintegrating pressed lapped groundwood was developed which delivers pulp with substantially the same physical properties as the slush stock from which the laps were formed. In collaboration with the Department of Public Works an empirical method was devised for differentiating paper-mill waste from natural detritus in samples from deposits in a harbour system where pulp-mills are located. As in previous years, the Division continued to perform testing services without charge for members of the Canadian Pulp and Paper Association, calibration of freeness testers, pulp-evaluation apparatus, pulp-fibre classifiers, oil-absorption testers, and replacement parts were also carried out. "Shingle hay" from western red cedar was satisfactorily converted on the laboratory scale into both insulating and hard-pressed boards, by the use of standard processing procedures.

At the request of the Canadian Government Purchasing Standards Committee, a detailed report by Dr. H. W. Johnston was prepared covering the investigations leading to the preparation of Tentative Specification 9-GP-1: "Instructions for the use of Tentative Specifications 9-GP-1-1939 (issued March 31, 1939), for the purchase by the Government of Fine Writing and Ledger Papers." Mechanical and chemical pulping tests were carried out on samples of white spruce, black spruce, and balsam fir containing high percentages of compression-wood.

COMMITTEE WORK

Representatives of the Laboratory served on committees of the following organizations:

The Canadian Pulp and Paper Association.—Committee on Industrial Waste, Wood Chemistry Committee.

The Canadian Government Purchasing Standards Committee.—Sub-committee on Paper Quality.

PUBLICATIONS

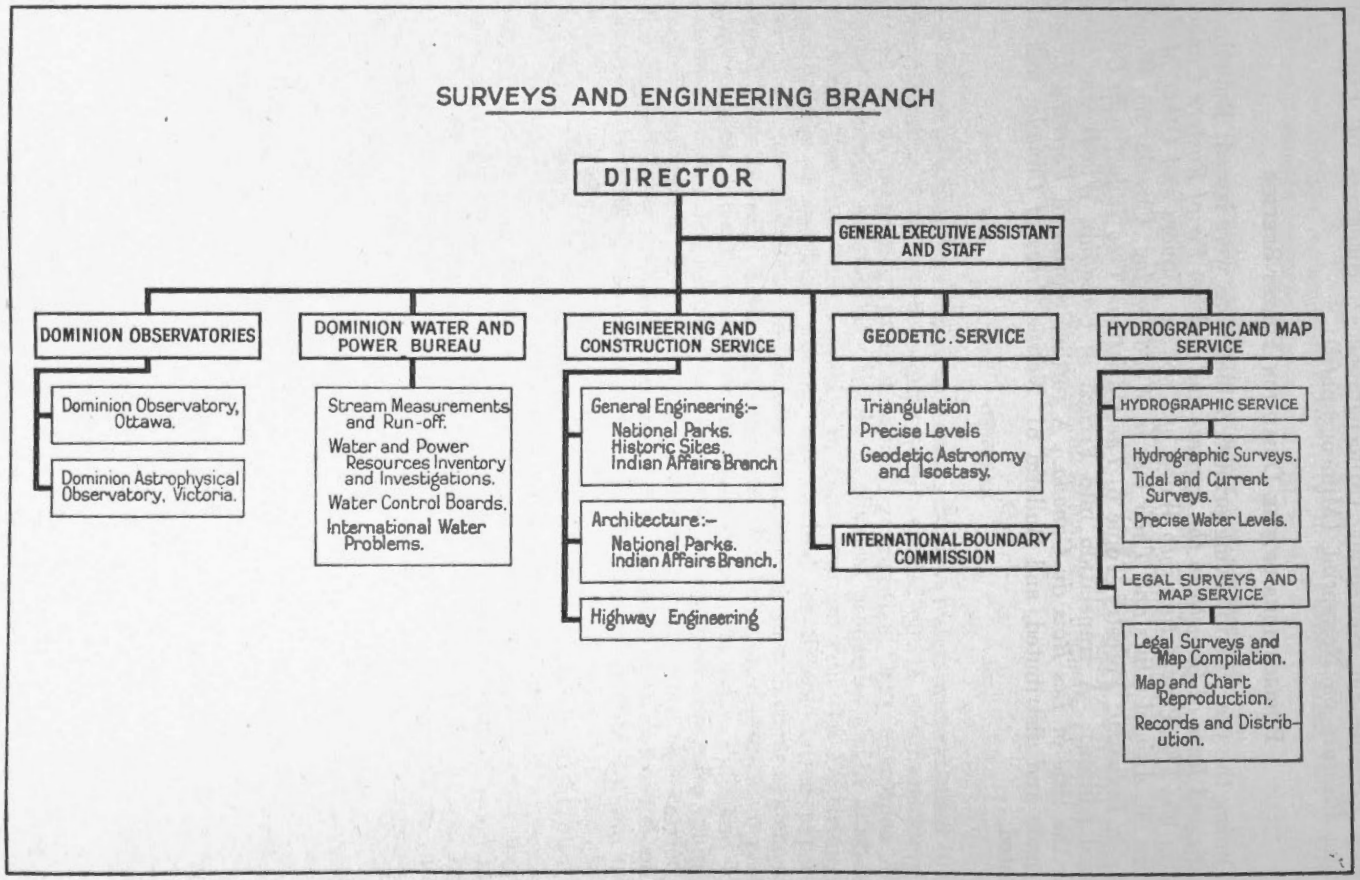
The following special publications were issued by this Laboratory:—

A Study of the Mechanism and Kinetics of the Sulphite Process; Advances in the Chemistry of Wood; The Measurability of Printing Quality; The Effect

of Chipping on the Suitability of Wood for Sulphite Pulping; Cellulose and Other Chemicals from Wood (excluding paper) (Mimeographed); Ink Transfer and Printing Pressure on Newsprint (Mimeographed); Blackness of Print and Printing Pressure on Newsprint (Mimeographed).

Publications of the Dominion Forest Service

During the year the following printed publications were issued: Bulletin 94, *Density and Rate of Growth in the Spruces and Balsam Fir of Eastern Canada;* Bulletin 95, *The Penetration into Wood of Cooking Liquors and Other Media;* Bulletin 96, *Animal Glues and Their Use in Woodworking;* Circular 55, *Wooden Tanks in Industry;* Forestry Topic 6, *The Christmas-Tree Industry in Canada* (revised edition). A translation into French of *Canadian Woods* was issued under the title of *Les Bois du Canada.* A further reprint of *Forestry Lessons* was made and distributed, and Bulletin 61, *Native Trees of Canada,* was also reprinted.



Organization Chart, Surveys and Engineering Branch.

SURVEYS AND ENGINEERING BRANCH

J. M. WARDLE, DIRECTOR

The Surveys and Engineering Branch is charged with the responsibility of undertaking in a correlated manner certain survey, scientific, and engineering work through the agency of the following services or units: 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.

The activities of the Surveys and Engineering Branch are provided for in the votes of its several Services. In addition this Branch undertook engineering and construction work and legal surveys for other branches of the Department, the funds for which were provided by the respective branches. The total expenditures are indicated in the following table:—

Regular votes	$1,301,012 15
Special votes	3,513,866 41
Miscellaneous gratuity	770 00
	$4,815,648 56
Less expenditure of monies made available to Mines and Geology Branch	839,511 56
Surveys and Engineering Branch, net total	$3,976,137 00

Plus expenditure of monies made available by other branches as follows:—

	Regular Votes	*Special Votes*	*Total*
To Engineering and Construction Service from			
Lands, Parks and Forests	$50,596 04	$1,049,277 38	$1,099,873 42
Indian Affairs	94,042 63	215,144 48	309,187 11
	$144,638 67	$1,264,421 86	$1,409,060 53
To Legal Surveys and Map Service from			
Indian Affairs	$10,982 59	.....	$10,982 59
Total Expenditure			$5,396,180 12

Since the outbreak of the war the Surveys and Engineering Branch has participated directly in Canada's war effort, assisting the Naval Service by making special hydrographic surveys and charts of certain ports and other important areas; the Air Service by the production of aeronautical maps; and the Military Service by the supplying of maps and survey data for use in special areas. Information was also supplied from time to time to the various War Departments on numerous matters related to the work of the branch.

Members of the staff have enlisted for active service in the Naval, Military, and Air Forces. Their duties have been allocated, as far as possible, to the remaining members of the staff in order to keep replacements to a minimum.

DOMINION OBSERVATORIES

The Dominion Observatory at Ottawa combines work on both practical and research problems, and the research programs have in the main been chosen with a view to producing practical results in association with the scientific questions investigated. The time service provides accurate time by wire and radio for the whole of Canada; the 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 the rock-bursts in hard-rock mines, to a study of the effects of Canadian earthquakes and their relation to 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 more practical aspects are associated the measurement of star positions, problems connected with solar rotation 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 and gravity, and other associated scientific 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.

DOMINION OBSERVATORY, OTTAWA

Observing conditions were considerably below normal. Astronomical observations were continued with five different telescopes. The geophysical programs were carried on as usual. Several meteor observation programs were again carried through successfully in co-operation with the Royal Astronomical Society of Canada. The Dominion Astronomer visited the Victoria Observatory and the seismograph station at Saskatoon. The seismologist spent two weeks with a seismic survey on the Blood Indian Reserve, Alberta; proceeding to Victoria he moved the seismographs from the meteorological station to the Observatory.

Annual reports were made to the Royal Astronomical Society, London, and to the American Astronomical Society. Lectures and papers were given at scientific meetings and to various societies, including the Dominion Astronomer's retiring vice-presidential address to the Astronomy section of the American Association, papers on mine rock-bursts, the St. Lawrence earthquake of October, 1939, and new laws of solar rotation and radiation. The services of an astronomer were as usual provided for instruction at five summer camps.

The Observatory was open to visitors each Saturday evening. Numerous daytime visitors, including school groups, were instructed on the several types of research and the instrumental equipment.

Position Astronomy and Time Service.—With the meridian circle 1,686 fundamental observations were made for right ascension and declination, and the computations continued.

Observations for correct time were made on 160 nights with a reversible transit. All mean time circuits, including the various time signals and the circuits operating chronographs, minute and seconds dials, seismograph shutters, and synchronization of outside clock systems, were controlled by the two signal clocks, synchronized continually from one of the primary sidereal clocks.

Time signals were sent continuously by wire to the railway telegraph companies and the Canadian Broadcasting Corporation. Wireless time signals were transmitted directly from the Observatory station CHU continuously, and through station VAA once daily, except Sundays and holidays. Beginning with November, Observatory time signals were transmitted through the Canadian Broadcasting Corporation chain of stations daily, replacing the previous broadcast restricted to the local station CBO. Correct time was also given to the very numerous telephone inquirers. The 1,000-cycle circuit from the Monitoring

Station was calibrated by comparison with the primary clocks, and was relayed by wire to the National Research Laboratories. Wireless time signals were received daily from Arlington, Bordeaux, Monte Grande, Nauen, Rio de Janeiro, and Rugby, and comparisons forwarded monthly to the International Time Bureau, Paris, and co-operating observatories. Experimental work with tube amplifiers provided improvement in transmission and reception of time signals, time records of earthquake waves, and synchronizing standard and secondary master clocks.

The time service in the various Government buildings in Ottawa was maintained with a minimum of interruptions and was extended to the Postal Terminal Building. The total number of electrically driven clocks is now 697. Clocks, chronometers, watches, and other timing mechanisms were cleaned, repaired, and rated for branches of this and other Government departments.

Tables of times of sunrise and sunset, moonrise and moonset, phases of the moon, eclipses, and differences of standard time, were prepared for distribution.

Terrestrial Magnetism.—Field observations entailed reoccupation of eight repeat stations for secular change, one at Long Island near Ottawa and seven in Alberta and British Columbia, and the establishment of four new stations off the British Columbia Coast at the request and with the assistance of the Hydrographic and Map Service. Field instruments were compared twice with the Dominion Observatory standards at Long Island. The index corrections of the compass of the standard Cooke Transit T.S. 1576, and of three compasses for use in Newfoundland were redetermined for the Hydrographic and Map Service and the Geodetic Service, respectively. Magnetic data were supplied to the International Union of Geodesy and Geophysics, the United States Coast and Geodetic Survey, the Department of National Defence, the Hydrographic and Map Service, and to organizations and surveyors on request. Reduction of observations to epoch 1930·0 was well advanced, and the British Canadian Arctic Expedition observations computed. An analysis of the magnetic observations made by this office in the areas of Hudson Strait, Hudson Bay, and Chesterfield in order to investigate certain movements of the magnetic field peculiar to these areas was begun. A knowledge of these movements is essential to the interpretation of observational data from the Canadian Arctic.

The two permanent magnetic observatories at Agincourt, Ontario, and Meanook, Alberta, operated with only slight interruption throughout the year. Continuous photographic records of the magnetic elements, horizontal force, vertical force, and declination, were obtained. Control was secured through absolute observations made with precise instruments several times each week. The instruments at Meanook were thoroughly overhauled, and intercomparisons were made with the Ottawa instruments for the re-determination of their index corrections to conform with the International Magnetic Standard, including re-determinations of variometer scale coefficients and the azimuth of the reference mark. Repairs and re-insulation were effected in the absolute instruments building for maintaining a more constant temperature during absolute observations. Quarterly reports on the magnetic character of the day and numerical intensity were forwarded regularly to the International Commission of Terrestrial Magnetism and Electricity at De Bilt. Annual results were furnished on request to Greenwich Observatory and copies of photographic records for specific days to several research institutions and investigators in different countries. Results of observations at Agincourt and Meanook for 1930 were published and distributed; those for 1931 are ready for printing, and those for 1934 and 1935 are in hand. Preliminary computations and reductions of all precise instrument observations were completed to the end of 1939. A special report on Agincourt magnetic data and the sunspot cycle appeared in the Journal of the Royal Astronomical Society of Canada.

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Seismology.—The seismological equipment at the central station, Ottawa, and at the outside stations, Halifax, Seven Falls, Shawinigan Falls, Toronto, Saskatoon, and Victoria, was maintained in continuous operation, with the exception of the time required for the transfer of the Victoria instruments from the Gonzales meteorological station to the new vault at the Dominion Astrophysical Observatory. As foreshadowed in last year's report, a short-period Heiland seismograph was installed at Lake Shore Mines, Kirkland Lake. It is being operated by the company and the records forwarded to Ottawa for study. This, together with further proposed equipment, will form the basis of a research program on rockbursts, to be carried on jointly by Lake Shore Mines and the Observatory.

Four hundred and eighty-four earthquakes were recorded in Canada, twenty-one of which were sufficiently well-defined for reports to the Press and by telegraph to Science Service, Washington. The most notable of these from the Canadian viewpoint was a quake which occurred in the St. Lawrence Valley on October 19. This was in the same general region as the quake of 1925, but was much less intense and accompanied by little damage. All Canadian registrations were regularly reported through the medium of the usual monthly bulletin distributed to the principal seismological stations of the world. Reports on the records obtained at the two Quebec stations were prepared each month and forwarded to the officers of the co-operating agency. Local registrations were reported as recorded to the central station of the Northeastern Seismological Association at Weston, Mass., in connection with seismic studies covering the northeastern States and Eastern Canada. The annual inspection and overhauling of the outside stations was carried out. The Bibliography of Seismology was continued though the usual collaboration was somewhat interrupted owing to the war.

Gravity.—Nine gravity stations which had been established in Ontario and Quebec in 1914 were re-occupied. The original observations were among the first to be made in Canada. Recent determinations combined with the unsatisfactory behaviour of the pendulum apparatus in the initial stages of its application in Canada gave reason to suspect that the results for the season of 1914 might be somewhat in error. Two of these stations have yet to be re-determined. The average error of the original nine determinations was found from last season's work to be 13 milligals, or, otherwise expressed, 13 thousandths of a centimetre per second. The probable errors of gravity determinations made by the Observatory in recent years have been usually less than one milligal, an accuracy that is essential in the application of the results to the determination of the form and nature of the earth's crust and to the control of gravitational surveys for oil and other purposes.

A report on the work of 1937 and 1938 was completed and published. This has revealed large and significant negative anomalies of gravity along the Atlantic Coast of Nova Scotia, along the Appalachian axis from the International Boundary to Gaspe Peninsula, and in the Lake St. John region. The report is accompanied by a map showing results for all gravity stations in Canada.

Solar Physics.—Fifty-five 9-strip spectrograms of the sun's centre, midway, and limb points, with iodine absorption spectrum, were obtained, and also 21 direct photographs. Cloudiness and haziness continued abnormally high.

Preparation for publication of 1911-1914 solar rotation observations was advanced. Two papers dealing with the new law of the solar rotation were published, in one of which the published rotation results were considered in relation to the law. A new law of distribution of solar radiation intensity from the disc was discovered, expressing intensity in terms of the cosine of the angle, ρ', between the line of sight and the normal to the solar surface at the

observed point, the cosine being raised to the power k λ, k being 0·3 when λ is in microns. The intensity of total observable radiation is closely proportional to the cube-root of cos ρ'. The new intensity law promises interesting applications to stellar problems of temperature, rotation, and eclipsing binaries.

Fifteen-inch Equatorial.—Observations with the 15-inch equatorial were restricted to the photo-electric photometer in a continuation of the program on alpha Virginis, eta Aquilae, delta Cephei, and zeta Geminorum, for which the usual preliminary reductions were made.

Photographic Photometry.—Observations with the photographic equatorial were continued on Cepheid variable fields for the determination of magnitudes of comparison stars and light curves. Plates were obtained of SW Bootis, Polaris, SU Cygni, R Coronae Borealis, SV and X Vulpeculae, and of comparison fields. Measurements of plates with the Kipp photometer were made on the following fields: RZ Cephei, RR Leonis, UX Persei, SY Aurigae, RT Scuti, and the north polar sequence.

Publications.—Four numbers of the regular series of Publications of the Dominion Observatory were issued as follows: Vol. XII, Bibliography of Seismology, No. 20; Vol. XIII, Bibliography of Seismology, Nos. 1 and 2; Vol. XI, No. 5, Gravity Determinations in 1937 and 1938. The following reports, pamphlets, and reprints were issued: Seismological Bulletin (monthly); Wireless Time Signals (monthly); Saturday Evening Program (quarterly); Reprint No. 34, The Law of the Solar Rotation; and Reprint No. 35, Agincourt Magnetic Data 1899-1937 and the Sunspot Cycle.

DOMINION ASTROPHYSICAL OBSERVATORY, VICTORIA, B.C.

The observing weather was 20 per cent poorer than the average. The 72-inch reflecting telescope was in use on 170 nights, and 845 spectrograms were secured in 1,004 observing hours, as compared with the 21-year averages of 202 nights, 1,319 spectrograms, and 1,247 hours. The necessarily longer exposures as observations are extended to fainter stars reduce the number of spectrograms proportionally.

The telescope was made available to visitors each Saturday evening. The summer evening attendance increased to between 150 and 200, and on July 29 over 400 were present to view the planet Mars at its near approach to the earth. About 24,300 visited the Observatory during the year, some 700 more than the average. Six instructive transparencies were added to those in the auditorium, bringing the number to twenty-four.

The ground floor of the dome building was rearranged to provide for a workshop, photographic room, observers' study, and two lavatories. The upper dark room was enlarged and a drying cabinet installed. The steel cables, sheaves, and guiding blocks of the dome, shutter, and platform mechanisms were renewed. The office building was renovated, and it and the engineer's house re-roofed. New lighting fixtures were installed in the office building and the auditorium, and the residences were painted.

Equipment improvements included: motorization of the iris diaphragm of the 72-inch mirror and the Cassegrain focussing mechanism; complete rewiring of the telescope for thermostatic control of the mirror; replacement of the wooden pendulum rods of the sidereal and meantime Dent clocks by invar; a second projection measuring machine designed and constructed locally, and the mounting of both instruments in a suitably darkened room; a new epidiascope; a small lathe, a drill press, and machine tools for the machine shop; and a portable gasoline forestry pump, supplied by the Department of Public Works as a measure of protection of buildings against fire.

The reforestation of Observatory Hill was continued by the British Columbia Forestry Department.

Six 10-inch naval signalling mirrors and one 6-inch army heliograph mirror were aluminized.

The two horizontal seismographs and the vertical seismograph, installed in the new vault during the year, were regularly serviced and the records forwarded to the Dominion Observatory.

The observation of spectrographic binaries, which for the past two decades has been a major contribution from Victoria, still occupies a considerable part of the observing time. More than a hundred binaries are under observation for the purpose of determining the masses and dimensions of eclipsing variables, and the orbits of double- and single-lined binaries. Special attention is given to the study of three-body systems and to apsidal motions. In a number of cases of double-lined eclipsing stars, a determination of the light ratios of the stars by spectro-photometric studies of the profiles of the lines at certain phases has proved of great value in calculating the absolute dimensions of the systems.

Studies of the velocities and line profiles of the absorption and emission lines of P Cygni are being carried out. The results suggest the existence of a definite sequence of early-type stars, including the Wolf Rayet, P Cygni, and super-giant A-stars, which may have definite physical relationships with the Novae. Several stars with peculiar and variable spectra which may be related to the P Cygni group are also under observation.

An extensive study of absorption bands in high dispersion laboratory, stellar, and cometary spectra leads to important conclusions regarding the physical conditions prevailing in comets and the late-type stars.

Observational programs now in progress include: (*a*) The radial velocities of the O-B5 stars north of the equator and fainter than magnitude 7·5; (*b*) Eclipsing variables and spectrographic binaries; (*c*) Studies of interstellar calcium and sodium lines; (*d*) Observations of the carbon bands in R- and N-type stars; (*e*) Research on the molecular bands in the M-type stars.

Seventeen technical papers were presented before four scientific societies; 15 astronomical lectures and 8 radio addresses were given by the staff, and 11 seminars on research problems were conducted at the Observatory. Two numbers of Volume VII of the Publications were printed and distributed, namely: No. 8, The Spectrographic Orbits of the Components of Boss 2112, by W. E. Harper; and No. 9, The Mass Ratio of the Lithium Isotopes Determined from the Red Bands of Li_2, by Andrew McKellar and F. A. Jenkins.

DOMINION WATER AND POWER BUREAU

The Dominion Water and Power Bureau investigates, analyses, and records the water and power resources of Canada in their Dominion, provincial, international, and interprovincial aspects and promotes water conservation and power development as a basis for the effective utilization of other natural resources, for the improvement of navigation, for irrigation, and for industrial and domestic requirements. This includes stream flow investigations which are carried out from coast to coast with the co-operation of the provinces.

With the exception of the Yukon and Northwest Territories and other lands of the Dominion such as Indian Reserves and National Parks areas, the water resources throughout Canada are vested in the provinces, and investigatory work is carried on in co-operation with the respective provincial authorities charged with the administration of these resources. The co-operative water resources and hydrometric work is undertaken through district offices located at Vancouver, Calgary, Winnipeg, Ottawa, Montreal, and Halifax. Investigatory work in the Yukon Territory is carried out through the British Columbia district office and in the Northwest Territories through the district office at Calgary.

WATER AND POWER

Lake of the Woods Regulation.—Run-off throughout the Lake of the Woods watershed was below normal and the amount of storage in the reservoir was considerably decreased. Lake level was at elevation 1057·91 on April 1, 1939, and rose slowly to elevation 1058·13 on May 31. In view of the small amount of storage available the release of water for power purposes was curtailed but lake level was steadily drawn down to elevation 1056·57 on March 31, 1940.

Lac Seul Regulation.—The direct regulation of Lac Seul is temporarily under the control of the Province of Ontario. During the fiscal year the run-off from the watershed was below normal. Lake level rose from elevation 1166·16 on April 1, 1939, to elevation 1170·33 on September 19, and was drawn down to elevation 1167·81 on March 31, 1940.

Snow Survey.—The twelfth annual snow survey in the Lake of the Woods and Lac Seul watersheds was carried out during the second week of March, in co-operation with the United States Engineer Office at Duluth, Minnesota. The results show that the water equivalent of the snow was 53 per cent of the average for the 12-year period.

Water Power Administration

The Priority Permit held by the Consolidated Mining and Smelting Company of Canada covering the two lower sites on Yellowknife River, Northwest Territories, was extended during the year and, later, the company applied for an interim licence to develop 4,000 horse-power at the upper of these two sites which is located at the entrance of the river to Prosperous Lake. Satisfactory plans and data having been submitted by the company in support of its application, a draft interim licence, under the Dominion Water Power Regulations, was prepared by the Bureau. When issued by the Department, it will permit the development to be undertaken.

A Yukon Water Power Grant covering a diversion from Klondike River and Lee Creek for the production of hydro-electric power near Dawson was renewed for a further period, as the original grant was nearing the expiration date.

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 completed early in 1939. This exhibit was designed to emphasize by an impressive grouping of models and scenes the key position of low-cost power in Canadian industry and in serving the domestic needs of the urban and rural population. Behind and above the group a map, 24 feet by 16 feet, showed the location and distribution of Canada's water-power resources both developed and undeveloped.

An officer of the Bureau was in attendance to answer inquiries and had available for free distribution an attractive illustrated publication, "Canada's Water Power Wealth", which had been especially prepared for this purpose. Other pamphlets and bulletins of a more technical kind were given to persons who sought specific information.

Technical Assistance to Indian Affairs Branch

During the year surveys were made to secure information required under the British Columbia Water Act in connection with water requirements on Indian Reserves. Applications were filed under that Act for conditional water licences for irrigation and domestic purposes on George Creek to serve Skuppah Indian Reserve No. 2, on Deep Creek to serve Soda Creek

Indian Reserve No. 2, on Gold Creek to serve Spuzzum Indian Reserve No. 2, and on Valley Creek to serve Williams Lake Indian Reserve No. 1. Three of these applications have since been granted by issue of the licences applied for. Twenty-five final licences were obtained in substitution of conditional licences, thus confirming the Indian rights to the use of water for irrigation and domestic purposes serving five reserves in the Kamloops Agency, nine reserves in the Lytton Agency, and one in the Williams Lake Agency.

A conference was held at Victoria which was attended by the Indian Commissioner for the Province of British Columbia, the Comptroller of Water Rights, and the District Chief Engineer of the Dominion Water and Power Bureau to review 25 conditional water licences appurtenant to Indian Reserves. Evidence in support of the Indians' requests for extensions of time had been prepared by officers of the Bureau and, by the finding of the Comptroller, an extension of time has been granted with respect to 14 licences, and surveys for final licences have been ordered in the remaining 11 cases. The findings are considered to be favourable to the Indians in every case.

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.

Following the outbreak of war, a systematic inventory was initiated of hydro-power sources and of power supplies available for war purposes. Through facilities of the various District Offices of the Bureau and by direct contact and correspondence with major power organizations a canvass was made of the situation in the more important power and industrial areas of the Dominion. This survey permitted of an appraisal being made of the amount of power available from existing facilities in excess of current requirements in any particular area or that might be made available with certain adjustments of existing demand. The undeveloped resources which might be considered as the most likely sources of additional power were also compiled.

Close co-operation was maintained with the Royal Canadian Mounted Police in the conduct of a Civil Security Survey organized for the prevention of sabotage. Transmission line maps, together with lists and descriptions of power plants, were furnished the police in connection with this undertaking.

The Water-Power Resources of Canada

As of January 1, 1940, Canada's total hydraulic installation was 8,289,212 horse-power or slightly less than 19 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

The large part played by the Central Electric Station Industry in Canada's hydraulic development is indicated by the fact that 7,292,499 horse-power or practically 88 per cent of the 8,289,212 horse-power installed for all purposes is utilized for the generation of electricity for sale to the public. Approximately 98 per cent of all electricity generated for sale in Canada and for export is hydraulic in origin and 95 per cent of the industry's power-generating equipment is operated hydraulically.

Practically all new hydraulic installation of recent years has been carried on by central electric station organizations. In the ten-year period between the end of 1929 and the end of 1939 the central electric station installation increased

by 2,475,013 horse-power as compared with an increase of only 87,037 horse-power for all other purposes, i.e. only 3½ per cent of the total installation of the past ten years has been developed by other than central station organizations.

DOMINION HYDROMETRIC SERVICE

The work of securing and compiling stream measurement records throughout Canada was continued. Records obtained in the field are brought together in one central agency, which undertakes the compilation and dissemination of stream flow data. For a number of years this work has been carried on by the Dominion Government under co-operative arrangements with the various provinces, and has operated efficiently both as regard field operations and office administration. 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 88 per cent of the long term mean in Kootenay River at Wardner to 133 per cent of the long term mean in Capilano Creek in the coastal area. In the Arctic and Western Hudson Bay drainage, typical stations showed a range in run-off from 25 per cent of the long term mean in Makwa River in central northern Saskatchewan to 71 per cent of the long term mean in Red Deer River at Red Deer in central Alberta. In southern Saskatchewan, in the Mississippi drainage, the yearly run-off of Horse Creek near the International Boundary was 111 per cent of the long term mean. A new minimum flow was recorded in Assiniboine River at Headingly in central Manitoba in the month of January. In the St. Lawrence and Southern Hudson Bay drainage, typical stations showed a range in run-off for the fiscal year from 66 per cent of the long term mean in Grand River at Galt in southwestern Ontario to 126 per cent of the long term mean in Madawaska River at St. Rose-du-Dégéle in eastern Quebec. In the Atlantic drainage, typical stations showed a range in run-off for the fiscal year from 68 per cent of the long term mean in Lahave River at West Northfield in southwestern Nova Scotia to 112 per cent of the long term mean in St. John River at Pokiok in central northern New Brunswick.

Power and Special Investigations

In the Northwest Territories, special arrangements were continued to secure flow records of the Yellowknife River at its mouth in anticipation of the development of water power on that river to supply the power needs of newly established gold mining properties in the Yellowknife area.

In British Columbia important hydraulic investigations 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. As a result of the construction operations being carried out by United States authorities at Grand Coulee dam in the State of Washington, slope studies were continued on Columbia River in the vicinity of the International Boundary in order that Canadian interests may be safeguarded. Close observation was continued of hydraulic and hydrometric conditions on Skagit River and Phillipps Creek where international problems may become active. The Department of Public Works was again assisted in a major hydraulic problem involving the development and maintenance of permanent ship channels in Fraser River from New Westminster to the sea. Extensive studies were carried out in the vicinity of the new Pattullo bridge over Fraser River at New West-

minster, at the request of the Premier of British Columbia, to determine the velocities and direction of flow under the bridge at various stages of tide and flow. Engineering studies of importance were made for other Dominion Government Departments including irrigation and water supply problems of the Department of Agriculture at Kamloops and on Windermere Creek, B.C. Engineers of the Bureau staff undertook for the Engineering and Construction Service of the Department supervision of construction of several important 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 from May 9 to October 23. The fourth annual Bow River snow survey in the vicinity of Lake Louise was carried out at the end of March. In co-operation with the Calgary Power Company, investigations were made in connection with future water storage and power possibilities on the upper reaches of Bow River and its tributaries.

In Saskatchewan and Manitoba, field and office studies were continued in connection with the Souris River problem which, during the year, was made the subject of a reference to 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, settlements were made with about 80 per cent of the owners of farm lands or summer homes along Winnipeg River in Ontario whose properties had been damaged by high water conditions in 1927 and 1938 as a result of the regulation of Lake of the Woods. Valuations were based on detailed surveys made by Bureau officers. On Niagara River, studies were continued throughout the year with respect to river slopes and discharge. In anticipation of possible flood prevention measures on Thames River, special attention was again given to flow conditions during the freshet season. At the request of the Chief Engineer of the Grand River Conservation Commission a special calibration of flood flow of Grand River at Galt was made during the freshet season of 1939. Special investigations were again made of hydraulic conditions on South Nation River in the vicinity of Plantagenet at the request of the Department of Public Works during the freshet period of 1939, and preparations were made for similar investigations during the flood season of 1940. Snow surveys were again undertaken for the Hydro-Electric Power Commission of Ontario in the watersheds of Wanapitei, Sturgeon, and South Rivers and similar surveys were also inaugurated in the Muskoka River watershed.

In Quebec, the securing of special hydraulic data on Richelieu River was continued in connection with the works being undertaken by the Department of Public Works under the approval of the International Joint Commission. For the Department of Public Works preparations were also made to carry out special hydraulic investigations of lower Yamaska River in connection with flood prevention measures. Other special studies included investigations of backwater effect; metering and rating outflow of storage reservoirs; hydraulics of Magog 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 1939 season.

In Nova Scotia, co-operation was afforded the Nova Scotia Power Commission in an investigation involving the diversion of water from Ingram River to St. Croix River for the purpose of increasing the power available for the pulp-making industry at Hantsport.

INTERNATIONAL WATERWAY MATTERS

Activity with respect to International Waterway matters was as follows:—

The Lake of the Woods Convention between Canada and the United States, signed February 24, 1925, provided for the securing of a flowage easement up to elevation 1064 sea-level datum upon all land bordering on Lake of the Woods in the United States, the cost of which was to be shared by the United States and Canada in accordance with the terms of the Convention. During the year a final settlement of Canada's share of the cost of securing the flowage easement was negotiated and the amount agreed upon was paid to the United States.

Hydrometric records were systematically secured on Roseau River in Manitoba, and its tributaries in connection with an international problem on this river referred by the Governments of Canada and the United States to the International Joint Commission for investigation and report.

Attention was given to several problems of an international character which arose in the Columbia-Kootenay River basin during the year. These included investigation and preparation of material concerning the possible effect of backwater from the Grand Coulee dam, under construction on Columbia River in Washington, upon interests in Canada at and above the International Boundary; the investigation of further flood control on Kootenay Lake and the development of discharge curves to assist control of lake levels.

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 Lake of the Woods Control Board, 1919; The International St. Mary and Milk Rivers Board of Control, 1921; and The International Kootenay Lake Board of Control, 1939. The activities of these Boards required a large amount of technical information which was supplied from time to time by the Dominion Water and Power Bureau. Particular mention is made of the continuous work by the Bureau in connection with the Niagara Board of Control, the Lake of the Woods, St. Mary and Milk Rivers, and Kootenay Lake Boards.

REVENUE

During the year contributions in support of the co-operative water resources studies were received from the provinces to the amount of $30,973. Payments in connection with the 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 $80,616, and revenue from water-power licences, etc., to the extent of $701 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 the Indian Affairs Branch and remitted to that Service.

PUBLICATIONS

During the year Water Resources Paper No. 78, dealing with the surface water supply of the Pacific Drainage in British Columbia and the Yukon Territory from October 1, 1932, to September 30, 1934, was published. Water Resources Paper No. 76, for 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 in press at the end of the year. The regular annual bulletins on Hydro-Electric Progress

in Canada during 1939 and the Water Power Resources of Canada, 1940, were issued as usual. The illustrated publication "Canada's Water Power Wealth", prepared for distribution at the Water Power Exhibit, New York World's Fair has already been mentioned.

ENGINEERING AND CONSTRUCTION SERVICE

The Engineering and Construction Service acts as a general engineering unit to the various branches of the Department. The work includes the preparation of plans, estimates, specifications, and designs covering all construction activities in addition to the undertaking of actual engineering and architectural work relative to both maintenance and construction, as well as acting in an advisory capacity on technical matters for non-technical services of the Department.

Funds allotted to this Service from regular departmental votes were expended on maintenance of roads, erection of buildings, protection work, hard surfacing of roads in National Parks, including preparatory work, and works at various historic sites.

The architectural work performed included the preparation of plans, specifications, and estimates for buildings and landscape work to be undertaken by the Department; the examination and approval or revision of plans of buildings proposed to be erected by private individuals in National Parks, and the examination of reports and returns made in connection with construction of buildings.

Under Special Supplementary Estimates, funds were provided for highway, bridge, and building construction. Funds were also provided to cover Dominion contributions to approach roads to National Parks and to tourist highway development, work on both classes of roads being covered by Dominion-Provincial agreements.

A description of the more important construction and maintenance projects undertaken by this Service follows.

HIGHWAYS

Golden-Revelstoke Highway

Goldstream Northerly.—Work on this section of the Golden-Revelstoke Highway, which forms part of the Trans-Canada Highway, was continued from two bases, namely, Donald for operations from the east and Revelstoke for operations from the west. During the 1939 season main grading operations were completed and the construction of the last link in the Trans-Canada Highway in British Columbia was accomplished. Certain work still remaining for the 1940 season includes re-shaping of road section; surfacing of certain sections, and related work. Construction work carried out during the period included the following: new road constructed, 13·8 miles; surfacing (gravel), 17·1 miles; maintenance, 40·0 miles; bridges, two 109½-foot, through truss spans, and one 80-foot pile trestle.

Work commenced on April 24 and closed down November 4, at which date the road was connected up between Golden and Revelstoke. Maintenance was carried out on the section of road between Goldstream and Columbia River Crossing. Grading work done on the two sections included the excavation of 233,000 cubic yards of material, of which 25,000 cubic yards was solid rock. The maximum force during the season was 432 men.

Banff-Jasper Highway

Banff Park Section.—Maintenance was carried on over the completed road from Mile 0 at Lake Louise Junction to Mile 52. Two truss bridges were repainted. During the 1939 season this project was completed by this Service, which had been engaged on construction operations since the inception of the work as a relief project in 1931. The total length of the project is 148 miles of which 80 miles are in Banff Park and 68 miles in Jasper Park. Construction work accomplished in the 1939 season in Banff Park, which completed that section of the highway both as to grading and surfacing, including the following: clearing, 6·8 miles; grubbing, 9·6 miles; grading, 14·42 miles; gravel surfacing, 16·61 miles, and one 70-foot span truss bridge.

Grading of the above section included the excavation of 93,000 cubic yards of material, of which 9,300 cubic yards was solid rock. The maximum force during the season was 299 men.

Jasper Park Section.—Maintenance was carried on over the completed part of the road in Jasper Park from Miles 1 to 61, and in Banff Park southerly for about 4 miles. Widening and improvement work were carried out between Miles 45 and 57, comprising 12·75 miles. A total of 21,345 feet of guard rail was erected in this section. Dust layer oil was spread on the first 27 miles of road.

Construction carried on from the Jasper base comprised the following work which connected up with construction from Lake Louise at the close of operations: grading, 4·99 miles; gravel surfacing, 9·83 miles; bridges—treated timber truss 1, steel girder 2, common 1; hub guard, 17,405 linear feet.

Grading of the above section included the excavation of 102,600 cubic yards of material, including 9,700 cubic yards of rock. The maximum force during the season was 269 men.

Cabot Trail

Approximately 45 miles of the Cabot Trail Highway in northern Cape Breton is located in Cape Breton Highlands National Park. About 5½ miles of new construction was completed under contracts started the previous season and construction operations were carried on under a new contract over an additional 8½ miles. Work on this latter section was about 80 per cent completed at the end of the season. Total work done included the following: clearing, 38·23 acres; grubbing, 14·43 acres; grading, 12·3 miles. The greater part of this work was carried out in very difficult country and involved heavy grading. Work was undertaken on the Cap Rouge, Jumping Brook, Mackenzie Mountain, and South Harbour sections and included the handling of 260,000 cubic yards of material, of which 123,000 cubic yards was solid rock.

Several new location lines were run on the east coast between Neil Harbour and Warren Brook from which total, together with portions of surveys previously run, a final location line of 11·15 miles was selected and is being considered as an alternative to the existing road in this area.

Entrance Highways from International Boundary and 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 permanent surfacing of the main tourist route from Kingsgate on the International Boundary to the southerly 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 the work should be completed by 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 not to exceed $190,000. This full amount was earned and paid to the Province. 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 1939 season about 23·2 miles of highway were constructed to standard section, involving the moving of 275,000 cubic yards of material. In addition to this 37·16 miles of bituminous pavement were laid.

The following amounts have been contributed by the Dominion under the two Agreements since their inception:—

1936-37	$ 92,877.25
1937-38	136,416.59
1938-39	174,845.14
1939-40	190,000.00
	$594,138.98

TOURIST HIGHWAYS

The Engineering and Construction Service was responsible for the administration of Dominion contributions towards development of tourist highways in the Provinces of British Columbia, Alberta, Ontario, New Brunswick, Nova Scotia, and Prince Edward Island. The work in each province was covered by agreements between the Dominion and Provincial Governments and provided for the construction of certain approved highway projects by each province 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 agreement stipulated that a stated percentage of those employed were to be taken from relief rolls or to be those who, but for such work, would have been in necessitous circumstances. All field work on these projects was inspected periodically by engineers of the Engineering and Construction Service and all claims for payment of the Dominion's share of expenditures were examined, checked, and certificates issued by this Service.

Following are tables showing the maximum allotment for each province, contributions by the Dominion, and employment afforded:

Tourist Roads—1939-40

Man Days worked during period Dominion contributed to the Provincial Expenditure

Province	Relief and Needy Man Days	Total Man Days
British Columbia	41,001	53,865
Alberta	30,037	44,534
Ontario	165,354	221,225
Nova Scotia	38,504	69,260
Prince Edward Island	27,662	36,809
New Brunswick	23,140	34,867
	325,698	460,560

Tourist Highway Agreements
1939-40

Province	Dominion Commitments	Payments by Dominion
Nova Scotia	$250,000.00	$250,000.00
New Brunswick	245,000.00	245,000.00
Ontario Vote 522	950,000.00	950,000.00
Ontario Vote 512	103,772.50	55,950.34
Prince Edward Island	60,000.00	60,000.00
Alberta	275,000.00	275,000.00
British Columbia	340,000.00	325,689.24

SUMMARY OF WORK BY PROVINCES, TOURIST HIGHWAY PROGRAM, 1939-40

Prince Edward Island.—Work was undertaken on the following roads: Brackley Point, Bedford, Margate, Commercial, Murray River to High Bank, Borden, Wood Island, Orwell to Eldon, and York. Work included: grading, 32·89 miles; gravelling, 30·39 miles; bituminous surfacing, 0·75 mile. Width of grading was 30 feet and of gravelling and bituminous surfacing, 18 feet. Gravel applications varied between 515 and 700 cubic yards per mile.

New Brunswick.—Work was undertaken on the following roads: Edmundston to Baker Brook, Baker Brook to Clair, St. Croix to Thomaston Corner, Long's Creek to Thomaston Corner. Work included: grading, 21·6 miles; gravel borrow, 21·6 miles; asphaltic concrete, 20·63 miles. Grading is 30 feet wide and bituminous surface, 20 feet. Bituminous surface includes a 2-inch base course application.

Nova Scotia.—Work was undertaken on the following roads: Port Hawkesbury towards Inverness, Margaree Forks toward Grand Etang, Baddeck to Ross Ferry, Macdonald's Corner Cape North to White Point, Margaree Forks to Dunvegan, Swamp road to Carmichael's Garage, and Cape Smoky. Work included: grading, 36·89 miles; gravelling, 37·09 miles; base course, 15·0 miles. Grading varied in width between 22 and 28 feet and included certain bridges. Gravelling varied between 18 and 22 feet in width.

Ontario.—Work was undertaken on the following roads: Nipigon-Beardmore, Blind River, Fort William, Lundy's Lane, Camp Borden, Jellicoe-Bankfield, Echo Bay, McCrimmons North, Cutler West, Fort Frederick, Montreal River South, Nestor Falls South, to Point Pelee Park, Niagara Park driveways, and Fort Erie traffic circle and Henley Bridge. Work included: grading, 56·95 miles; gravelling, 53·85 miles; bituminous surfacing, 22·0 miles; concrete surfacing, 15·51 miles.

Alberta.—Work was undertaken on the following roads: Calgary-Crossfield, Crossfield-Red Deer, Ponoka-Millett, Okotoks-Waterton Lakes Park, Walsh-Redcliff, Lethbridge-Monarch, Edmonton-Jasper. Work included: grading, 54·48 miles; gravelling, 151·97 miles; bituminous surface, 93·94 miles; bituminous seal coat, 194·77 miles. Gravelling operations included replacement surfacing, base course and aggregate for bituminous surface treatment.

British Columbia.—Work was undertaken on the following highways: Peace Arch, Southern Transprovincial, Northern Transprovincial, Prince George-Okanagan, Huntingdon-Mission, Nelson-Nelway, Rossland-Paterson, Lougheed, Golden-Yoho Park, North Thompson, Spence's Bridge-Merrit-Princeton, Trail-Pend Oreille-Salmo, and Trans-Canada. Work included: grading, 73·32 miles; gravelling, 48·44 miles; bituminous surfacing, 5·87 miles; bituminous seal coat, 1·10 miles; miscellaneous improvement, widening, and straightening and bridge construction.

ENGINEERING WORK IN NATIONAL PARKS

Banff National Park

Castle-Vermilion Road.—General maintenance of this road which is 9 miles in length and leads from the Trans-Canada Highway at Castle to Kootenay Park at Vermilion Summit on the Interprovincial Boundary, was carried on throughout the summer season. Work included regrading, ditching, and patching sections of the road; preparation of the road surface and spreading dust-laying oil.

Trans-Canada Highway.—General maintenance of this road was carried out between Mile 9 West of Banff and Mile 38, at Lake Louise Station. Work included regrading, ditching, and patching sections of the road; preparation of the road surface and spreading dust-laying oil. Two applications of oil were given between Miles 9 and 21, and one application between Miles 22 and 38.

Reconstruction of the road was completed, in preparation for hard-surfacing, from Mile 14·85 to Mile 31·9 with the exception of one mile between Miles 23 and 25. A new revision was constructed in Miles 34 and 35, and reconstruction undertaken in Miles 36 and 37. The construction of a 30-foot concrete deck girder bridge was completed with the exception of parapet walls over Johnson Creek.

On the main highway west of Banff a contract was awarded for eight and one-half miles of bituminous surfacing. The pavement was laid to a width of 20 feet for a total distance of 8·54 miles, and a seal coat was applied over 4·2 miles.

Jasper National Park

Jasper Park Lodge Road.—The road from Jasper to Maligne Canyon and Maligne Lake was diverted under arrangement with the Canadian National Railways to avoid passing through the Jasper Park Lodge grounds. Under this arrangement the Company agreed to erect a 225-foot steel bridge over Athabaska River at a point 2·7 miles below Jasper townsite. The Dominion agreed to construct the necessary approaches and highway to connect with the existing road to Maligne Canyon. By the end of March, 1940, the steel bridge with concrete abutments had been erected by the Canadian National Railways and the east approaches were constructed by the Engineering and Construction Service, connecting with the Jasper-Edmonton Highway. The latter work involved cutting and clearing the right-of-way, a fill of 26,000 cubic yards, and gravel surfacing of the graded road.

Jasper-Edmonton Highway.—A large program of culvert and trestle bridge replacement was undertaken between Miles 13 and 28. This included two 50-foot steel and concrete girder bridges, three creosoted timber box culverts, and one trestle fill.

Waterton Lakes National Park

On the Chief Mountain Highway, preparatory work for paving, including installation of 67 new creosoted wood-stave culverts, and preparation of the road surface was carried out over its entire length between the International Boundary and the north boundary of the park. Preparatory work was also undertaken on 1·06 miles of the main entrance road between Waterton River bridge and Waterton townsite.

A contract was awarded for the bituminous surfacing of the Chief Mountain Highway from the International Boundary to the Waterton River bridge, 14·7 miles, and an additional 1·5 miles to the Pincher Creek entrance at the

north boundary of the park. The bituminous mulch was laid to a width of 18 feet from the International Boundary to the Waterton River bridge when winter conditions caused the closing down of the work.

Prince Albert National Park

Surveys of portions of the Prince Albert Park Highway and of the Spruce River revision were carried out. Construction on the latter section was completed. A total of 1·48 miles of new road was constructed and gravelled, and one timber truss bridge of 44 feet span with 22 feet clear wheelway was erected. In addition some clearing and grubbing was done on four small revisions.

Riding Mountain National Park

Preparatory work for hard surfacing was carried out on Wasagaming Drive at Clear Lake and on the main entrance road from the South Gate, including installation of 26 corrugated iron culverts. Asphaltic mulch paving was put down on these sections, some 51,290 square yards of paving being laid to a depth of 3 inches in widths varying from 40 feet in the business section to 20 feet on the approach road, equivalent to 4·3 miles of pavement 20 feet wide.

Point Pelee National Park

The main road was surveyed for a total of 5·87 miles. Trees were cleared along this length to straighten the road which was widened to 22 feet. Clay filler was spread over the grade and gravel surfacing material was spread for 3·5 miles.

The building known as the "Post Residence" in the south section of the park was remodelled and renovated with a view to the first floor being used as living quarters for the Park Superintendent, and the second floor as temporary seasonal quarters for the Royal Canadian Mounted Police. A septic tank and complete pressure water pumping system was installed. An entrance archway and safety island were constructed, completing an entrance group with the existing buildings at this point.

Cape Breton Highlands National Park

Buildings.—The erection under contract of the Administration building, Superintendent's residence, and Entrance lodge was completed and the contract for the erection of the bath-house was approximately one-half completed.

Prince Edward Island National Park

Contracts were let and a start made on the erection of a golf club-house and equipment storehouse at the Green Gables golf course. Owing to severe weather conditions, work was suspended on both structures during the winter.

HISTORIC SITES

Champlain's Habitation, Port Royal, N.S.—After much research, work was undertaken by day labour on the reproduction of Champlain's Habitation at Port Royal, N.S. The Habitation has been reconstructed as nearly as possible on its original site, and as nearly as practicable it is a replica of the trading and colonizing settlement which was built in 1605. The Habitation comprises a group of buildings arranged around a courtyard in the manner of 16th century farms in France, and is fortified at the two southerly corners by a cannon

platform and stockade or palisade. Structural materials and construction details conformed as far as possible to contemporary building practice in the north of France, using local materials where suitable following the probable original scheme.

Louisbourg Fortress, N.S.—Work at this site consisted of completing the excavation at the Citadel building and restoration of the walls in conformity with work of previous years; excavation at the west wing of the hospital; demolishing cairn at the King's Bastion and re-erecting the tablet at the entrance to the Citadel; construction of a new entrance gateway; construction of a new telephone line; waterproofing of the walls of the museum building and caretaker's quarters; installation of septic tanks and drains for new toilets.

Fort Beausejour, N.B.—Work at this site included the construction of a picnic shelter building in which was incorporated an antique fire-place; closing in the pavilion with windows and doors; raising the stone curtain wall two courses; constructing three small concrete gun-bases; levelling recreation area; lowering existing drain and connecting same to the sump in the museum furnace room.

Fort Monckton, N.B.—Work at this site included repair of the existing sea-wall damaged in severe storms in the winter of 1938-39; extension of the wall along the entire boundary of the fort property facing the sea, and construction of a new section to replace a washed-out section; erection of angle-iron fence around the old military cemetery; deepening existing well to secure supply of fresh water; construction of a small tool-house.

Fort Chambly, Que.—Work at this site included the continuation of the concrete protection wall from Pontchartrain Street to the northwesterly bastion of the fort; erection of an angle-iron picket fence along Fort Street in front of the old cemetery; waterproofing museum basement; rebuilding stove at picnic grounds; erecting two road signs.

Fort Lennox, Que.—Work at this site included repairing and repointing stonework of various buildings, including the powder magazine, men's barracks, officers' quarters, guard room and north and south gateways; painting roofs of artillery and commissariat buildings and bridge railings.

Birthplace of Sir Wilfrid Laurier, St. Lin, Que.—A new site was cleared and graded and the old house in which Sir Wilfrid Laurier was born was moved to the new location. The house was completely renovated, new veranda constructed, electrical and plumbing work installed, new walks built in the surrounding grounds, shrubs and perennials planted, and a fence constructed around the property.

Birthplace, Louis Phillippe Hebert, Ste. Sophie d'Halifax, Que.—A bronze tablet affixed to a metal standard was erected to mark this site.

Fort Wellington, Prescott, Ont.—A tar penetration macadam one-way entrance road was constructed; an area northeast of the fort was surfaced with stone chips as a parking area; an entrance gateway was constructed consisting of two rubble stone walls surmounted with granite caps and copings; alterations in and additions to the museum were made to display articles to the best advantage; the memorial bell tower was razed and the bell turned over to local authorities.

Fort Malden, Amherstburg, Ont.—A new museum of Colonial design was erected under contract at this site. The building was constructed of rubble masonry and is rectangular in plan, being 57½ feet in length and 22½ feet in

width. It contains a large exhibit room with a fireplace at each end. Toilet facilities for tourists have been provided. An ornamental iron fence with stone piers was erected along the front of the site, the approach was graded and sodded, and a flagstone walk was laid from the entrance gate to the museum.

WORK ON INDIAN RESERVES

Work for the Indian Affairs Branch carried out by this Service comprised the following:—

Buildings.—Salmon River, N.S., one-room day school, with work room, to accommodate 40 pupils; Eel Ground, N.B., one-room day school, with work room, to accommodate 40 pupils; Maria, Que., two-room day school and teacher's quarters, with work shop and sewing room to accommodate 60 pupils; Six Nations, No. 9, Ont., one-room day school with work room to accommodate 50 pupils; Mud Lake, Ont., two-room day school with work room and sewing room, to accommodate 80 pupils; Sucker Creek, Ont., one-room day school with work room and teacher's residence, to accommodate 40 pupils; Metagami, Ont., one-room day school with work room and teacher's residence, to accommodate 40 pupils; Sandy Bay, Man., enlargement and reconstruction of the residential school to accommodate 80 pupils; Cross Lake, Man., enlargement and reconstruction of the residential school to accommodate 80 pupils; Seton Lake, B.C., one-room day school with domestic science and manual training rooms, to accommodate 30 pupils; Alberni, B.C., residential school, to accommodate 200 pupils; four-room day school with machine shop and manual training to accommodate 160 pupils. (Not completed during the period.)

Contracts were awarded for the erection of all of these buildings except Sandy Bay and Cross Lake which were carried out by day labour.

Other Projects

In addition to various Indian Reserve irrigation projects carried out by the Engineering and Construction Service with the assistance of the staff of the Dominion Water and Power Bureau, which is referred to in the report of the latter Bureau, the following miscellaneous work was undertaken by the Engineering and Construction Service for the Indian Affairs Branch:—

British Columbia

Vancouver Agency.—Repairs were made to the water supply system at Sliammon Village.

Alert Bay Residential School.—Repairs were made to the fire protection equipment.

Katzie Reserve No. 1.—A new water supply system was constructed to serve this village.

Comox Reserve No. 1.—A report was prepared on the development of a water supply system.

Kamloops Residential School.—A settling basin for the septic tank system was constructed.

Upper Similkameen Reserve No. 4.—River bank protection work was constructed.

Port Simpson Reserve.—Replacements of portions of the domestic water supply system were completed.

Kitsegukla Village.—The installation of a domestic water supply system was completed.

Lejac Residential School.—Inspection and report were made in connection with the septic tank at the school.

Bella Coola Agency.—Inspections were made at the Bella Bella School in connection with reported leakage in the basement, of the wharf at Bella Bella in connection with repairs, and of the water supply system.

Kitimat Village.—Certain improvements were carried out to the domestic water system serving this village.

Kitkatla Village.—A survey was made with the idea of developing a water supply system.

Alberta

Peigan Agency.—An inspection and report were made and specifications were prepared for a lighting plant for the hospital and Agency buildings.

Driftpile Agency.—An inspection and report were made and specifications for lighting plant, water, and sewer systems were prepared.

Sacred Heart School.—An inspection and report were made and specifications were prepared for replacement of lighting plant engine.

Morley, Royal Canadian Mounted Police Barracks.—An investigation of the water supply was made.

St. Paul's School.—A water softener was installed at the school.

Winterburn Agency.—A pumping unit was installed.

Grouard, Joussard, Vermilion, and Sturgeon Lake Residential Schools.—The construction of water supply systems.

Saskatchewan

Inspections, preparation of specifications, and in some cases examination of tenders were carried out in connection with new lighting plants, water supply and sewage disposal systems at the following: Cowesses and Guy Schools, Carlton Agency, Touchwood Agency, Lac La Ronge Residential School, and Qu'Appelle Agency.

Beauval Residential School.—Installation of the hydro-electric plant was completed.

Round Lake Residential School.—Inspection and report regarding necessary reconstruction of the school buildings were made.

Manitoba

Inspections, preparation of specifications, and examination of tenders for such services as water supply, lighting, and sewage disposal were among the duties performed at Portage la Prairie, Elkhorn, and Sandy Bay Residential Schools, Norway House Agency, and Fisher River Agency and Hospital.

Brandon Residential School.—An inspection and report were made and improvements to the water supply were effected.

Birtle River Residential School.—A new water supply line was laid.

Fisher River Day School.—General repairs to school and drainage lines were carried out.

Ontario

Inspections and reports were made covering drainage, roads, bridges, etc., at Tyendinaga, Walpole Island, Cape Croker, Christian Island, Parry Island, Gibson, and Shawanaga Indian Reserves.

Christian Island.—Plans and specifications were prepared for a scow ferry, for breakwater for wharf, and for lighting plant.

Tyendinaga Reserve.—Plans and specifications were prepared for cottage, granary, piers of church towers, and bell cupola.

Cecilia Jeffreys School.—A report was made on the rehabilitation of the sewage disposal system.

Cedar Point.—Plans and specifications for wharf were prepared.

Mohawk Chapel, Brantford.—An inspection was made of completed work.

Mohawk Institute, Brantford.—An inspection was made of heating and plumbing installation and general conditions at the Institute.

Fort Albany.—Plans were prepared for proposed new residential school.

Kenora Residential School.—Inspection and report on sewage disposal at the school were made.

Chapleau Residential School.—Inspection and report on the water supply for the school were made.

Quebec

Restigouche and Seven Islands Reserves.—Specifications for lighting plants were prepared.

Lorette Indian Reserve.—Inspection and report on the water supply were made.

Caughnawaga Indian Reserve.—An investigation was made of reported flooding of areas from water on Reserve.

Abenakis Indian Reserve.—An inspection and report on drainage at Pierreville were made.

Nova Scotia

Millbrook Reserve.—An inspection and report on drainage of basement of school were made.

Northwest Territories

Fort Norman Reserve.—Specifications for a motor-driven pump for the new Agency building were prepared.

GEODETIC SERVICE OF CANADA

The Geodetic Service of Canada continued its work of determining the exact geographical position of horizontal control points throughout Canada by means of geodetic triangulation or traverse, and geodetic astronomy. All points so located as to latitude and longitude are based on the North American Datum.

The establishment of accurate vertical control for Canada is also a responsibility of the Geodetic Service and, to this end, bench marks are established throughout the Dominion by means of precise levelling operations, the resulting elevations being based on mean sea level. Elevations obtained through engineering levelling, generally, are collected, correlated, and adjusted so as to place all elevations in Canada on the same sea level datum, known as the Canadian Geodetic Datum.

The exact location of points in the Dominion, both as to latitude and longitude, and as to elevation, provides a sound basis for all other survey work in Canada, serving Dominion, provincial, and private needs. All engineering works, such as the construction of highways, railways, canals, hydro-electric development, and irrigation, benefit greatly from the information made available by the Geodetic Service.

In addition to triangulation and precise level work, the Geodetic Service undertakes research work in the practical applications of geodetic astronomy and isostasy. Work is also carried on in geodetic research.

Geodetic information was supplied from time to time to various Government organizations directly engaged in the present war effort. In this connection a number of engineers of this Service were loaned to other branches and departments.

TRIANGULATION

Field work in 1939 was continued in two districts, namely, British Columbia and Newfoundland.

British Columbia

The Williams Lake-Edmonton Net.—The triangulation of British Columbia covering the coastal region and extending to the interior of the province reached Williams Lake in 1936. From this point a link of triangulation was required to connect with work in the vicinity of Edmonton. In 1939 this connecting link was carried eastward from Williams Lake to the Yellowhead Pass, thus completing the most difficult part of the operation. The region crossed is mountainous and possesses glaciers and lakes of considerable size. Quesnel Lake is navigable for a distance of 70 miles. Prospecting for minerals is being carried on here. Nine of the eleven stations occupied were on ice and snow-covered peaks at elevations from 8,000 to 10,000 feet. Camped at the summits of these mountains, the engineers performed their work during the hours of darkness for several nights at a stretch. The required precision was attained despite the difficulties of the task. The remaining part of the net, from Yellowhead Pass to Edmonton, lies in comparatively open country, and little difficulty is anticipated.

Newfoundland

In 1935, the Government of Canada entered into an agreement with the Commission of Government of Newfoundland to carry on the geodetic triangulation of the island. The Geodetic Service of Canada was called upon to provide the technical officers and instrumental equipment and finally to publish the mathematical data. The Commission agreed to bear all the travelling expenses and field costs. The triangulation progressed during the working season of each year since. Three parties operated in 1939 to establish a net along the west coast from Bay of Islands northward towards the Strait of Belle Isle. A station preparation party followed by two angle-measurement parties operated in this area.

Delays caused by foggy and rainy weather, together with difficulties in moving along the exposed seacoast in small boats, restricted progress considerably, and only 13 new stations were occupied by the angle measurement parties during the rather short field season. Work was discontinued for the season just north of Parsons Pond.

LEVELLING

Precise levelling operations were carried out in the Provinces of Manitoba and Ontario. The Manitoba party completed the levels along the Hudson Bay Railway from the second crossing of Nelson River at Kettle Rapids to Churchill. At the latter point, the levels were closed on a bench mark the elevation of which above mean water level in Churchill Harbour had been established by means of an automatic tide gauge. This gauge has been maintained during the summer months since 1929 by the engineers of another department. The elevation of this bench mark derived from the levels along the railway and based on the precise level net was six-tenths of a foot higher than the elevation derived from the mean water level in the harbour. The mean water level in the harbour is undoubtedly higher than the mean sea level.

By establishing an additional tide gauge in Hudson Bay an effort is being made to determine the amount of this difference. The closure of six-tenths of a foot will in all probability be reduced still further when this relation is ascertained.

Along the last 100 miles of the line the ground is perpetually frozen under a top layer of moss about one foot in thickness. There were no permanent structures for bench marks along this section, other than the railway water tanks and, had there been, the effects of the frost would have rendered them unsuitable for bench marks. For this reason a special type of re-enforced concrete pier was built, with an enlarged base, dynamite being used for the excavation of the hole in the frozen ground. It is hoped that these piers will remain permanently frozen in and will maintain their elevations. A certain proportion of the standard iron pipe bench marks were also used, as well as the foundations of the railway water tanks.

The Ontario work was done at the request and expense of the Department of Public Works and consisted in the establishment of a complete system of precise level bench marks along the water fronts of Port Arthur and Fort William. The two municipal corporations concerned each took advantage of the presence of the party to have control bench marks established at designated points in its city. The fact that a precise level line had been carried through here many years ago enabled the work to be placed at once on Canadian Geodetic datum. Thirty-nine standard bench marks were established and 21 triangulation points and Public Works bench marks were tied in to the level system.

Inspection of Bench Marks

The re-inspection of precise level bench marks in the Province of Ontario south of Ottawa, Algonquin Park, and Parry Sound which had been started in 1938 was carried to completion during 1939. This inspection included some 1,170 bench marks, of which 6¼ per cent were found to have been destroyed since the last inspection in 1925-27. The descriptions of all bench marks were carefully checked and in many cases revised in order to take account of changes since the last inspection. The conclusion of this work has enabled a revised edition of Precise Level publication No. 19 to be prepared; this will replace the original edition which is now out of print.

The following publications were printed: No. 62 "Bench Marks in Quebec, South of the St. Lawrence River"; No. 63 "Bench Marks in Quebec, North of the St. Lawrence River"; No. 44 "Altitudes in Southwestern Ontario"; No. 19 "Precise Levelling in Ontario, South of Parry Sound".

Detailed Statement of Precise Levelling run in 1939

—	Miles	Bench Marks
Kettle Rapids to Churchill, Manitoba	190	43
Port Arthur and Fort William, Ontario		39
Total	190	82

Summary

—	Miles	Bench Marks
Precise Levelling—		
Prior to 1939	26,194	9,296
1939	190	82
Total	26,384	9,378
Secondary Levelling—		
Prior to 1939	12,102	4,314

Total Mileage of Levelling by Provinces, 1939

—	Precise	Secondary	Public Works	Total
Nova Scotia	729	.....	309	1,038
New Brunswick	1,096	.....	403	1,499
Quebec	3,418	1,288	2,231	6,937
Ontario	6,956	1,324	2,012	10,292
Manitoba	2,963	368	158	3,489
Saskatchewan	4,113	5,098	.....	9,211
Alberta	2,866	3,799	.....	6,665
British Columbia	3,690	225	.....	3,915
Yukon	458	.....	.....	458
Minnesota	89	.....	.....	89
Vermont	6	.....	.....	6
	26,384	12,102	5,113	43,599

GEODETIC ASTRONOMY AND ISOSTASY

Field work consisted in determining the astronomical latitudes and longitudes at fifteen geodetic triangulation points in the Ontario, Quebec, and New Brunswick nets. These stations are as follows: Pakenham Roman Catholic Church, Renfrew United Church, Petawawa, Stonecliffe, Appleby, Springer, Nipissing, and Sheguiandah in the Province of Ontario; Shawville United Church, Grandes Bergeronnes Roman Catholic Church, St. Louis Roman Catholic Church (Coudres Island), Beaupre (Pier A), and Orleans (Island of Orleans) in the Province of Quebec; and Bartibog and Point au Sapine in the Province of New Brunswick. These observations were made for the purpose of obtaining the deflection of the vertical at the several stations. There is now available the value of the deflection of the vertical at 235 geodetic stations in Canada.

Isostasy

The office work consisted in the reduction of the field observations referred to above, and in the further investigation of the problem of isostasy. The geoid gradually rises as the investigation is extended eastward and at Sydney, Nova Scotia, it has an elevation of nearly 17 metres. The 12-metre contour line parallels the coast of New Brunswick and the east end of the Gaspe Peninsula. Following the St. Lawrence Basin toward the west it is found that elevation of the geoid gradually decreases to 5 metres at Montreal.

TRIANGULATION ADJUSTMENTS

The work of this Division is a continuation of the extensive adjustments imposed upon this Service's triangulation structure owing to the entire revision of the United States system. Published values exist for the regions of Eastern Canada which were based upon the North American Datum values of stations near the International Boundary and to which the Canadian system was attached. The newer values now being obtained for Eastern Canada are desirable for two reasons; namely, a greater accuracy is obtained, and a needed correlation is possible between the stations of the Geodetic Service, United States Coast and Geodetic Survey, and the International Boundary Survey in the same or contiguous areas.

LEVELLING ADJUSTMENTS

A line from Kettle Rapids to Churchill, a distance of 180 miles, was adjusted to the published elevations of existing bench marks. A new adjustment of recent precise levelling, of which preliminary values have been issued, has been commenced.

GEODETIC RESEARCH

The chief subject of study has been that of the dimensions and shape of the earth. Realizing the importance of more extensive data, the International Union of Geodesy and Geophysics passed a resolution, the object of which was to link together in one continuous chain, triangulation extending over three continents, the triangulation of Canada being one of the links in this extensive chain. When completed, this chain will furnish data which will be of the greatest value in the further study of the problem.

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 Commissioners held a conference in Ottawa, May 9, 10 and 11, at which details of the program of field work for 1939 were discussed and agreed upon. Further discussions were held by the Commissioners in New York on September 14 to 16, and in Ottawa on January 23, 1940.

Inspection

The Commissioners left Ottawa on July 8 and separated at Niagara Falls on August 11. During their trip of inspection, maintenance parties were visited on St. Francis River, on the Quebec-Maine boundary near Estcourt, in the Halls Stream Valley, on the Quebec-Vermont boundary westward to Beebe, Quebec, and on the St. Lawrence River between Cornwall and Morrisburg. Farther westward the inspection covered Niagara, Detroit, and St. Marys Rivers, and the mouth of Pigeon River.

Maintenance of the Boundary

A survey party of the Canadian section of the Commission carried on maintenance operations on St. Francis River and St. John River. The work done on these rivers consisted of the inspection of reference monuments and stations of the secondary triangulation, the repairing of old monuments, and the erection of new monuments. In addition plane-table surveys were made in the vicinity of the new monuments or where the rivers had obviously changed their courses since the original survey by the Commission in 1910 and 1911.

Starting at Estcourt, another survey party of the Canadian section of the Commission recleared the vista southerly on the Quebec-Maine boundary for a distance of 18 miles. In many places it was necessary to cut large trees 20 feet from each side of the centre of the line to give a clear 20-foot vista. In addition 2 monuments were repaired.

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 on St. Lawrence River.

Work was begun near Aultsville where it was discontinued in 1938, and was continued up the river to a point about 6 miles above Brockville. Where recovery of the original stations could not be made new stations were established in order to make a complete system of triangulation. Wherever United States Lake Survey stations were so situated that they could be conveniently incorporated in the triangulation this was done. In addition the triangulation was connected with two Geodetic Service of Canada primary triangulation stations in the vicinity of Brockville. Each reference monument was tied into the triangulation and made intervisible with another monument, or at least with one marked triangulation station. Most of the recovered stations and the new stations were marked with standard International Boundary Commission bronze triangulation discs.

The top of the reference monument on the ferry approach at Ogdensburg, N.Y., which had been the cause of some damage to motor cars, was cut off and replaced by an International Boundary Commission bronze tablet set in concrete at ground level.

At Niagara-on-the-Lake the reference monument which had been temporarily removed in the autumn of 1938 at the request of the Niagara Parks Commission, was replaced at its former site, but, owing to alterations made by the Parks Commission, at a much lower elevation.

The text of the Commissioners' Thirteenth Annual Joint Report for the calendar year 1938, required under the Treaty of 1925, was prepared. Further progress was made in the preparation of material for a joint report upon the survey and demarcation of the section of the International Boundary between Cape Muzon and Mount St. Elias.

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

The Hydrographic Service continued to serve the needs of the Navy, mercantile marine, and shipping interests to the full extent of facilities provided. Owing largely to war demands, the calls for charts and other hydrographic publications exceeded those of any other year in the history of this Service. Hydrographic operations and the navigational aids produced by this Service were required in many phases of naval defence. Shortly after the outbreak of hostilities in September, 1939, two hydrographic vessels in eastern waters were transferred to the Navy, and, for the remainder of the season, it was necessary for the personnel of these units to conduct operations by means of small craft, the area of charting being restricted to inshore waters.

The main charting program, which was a continuation of that of the previous season, consisted of hydrographic operations on the Atlantic and Pacific seaboards, in the Gulf and River St. Lawrence, the Great Lakes, and Lake Nipigon. Subsequent to the outbreak of war, several charting units were engaged in work directly connected with defence measures and, after the close of the regular charting season they continued to conduct operations at strategic points.

The geographic organization of the Hydrographic Service consists of the Hydrographic Headquarters at Ottawa and a District Hydrographic Office at Victoria. The administration of the various divisions comprising the Hydrographic Service is conducted from the Hydrographic Office, Ottawa, which also serves as a clearing centre for general navigational information. From here, also, is carried out the planning of new and special charting, investigation, and research in hydrographic and navigational subjects, and the dissemination of special navigational information pertaining chiefly to depths, water-levels, tides, recommended navigation routes, ice data, berthing accommodation, and harbour facilities. The Victoria Office facilitates the conducting of general hydrographic operations on the Pacific Coast and acts as a main distributing centre for charts and other hydrographic publications.

Exchange of Hydrographic Data.—As in past years several other Government Departments participated in the interchange of information pertaining to the navigation of Canadian waters. In particular, a great deal of material affecting our nautical charts and volumes of Pilots and Sailing Directions was received from the Departments of Public Works and Transport. Reciprocating, the Hydrographic Service supplied 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 new charts, through the medium of the official Notices to Mariners, published by the Department of Transport. On various occasions the facilities of this Service were extended for the calibration of radio-aids.

Many new charts and publications were received from the British Admiralty Hydrographic Department, the United States Hydrographic Office, and the United States Coast and Geodetic Survey at Washington, the United States Lake Survey Office at Detroit, and the International Hydrographic Bureau at Monaco. Extensive portions of Canadian coastal waters are covered only by original Admiralty charts, and for the correction of these, information was supplied from time to time to the Admiralty.

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 the 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 navigator. Constant revision of these volumes is necessitated 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.

Emergency Surveys.—Much special work was undertaken for the Navy, Army, and Air Force. Emergency surveys and field investigations were made in connection with reported dangers to shipping and with changes in aids to navigation. This work is always urgent and frequently of vital importance.

HYDROGRAPHY

ATLANTIC COAST AND INLAND WATERS

Gulf of St. Lawrence—Atlantic Coast.—The main work of the hydrographic steamer *Acadia* was the charting of the northeastern arm of the Gulf of St. Lawrence on the Transatlantic-Belle Isle Route, including harbours and anchorages on the west coast of Newfoundland. The ship commissioned at Halifax, and left that port on May 24, bound for Cap Rich, Newfoundland. Extensive charting operations were immediately taken in hand and, by July 26, the North Shore triangulation was extended from Flower Island light along the Newfoundland Coast to St. George Bay, where it was tied into geodetic stations.

Upon completion of the triangulation, the rest of the season in the gulf was devoted to ship-sounding, examinations of shoals, and general inspection of Admiralty charts. In addition to this main work, the ship calibrated the important radio direction-finding stations of St. Paul and Belle Isle. On September 13 the *Acadia* was ordered to terminate charting operations and to proceed to Mahone Bay, Nova Scotia. The vessel arrived at that port on September 23, and landed a shore party with boats and equipment to chart the vicinity. The ship then returned to Halifax.

While the charting of Mahone Bay was in progress small detached parties undertook special hydrographic work for the Navy, at Halifax, Bedford Basin, and Sydney Harbour. The Saint John Harbour chart was also checked up. On December 18, the Mahone Bay survey party terminated operations and the hydrographers returned to Ottawa to prepare fair sheets of the season's work.

Summary of Season's Work

Ship sounding	1,076 linear miles
Boat sounding	100 " "
Shoals examined	36

Gulf of St. Lawrence-Cape Breton.—The hydrographic steamer *Cartier* fitted out at Charlottetown and Pictou, and on May 26 cleared the latter port for the southeast coast of Cape Breton Island. The following day charting operations were started on the stretch of coast from Flint Island to Green Island. This low, rock-bound coast is bordered with several dangerous reefs, and, in places, irregular soundings extend 20 miles seaward. The best chart, on the small scale of 4 miles to 1 inch, is the result of hydrographic surveys effected as early as 1847 and 1861. This old chart is incomplete and, therefore, inadequate to serve present-day needs of navigation. The charting in hand is to replace this obsolete sheet by a set of modern charts drawn to the scale of 1 mile to 1 inch.

During the season a portion of St. Patrick Channel, Bras d'Or Lakes, was charted in order to facilitate the passage of larger ships. A large-scale recharting of Liverpool Harbour, Nova Scotia, was also undertaken.

The work on the Atlantic Coast of Cape Breton ceased on September 10, and the ship proceeded to Shediac Harbour, New Brunswick. Here, a shore-party was landed to undertake a recharting of this important harbour. On September 15, the ship returned to Halifax. On September 30, the charting of Shediac Harbour was completed, the boats were sailed to Charlottetown for laying-up and on October 16 the crew was paid off.

As a result of the season's work the following charts will be published: "MacIver Point to Little Narrows", "Liverpool Harbour", Shediac Harbour".

Summary of Season's Work

Ship sounding	922 linear miles
Boat sounding	551 " "
Shoals examined	88

Lower St. Lawrence River.—The hydrographic launch *Henry Hudson* again fitted out at Quebec and on May 23 continued the recharting of Quebec Harbour, which had been under way in the previous season. A new Admiralty type echo-sounding instrument, which registers some 600 soundings per minute, was installed in the launch. With this instrument accurate soundings are obtained 18 inches apart when the boat is travelling at full speed. During the season, in addition to completing the charting for the Quebec Harbour chart, the recharting of the St. Lawrence above Quebec was carried as far as Cap Rouge and a large-scale plan was made of the entrance to Chaudiere River to facilitate the loading of pulpwood. During spring tides a few days were devoted to charting the rates and directions of the strong tidal currents of Quebec Harbour. The work terminated on October 25.

As a result of the season's operations the following charts and plans will be available: "Quebec Harbour", "Entrance to Chaudiere River", "Approaches to Champlain Drydock", and corrections to the chart "Grosse Isle to Quebec".

Summary of Season's Work

Boat sounding	277 linear miles
Coastlining	8 " "
Shoals examined	7

St. Lawrence River.—The hydrographic launch *Boulton*, which wintered at Prescott, Ontario, left that port on May 20, and proceeded to Montreal where she continued the charting of the harbour. The last complete survey of this important area was made in 1906 and, in the intervening years numerous improvements, such as the deepening and widening of the main ship-channel, the construction of new wharves, and changes in aids to navigation, have taken place. These changes had been incorporated in the existing chart from information received from various sources from time to time. The available data, however, were incomplete, and beyond the fact that navigation off the main ship-channels was considered extremely hazardous owing to the existence of uncharted shoals, little was known of actual depths, or the channels off the dredged portions of the river.

As a result of the hydrographic work conducted during the season, the harbour has now been thoroughly charted and the new edition of the chart will contribute to the safety and convenience of navigation.

During the season an examination was also made of the harbour approaches and waterfront at Sorel. On the completion of this work the *Boulton*, by means of her modern echo-sounding instrument, sounded the centre-line of the channel of the Richelieu River from Sorel to the International Boundary near Lake Champlain. Existing aids to navigation were checked and the information obtained was incorporated in new editions of the charts of this river.

The season's work at Montreal terminated on October 16, and the launch returned to her base at Prescott. As a result of the hydrographic operations conducted a complete new edition of the chart "Montreal Harbour" will be published.

Summary of Season's Work

Boat sounding	160 linear miles
Coastlining	32 " "
Shoals examined	23

Georgian Bay Survey.—Accurate navigation charts of the Midland-Thirty Thousand Islands section of Georgian Bay are required to meet the needs of shipping which, annually, is increasing in volume. In this connection a small hydrographic party had conducted charting operations in the vicinity for the past three seasons. In the year under review, hydrographic field work, which commenced on May 26, embraced an area which included Waubaushene to

Honey Harbour and Penetang and also covered the approaches and inside passages leading to the popular Trent canal. The latter picturesque waterway is visited annually by great numbers of yachtsmen and tourists and accurate charts are in great demand. The season's charting terminated on October 21.

As a result of the work full information was obtained to complete the chart "Port Severn to Present Island".

Summary of Season's Work

Boat sounding	392 linear miles
Coastlining	58 " "
Shoals and rocks located	793

Lake Nipigon.—A new district in the field of charting was Lake Nipigon. This lake is studded with islands, uncharted rocks, and shoals. Heretofore small fishing craft constituted the principal navigation on the lake, but developments in the pulpwood industry now necessitate the use of diesel tugs for towing rafts of pulpwood. Before these large tugs could navigate with any degree of safety certain areas of the lake required to be accurately charted. This work was undertaken on a co-operative basis, the Hydrographic Service supplying two hydrographers and the Abitibi Power and Paper Company, Limited, the boats, crews, and equipment.

In order to take advantage of the level ice expanse of the lake for measuring a base-line from which to start charting operations, a hydrographer conducted this important preliminary work and some triangulation from March 7 to 20, 1939. Main charting operations commenced on June 1, and during the season the following four areas on the east side of the lake were thoroughly charted: Orient Bay, Humbolt Bay, Ombabika Bay, and Virgin Islands. In addition to the above, several lines of soundings were taken between the Virgin Islands and Ombabika Bay. The work was brought to a close on September 26.

As a result of the work the following charts were published: "Humbolt Bay", "Plans in Lake Nipigon" (Virgin Islands and Ombabika Bay, south portion).

Summary of Season's Work

Boat sounding	909 linear miles
Coastlining	28 " "

PACIFIC COAST

The hydrographic steamer *Wm. J. Stewart* was commissioned at Victoria on April 18, and devoted several days to obtaining special hydrographic information in that vicinity for the Department of National Defence.

On the 21st the ship, with the hydrographic houseboat *Pender* in tow, proceeded to Bowen Island, Howe Sound. From April 22 to May 26, charting operations were carried on in the Strait of Georgia, from Point Roberts to Sisters Island light. From June 1 to 3, the sounding of Kelp Bay, Comox, was completed and tidal survey camps were then placed at Baronet Passage and Drainey Inlet, Rivers Inlet.

From June 8 to July 4, large scale charting operations were conducted off the north end of Vancouver Island and the Scott Islands. During the following fortnight, work was carried on from Milbanke Sound to Goose Island, the ship then completing the ship-sounding at Scott Islands. Hydrographic work was undertaken in the vicinity of Goose Island from July 31 to September 2, and in the Strait of Georgia from Ballenas Island to Cape Lazo from September 8 to November 14.

The following days the *Pender* was taken to Pender Harbour and on the way to Victoria a launch party and two hydrographers were left at Point Atkinson to conduct special hydrographic work for the Department of National Defence at Lions Gate bridge, Burrard Inlet. On November 16, the *Stewart* returned to the home port of Victoria for the winter months.

Summary of Season's Work

Ship soundings	1,560 linear miles
Boat sounding	2,076 " "
Coastlining	184 " "
Shoals examined or swept	459

Hydrographic Houseboat Pender.—This craft was commissioned at Victoria on April 18, and until the 21st was engaged in the examination of eleven shoals in Victoria Harbour, the work being conducted by means of a wire sweep. From the latter date until June 4, charting operations were carried on in Howe Sound for the production of a modern chart of that important area.

From June 7 to September 3, the charting of Hunter Channel, Raymond Passage, and adjacent waters was carried on. From September 8 to 21, the houseboat completed the survey of Howe Sound and during the rest of the season conducted charting operations at Flat Top Island and in Malaspina Strait. On November 16, the *Pender* arrived in Victoria where she was laid up for the season.

Summary of Season's Work

Boat sounding	1,526 linear miles
Coastlining	453 " "
Shoals examined or swept	340

TIDES AND CURRENTS

This division is responsible for the investigation and analysis of tides and tidal action, and the compilation of the resultant data for public use. This information is published in various forms such as tide-prediction tables, special tidal-current charts, and comprehensive tidal references on standard navigation charts.

The preparation of the various editions of the Tide Tables for 1940 was completed in the early part of the fiscal year, and considerable progress was made on the manuscript for the 1941 tables. Two complete editions, one for the Atlantic Coast and the other for the Pacific Coast, are required by the shipping industry generally. Besides these, there are six abridged pocket editions to serve the needs of fishermen and others locally—four are for the Atlantic Coast region and two for the Pacific Coast. They are classified as follows:—

Atlantic Coast Tide Tables.—Atlantic Coast (complete edition). The abridged editions are for Quebec and Father Point; Charlottetown and Strait of Canso; Halifax and Sydney; and Saint John and the Bay of Fundy.

Pacific Coast Tide Tables.—Pacific Coast (complete edition). The abridged editions are for Vancouver and Sand Heads; 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 bureaux are supplied with a free copy 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, Caulfields, Victoria, Clayoquot, and Prince Rupert, B.C.

The principal tidal station at Harrington was established during the year. Because of the fact that the actual times and heights of tides in the northeast portion of the Gulf of St. Lawrence do not correspond well with predictions established with reference to distant tidal stations, the necessity for a local reference port has long been recognized. With the growing importance of the route along the North Shore from Anticosti to Belle Isle, it was felt that the necessary preparations for accurate predictions to be published in the official Tide Tables should not be longer delayed. The establishment of this station is also a primary step required for investigations of the tidal streams in this region, including the time of slack water in the channels and passages between islands. The determination of mean sea level will be of special interest as regards the question of the apparent rising of this coast.

No seasonal tidal stations were established during the year, but gauges were loaned to hydrographic parties for use in connection with their charting operations.

Investigation of Tidal Currents.—The Atlas of Currents in the St. Lawrence Estuary, recently devised and published by this Service, has met with good response from shipping interests and further investigations have been asked for.

Tidal information in the volume, Sailing Directions for the Hudson Bay Route, was revised. Since the previous edition was issued, new data regarding the turn of the tidal streams off Resolution and Nottingham Islands were obtained by radio-station officials from observations of ice movement during three winter seasons. It was also arranged with the Department of Transport to have Captain W. J. Balcom of the C.G.S. *N. B. McLean* make a float survey of the currents in Digges Sound.

Information Service.—Tidal data were furnished to engineers, scientific societies, colleges, and to other Government Departments.

Precise Water Levels

This division is responsible for the continuous precise recording of water level fluctuations on navigable waterways. The St. Lawrence-Great Lakes system constitutes a main physical feature of great importance in the economic life of Canada, and in consequence, the rise and fall of its waters constitute information of vital interest. Quebec is the geographical point of connection between the salt-water and fresh-water spheres of water-level gauging operations conducted by the Hydrographic Service. Seaward from there the work of the Tidal Current Division spreads to the Gulf of St. Lawrence, Hudson Bay, along the Atlantic seaboard, into the Bay of Fundy and also embraces the Pacific Coast of Canada. Inland from Quebec the Precise Water Levels Division takes hold, and operates a network of gauging stations up the St. Lawrence and throughout the Great Lakes to the head of Lake Superior.

Because of the importance of available depths to the loading capacity of ships on the St. Lawrence-Great Lakes System, the trends of water-levels are closely watched by shipping and other interests. For this reason the monthly "Bulletins" issued by this Division are published by many periodicals.

From the 521 months of continuous recordings in the field, over 600,000 water surface elevations were computed, collated, and compiled into comprehensive tabulations. A total of 25,461 sheets of bulletins, profiles, and data, were issued during the year. Twelve monthly, 5 annual, 6 general data, and 5 graphic bulletins were also issued.

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. During the year 78 charts, maps, prints and correction-patches were printed. These consisted of the following: 14 charts published from engraved plates in full colours; 27 charts published by photo-lithography in full colours; 19 charts published by photo-lithography in black only; 12 charts published as process prints; 3 patches for chart correction, and 2 wall maps and one secret map of Naval Intelligence Service.

List of Nautical Charts Issued 1939-40

Province	No.	Title	Scale, Inches to Nautical Mile	Remarks
Que.	3	Ile a l'Aigle to Ile Marie	6·0	Reprint
"	21	Quebec Harbour	6·0	New
"	25	Richelieu River, River St. Lawrence to Beloeil Bridge	2·5	Reprint
"	26	Richelieu River, Chambly Basin to Lake Champlain	2·5	"
"	50	Lake St. Louis	3·0	"
Ont.	64	Kingston to False Ducks	1·2	"
"	67	Hamilton Harbour	4·1	"
"	86	Georgian Bay to Clapperton Island	0·8	"
		Killarney Harbour	3·0	
"	87	Clapperton Island to Meldrum Point	1·0	"
		Serpent Harbour	2·0	
		Little Detroit	8·0	
"	89	Giants Tomb Island to Lone Rock	1·5	"
"	93	Byng Inlet and approaches	6·0	"
"	95	Meldrum Point to St. Joseph Island	1·0	"
"	98	Cove Island to Duck Islands	0·8	"
		South Baymouth	6·0	
"	118	Heron Bay	6·0	New
Que.	202	Saguenay River, Bay of Trinite to St. Fulgence	2·0	"
		Ha! Ha! Bay	3·0	
"	203	Saguenay River, Tadoussac to Baie Trinite	2·0	"
		Approaches to Saguenay River	2·0	
"	216	Anticosti Island (Southwest Point) to Cape Magdalen	0·4	Reprint
"	220	Baie Comeau	3·0	New
		Baie Comeau Wharf	6·0	
B.C.	306	Skidegate Inlet	1·0	Reprint
		Skidegate Channel, East Narrows	6·0	
		Skidegate Channel, East and West Narrows	3·0	
		Queen Charlotte City	6·0	
		Alliford Bay	4·0	
"	328	Milbanke Sound and approaches	1·0	"
		St. John Harbour	3·0	
		Channels east of Milbanke Sound	4·0	
"	330	Fraser River, sheet 2 (Steveston to Deas Island)	6·0	"
"	333	Vancouver Harbour, sheet 2 (Point Grey to Second Narrows)	3·8	"
"	349	Race Rocks to Turn Point	1·0	"
"	350	Turn Point to Sand Heads Lightship	1·0	"
"	354	Tasu Sound to Port Louis	0·5	"
"	366	Esteban Point to Cape Cook	0·5	New
"	367	Kyuquot Sound to Klaskish Inlet	1·0	"
"	369	Skidegate Channel to Tian Rock	1·0	"

Province	No.	Title	Scale, Inches to Nautical Mile	Remarks
B.C.	370	Plans in vicinity of Moresby Island Cumshewa Inlet	1·0	
		Lockeport and approaches	3·0	
		Lockeport	15·0	
		Atli Inlet and approaches	1·0	
		Takelley Cove	6·0	
"	371	Plans in vicinity of Johnstone Strait		New
		Chatham Channel	6·0	
		Beaver Cove	6·0	
		Port Neville	6·0	
		Mayne Passage	2·0	
"	372	Plans of Cowichan Bay and Port Mellon		New
		Cowichan Bay	4·0	
		Port Mellon	4·0	
"	373	Malaspina Inlet	6·0	"
"	374	Plans in vicinity of Prince Rupert		"
		Nass Bay	6·0	
		Baker Inlet	6·0	
		Entrance to Portland Inlet	2·0	
"	375	Plans in vicinity of Queen Charlotte Sound		"
		Allison Harbour and approaches	6·0	
		Hakai Passage	2·0	
		Margaret Bay	4·0	
"	378	Rivers Inlet	2·0	"
		Nelson Narrows	3·0	
"	380	Brooks Bay	1·9	"
"	381	Nanaimo Harbour	12·0	"
"	383	Checleset Bay	2·0	"
"	384	Baronet Passage and Clio Channel	2·6	"
"	387	Channels in vicinity of Yorke Island	2·8	"
"	392	Goose Islands	2·0	"
N.S.	417	Liscomb Island to Egg Island	0·7	Reprint
N.B.	419	Saint John Harbour	6·0	"
N.S.	422	Yarmouth Harbour	6·0	"
		Yarmouth Inner Harbour	12·0	
P.E.I.	460	Charlottetown Harbour	6·0	"
N.S.	467	Flint Island to Cape Smoky	1·0	New
"	468	St. Anns Harbour	4·0	"
Que.	469	Flat Island to Little Mecatina Island	1·0	"
"	470	Bradore Bay	2·0	"
"	471	Salmon Bay to Lobster Bay	2·0	"
"	472	Lobster Bay to Outer Island	2·0	"
"	473	Outer Island to Bun Island	2·0	"
"	474	Bun Island to Mutton Bay	2·0	"
N.S.	476	Louisburg Harbour	7·5	"
"	477	Mainadieu Passage	4·0	"
Que.	P1004	Mutton Bay	6·0	Reprint
"	P1027	Sorel Harbour	15·0	"
"	P1221	Approaches to Laval Bay	12·0	"
Ont.	P1502	James Bay	0·14	"
"	P2065	Toronto Harbour	6·0	"
"	P2080	Port Colborne Harbour	12·0	"
"	P2081	Plans of harbours, Lake Erie		"
		Entrance to Rondeau Harbour	15·1	
		Port Stanley Harbour	15·0	
		Port Burwell Harbour	15·1	
N.W.T.	P2170	Slave River to Mackenzie River	0·33	"
		Entrance to Mackenzie River	1·5	
"	P2171	Plans of harbours		"
		Hay River	12·0	
		Presqui'Ile Cove	12·0	
		Ile du Mort	12·0	
		Breynat Bight	12·0	
		Dawson Bay	12·0	
		Buffalo River	12·0	
"	P2172	Tuktoyaktuk Harbour (Port Brabant)	12·0	"
"	P2173	Approaches to Tuktoyaktuk Harbour (Port Brabant)	1·0	"
"	P2174	Approaches to Tuktoyaktuk Harbour (Port Brabant)	0·5	"
B.C.	P3228	Lawn Point to Selwyn Inlet	1·0	"
"	P3329	Fraser River, sheet 1	6·0	"
		Customs Act Map No. 4		New
		Route map, Gulf of St. Lawrence		"
		Ice Track chart, Gulf of St. Lawrence		Reprint

Distribution of Nautical Publications

The number of Canadian nautical charts distributed in the calendar year 1939 was again the highest in the history of this Service. The following table shows the increasing demand for these navigational aids since the year 1933:—

1933	1934	1935	1936	1937	1938	1939
8,470	9,236	10,228	12,883	14,006	17,999	19,850

Nautical publications distributed during the year were as follows:—

Catalogue of Charts, Sailing Directions, and Tidal Information with Index Maps	701
Navigational Charts	19,850
Pilots and Sailing Directions	953
Tide Tables	
Water-levels Bulletins, graphs	25,461

There are now available for issue to the public 496 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	144
Pacific Coast (including Vancouver Island)	136
Charts for special purposes	9

There were 73,929 copies of charts in stock at the Hydrographic Office on January 1, 1940. 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.; Quebec, St. Jean, and Montreal, P.Q.; Kingston, Toronto, Port Colborne, 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 City, N.Y.

MAP SERVICE

Legal Surveys

This division acts as a central surveys organization for the carrying out of legal surveys required by other Government Services. Many of the records of surveys made under the Dominion Lands Surveys System and the survey records of the 2,191 Indian reserves in Canada, as well as those of the National Parks and Settlement lots on Dominion lands are deposited in this Division. Certain members of the staff are qualified Dominion and Provincial land surveyors and, as far as practicable, their services are utilized in carrying out surveys required by the several Departments of the Dominion Government when requested to do so. During the year surveys were made for this Department and for the Department of Transport.

Field Work.—The Quartz Mining Regulations and the Yukon Quartz Mining Act provide that all plans and field notes in connection with mining claim surveys in the Northwest and Yukon Territories must be submitted to the Surveyor General for examination. In certain cases special instructions are issued for the survey of mining claims on Dominion lands. During the year instructions were issued for the survey of 46 mineral claims. Returns of survey of 108 claims were examined, areas checked, and 35 of excessive size were dealt with under the Regulations. Six miles of the Indian River Base Line governing the location of placer mines in the Yukon were surveyed. The compilation and co-ordination of plans of mineral claims was continued and a special plan of certain claims at Great Bear Lake, Northwest Territories, was prepared.

At the request of the Indian Affairs Branch, surveys were made of disputed boundaries in the following Indian reserves in British Columbia: Oregon Jack Creek No. 2, Little Shuswap No. 1, McLean Lake No. 3, and Nicola Mameet. A new reserve was surveyed near Skidegate for the purpose of enabling the Department to acquire a slate deposit for the commercial manufacture of articles by the Indians. Fifteen townships were subdivided in the Blood Indian Reserve in Alberta as foundation for the issue of leases for oil exploration. Also sites were surveyed for 14 conservation dams for agricultural purposes. Seven were on Blood Indian Reserve and 7 on Peigan Indian Reserve. A small townsite was surveyed at Hobbema and a line of division was run between Starblanket and Little Black Bear and between Starblanket and Okanesse Indian Reserves in Saskatchewan. Portions of the Township of Rankin in Ontario were surveyed with a view to purchasing the land for Batchewana Indians. An Indian village site of 95 lots was surveyed at Christian Island in Georgian Bay for allotment to the members of the band.

A survey was made to ascertain what portion of Bear Island in Lake Timagami might be available for the Indians. A road and a water lot were surveyed at Cedar Point for the purpose of acquiring facilities for the Indians to land and find shelter, in stormy weather, when they could not readily or safely get to Christian Island. Several small drainage and road surveys or subdivisions of estates were made at Stoney Point, Walpole Island, Orford, and Mud Lake in Ontario. In Quebec the subdivision of Maniwaki Indian Reserve was extended by adding 20 farm lots. The boundary line between this Indian reserve and the Townships of Bouchette and Church was made, and approved by the Dominion and Provincial Governments.

For the Lands, Parks and Forests Branch, historic sites were surveyed at Rocky Mountain House, Alta.; Emerson, Man.; Lancaster, Ont.; St. Lin, Que.; and Sambro and Osgonish, N.S. An extension to Banff cemetery was surveyed as well as additions to Yellowknife and Hay River Settlements. A retracement and restoration of part of the survey of Fort Smith Settlement was also made.

A detailed topographical survey was made of the Royal Canadian Mounted Police property at Rockcliffe, Ont., and a plan was prepared showing every building, footpath, road, and tree, as well as contours of the surface. Certain lands and roadways were surveyed for the Ottawa Airport. The Legal Surveys Division assisted in the surveys and preparation of descriptions for title to the lands required in connection with the Gatineau Federal Park.

Surveys were made of 20 farm lots and 10 village lots in Caughnawaga Indian Reserve.

Ordnance lands were surveyed at Levis, Que. A triangulation across Jacques Cartier River at Valcartier was made for the Forest Service.

Office Work.—Plans and field notes of these several surveys were prepared, checked, and recorded. A large number of legal descriptions of land for leasing or for sale or purchase were made for several departments, as well as a number of descriptions for orders in council. Numerous memoranda of a technical nature dealing with land valuations, and land survey problems in connection with roads, railways, gravel leases, telephone lines, ordnance lands, Indian reserves, and related subjects, were prepared for branches of this Department. Many special maps were prepared to accompany correspondence or for use in this and other Departments.

Correspondence with the provinces continues to arise from surveys made by the Dominion Government before the transfer of the natural resources to the western provinces.

Computing and Electoral Maps

Magnetic Work.—During the year the records of observations for magnetic declination at 375 points extending over the whole Dominion were received from surveyors of this Service, the Bureau of Geology and Topography, the Hydrographic Service, the Geographic Section of the Department of National Defence, and from the provincial survey offices of Ontario and Manitoba. These observations were reduced and incorporated into office records of some 36,000 previous observations. The co-operation of the Dominion Observatory was continued in supplying the results of precise observations at repeat stations and in standardizing the magnetic needle of one of the survey instruments of this office. The observations taken at repeat stations made it possible to bring up to date the results of older observations.

As in previous years, diagrams were prepared showing the paths of the isogonic lines for incorporation on the 27 regular topographic and aeronautical maps. The necessary magnetic information was supplied for the 74 hydrographic charts in course of preparation by this Service during the year.

Computations.—The Astronomical Field Tables were computed. Official air distances between aeroplane landing fields were computed for the Post Office Department, to serve as a basis for their air mail contracts; this work necessitated the determination of the exact locality of the individual landing fields or terminal points of the mail flights. A total of 104 such distances were supplied during the year.

Map projections were designed and computed for the ordinary requirements of this Service and also for maps possessing special properties required for defence purposes.

Electoral District Maps.—The maps of the Federal Electoral Districts are prepared and distributed by this Division. Work was done in keeping base maps up to date with regard to changes in parish, municipality, and county boundaries so as to be in a position to deal with work incidental to the next redistribution.

The imminence of a general election produced a fairly steady demand for maps during the summer and autumn. With the dissolution of Parliament in January the preparations for taking the votes of members of the Canadian Active Service Force, both in Canada and overseas, necessitated the preparation of a large number of maps. A total of more than 16,000 maps was prepared and supplied for this purpose.

Miscellaneous.—Considerable control survey information was prepared and supplied to other Federal and Provincial Government survey offices. The loan and transfer of instruments to the National Defence Services and to other Branches of the Department were also carried out.

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 and the supplying of information relative thereto. Up to the end of the fiscal year 22,171 books and 39,612 plans had been placed on record. During the year 4,456 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 scientific publications intended only for technical officers of the Government, surveyors, engineers, and scientific organizations. During the last fiscal year there were distributed 161,793 maps and 4,647 publications. In carrying on this work 24,668 letters and requests were dealt with.

There has been a greatly increased need for maps by the Department of National Defence and by other organizations connected with war work. The most urgent demand was from the Royal Canadian Air Force for air navigation charts and since September, 1939, editions for air navigation have been given special priority over topographical editions for the general public.

Large requests for various maps for use at the military training centres have been received. This has necessitated the reprinting of a number of maps to meet these requirements.

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. From this it

will be observed that work was done for other branches of the Department, as well as for other Federal Departments. The total number of copies of maps printed was approximately 346,700, necessitating nearly 1,683,750 impressions, as many of the maps were printed in several colours.

The work performed in the photo-mechanical division included: wet plate negatives, 1,034; photolithographic plates, 622; contact prints and enlargements, 5,705; line-cuts, 12; grids, 6; vandyke prints, 2,795; blue printing, 261,120 square feet; vandyke printing, 6,221 square feet; photostat work, 7,434 sheets. Much of this work was done for other branches of the Department and for other Federal Departments.

Similarly, work was done for the whole Department in the following respects: books bound or repaired, 19; maps mounted, 480; maps dissected and mounted, 45; maps mounted with rollers, 28; binders made, 28; miscellaneous jobs, 10.

Board of Examiners for Dominion Land Surveyors

The Board of Examiners for Dominion Land Surveyors held one meeting during the year, beginning February 12 and continuing until March 13. During this meeting examinations were held at Winnipeg and Calgary.

The total number of candidates who presented themselves at the examinations was 13, of whom 11 tried the preliminary examination and 2 the final examination. Two candidates were successful at the preliminary examination, and one candidate at the final examination.

Map Compilation

The production of air navigation charts, scale 8 miles to an inch, was continued throughout the year and comprised most of the work done in the Compiling Division. Work was performed on 34 of these charts. Eighteen have already been printed and the compilation of 8 others has been completed. The remainder are at present in course of compilation. This was a big program requiring the gathering together of a large amount of information from all available sources throughout Canada.

It is very necessary for air pilots to have information regarding the relief of the territory over which they are called upon to fly. This relief is indicated on the charts by elevation or hypsometric tints and to do this it is first necessary to contour them. The task of gathering information on elevations for contouring areas where little development has taken place is one of the most difficult problems of the work.

These sheets will form part of the National Topographic map of Canada and they are published in two editions. One of these editions will be for the use of civilians and the other edition for use in air navigation. Because of the very urgent need for the air navigation edition, the completion of the civil edition is being delayed until all of the air navigation editions are available for the Royal Canadian Air Force.

Work was also done (mostly in the first part of the season) on 4 four-mile sheets, 5 two-mile sheets and 7 one-mile sheets of the National Topographic series and also on 4 maps of the Northwest Territories.

In addition to the above, 5 emergency maps on a scale of 16 miles to an inch and 1 on a scale of 8 miles to an inch were produced for the area along the Atlantic seaboard and the Gulf of St. Lawrence. This was to meet the immediate needs of the Royal Canadian Air Force at the outbreak of the war. The maps were prepared in a great hurry as an overtime job and were made by joining up existing maps and adding thereon the aids to air navigation. They were found exceedingly useful to bridge the gap until the regular air navigation charts were available.

List of Map Sheets of the National Topographic Series and of the Sectional Map Series Issued 1939-40 and in Hand on March 31, 1940

Issued 1939-40

Province	No.	Series	Name	Scale (in Miles to 1 inch)	Latitude	Longitude	Remarks
N.S.	11-K/NE.	N.T.	Cape Breton Highlands Park	2	46° 30′ to 47° 00′	60° 15′ to 61° 15′	(*b*)
N.B.	21-H/12	N.T.	Sussex	1	45° 30′ to 45° 45′	65° 30′ to 66° 00′	(*a*) reprint
	N. ½-21/SE.	N.T.	Fredericton-Moncton	8	45° 00′ to 47° 00′	64° 00′ to 68° 00′	(*a*) "
	S. ½-21/NE.						
Que.	21-L/NW.	N.T.	Quebec	2	46° 30′ to 47° 00′	71° 00′ to 72° 00′	(*a*) "
	31-K/NE.	N.T.	Tomasine	2	46° 30′ to 47° 00′	76° 00′ to 77° 00′	(*b*) "
	31-K/SE.	N.T.	Gracefield	2	46° 00′ to 46° 30′	76° 00′ to 77° 00′	(*b*) "
	12/SW.	N.T.	Anticosti Island	8	48° 00′ to 50° 00′	60° 00′ to 64° 00′	(*b*) aeronautical
	22/NE.	N.T.	Clarke City-Mingan	8	50° 00′ to 52° 00′	64° 00′ to 68° 00′	(*b*) "
Ont.	52-A/SW.	N.T.	Fort William-Port Arthur	2	48° 00′ to 48° 30′	89° 00′ to 90° 00′	(*b*)
	52-A/NW.	N.T.	Kaministikwia	2	48° 30′ to 49° 00′	89° 00′ to 90° 00′	(*b*)
	42-E	N.T.	Longlac	4	49° 00′ to 50° 00′	86° 00′ to 88° 00′	(*b*)
	52-J	N.T.	Sioux Lookout	4	50° 00′ to 51° 00′	90° 00′ to 92° 00′	(*b*) reprint
	52-K	N.T.	Lac Seul	4	50° 00′ to 51° 00′	92° 00′ to 94° 00′	(*b*) " (advance print)
	31/SE.	N.T.	Ottawa-Montreal	8	44° 00′ to 46° 00′	72° 00′ to 76° 00′	(*a*) aeronautical
	42/SE.	N.T.	Hearst-Cochrane	8	48° 00′ to 50° 00′	79° 15′ to 84° 00′	(*b*) "
	N. ½-42/SW.	N.T.	Nakina-Pagwa	8	49° 00′ to 51° 00′	84° 00′ to 88° 00′	(*b*) "
	S. ½-42/NW.						
	N. ½-52/SE.	N.T.	Sioux Lookout-Nipigon	8	49° 00′ to 51° 00′	88° 00′ to 92° 00′	(*b*) "
	S. ½-52/NE.						
	N. ½-52/SW.	N.T.	Kenora-Hudson	8	49° 00′ to 51° 00′	92° 00′ to 96° 00′	(*b*) "
	S. ½-52/NW.						
Man.	N. ½-62/SE.	N.T.	Brandon-Winnipeg	8	49° 00′ to 51° 00′	96° 00′ to 100° 00′	(*a*) "
	S. ½-62/NE.						
Sask.	74/F	N.T.	Clearwater	4	57° 00′ to 58° 00′	108° 00′ to 110° 00′	(*b*)
	74/G	N.T.	Cree Lake	4	57° 00′ to 58° 00′	106° 00′ to 108° 00′	(*b*)
	N. ½-62/SW.	N.T.	Indian Head-Brandon	8	49° 00′ to 51° 00′	100° 00′ to 104° 00′	(*a*) aeronautical
	S. ½-62/NW.						
	N. ½-72/SE.	N.T.	Swift Current-Regina	8	49° 00′ to 51° 00′	104° 00′ to 108° 00′	(*a*) "
	S. ½-72/N.E.						
	118	Sect.	Rush Lake	3	50° 23′ to 51° 06′	106° 00′ to 108° 05′	(*d*) reprint
	318	Sect.	Big River	3	53° 11′ to 53° 54′	106° 00′ to 108° 05′	(*e*) "
Alta.	N. ½-72/SW.	N.T.	Medicine Hat-Maple Creek	8	49° 00′ to 51° 00′	108° 00′ to 112° 00′	(*a*) aeronautical
	S. ½-72/NW.						
	164	Sect.	Banff	3	51° 05′ to 51° 48′	113° 59′ to 116° 07′	(*d*) reprint
	165	Sect.	Rosebud	3	51° 05′ to 51° 48′	112° 05′ to 114° 00′	(*d*) "
	416	Sect.	La Biche	3	54° 34′ to 55° 18′	109° 59′ to 112° 00′	(*f*) "

List of Map Sheets of the National Topographic Series and of the Sectional Map Series Issued 1939-40 and in Hand on March 31, 1940—Continued

Province	No.	Series	Name	Scale (in Miles to 1 inch)	Latitude	Longitude	Remarks
B.C.	92-G/3	N.T.	Vancouver South	1	49° 00′ to 49° 15′	123° 00′ to 123° 30′	(a)
	92-G/6	N.T.	Vancouver North	1	49° 15′ to 49° 30′	123° 00′ to 123° 30′	(a)
	82/SW	N.T.	Okanagan-Kootenay	8	48° 00′ to 50° 00′	116° 00′ to 120° 00′	(b) aeronautical
	92/SE	N.T.	Victoria-Vancouver	8	48° 00′ to 50° 00′	120° 00′ to 124° 00′	(b) "
N.W.T.	85/I. & J.	N.T.	YellowknifeBay	4	62° 00′ to 63° 00′	112° 00′ to 116° 00′	(b)
			In Hand March 31, 1940				
P.E.I.	11/NW	N.T.	Magdalen Is. Charlottetown.	8	46° 00′ to 48° 00′	60° 00′ to 64° 00′	(b) aeronautical
N.S.	21-H/16	N.T.	Amherst	1	45° 45′ to 46° 00′	64° 00′ to 64° 30′	(a)
	11-D	N.T.	Halifax-Sheet Harbour.	4	44° 00′ to 45° 00′	62° 00′ to 64° 00′	(b)
	11/SW	N.T.	Halifax-Louisburg.	8	44° 00′ to 46° 00′	60° 00′ to 64° 00′	(b) aeronautical.
	S. ½-21/SE. N. ½-20/NE.	N.T.	Yarmouth-Windsor.	8	43° 00′ to 45° 00′	64° 00′ to 68° 00′	(b) "
N.B.	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
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-J/NW	N.T.	Mont-Laurier	2	46° 30′ to 47° 00′	75° 00′ to 76° 00′	(a)
	31-H	N.T.	Montreal	4	45° 00′ to 46° 00′	72° 00′ to 74° 00′	(a)
	31-M	N.T.	Timiskaming	4	47° 00′ to 48° 00′	78° 00′ to 80° 00′	(b)
	12/NE	N.T.	Harrington-Belle Isle.	8	50° 00′ to 52° 00′	56° 00′ to 60° 00′	(b) aeronautical.
	12/NW	N.T.	Mingan-Cape Whittle.	8	50° 00′ to 52° 00′	60° 00′ to 64° 00′	(b) "
	21/NW	N.T.	Quebec-Edmundston.	8	46° 00′ to 48° 00′	68° 00′ to 72° 00′	(a) "
	22/SE	N.T.	Gaspe	8	48° 00′ to 50° 00′	64° 00′ to 68° 00′	(b) "
	31/NE	N.T.	Gatineau-St. Maurice.	8	46° 00′ to 48° 00′	72° 00′ to 76° 00′	(b) "
	31/NW	N.T.	Upper Ottawa River.	8	46° 00′ to 48° 00′	76° 00′ to 80° 00′	(b) "
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-J/SW	N.T.	Thessalon	2	46° 00′ to 46° 30′	83° 00′ to 84° 00′	(b)
	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) "
	52-H	N.T.	Nipigon	4	49° 00′ to 50° 00′	88° 00′ to 90° 00′	(b) "
	52-K	N.T.	Lac Seul	4	50° 00′ to 51° 00′	92° 00′ to 94° 00′	(b) "
	31/SW	N.T.	Toronto-Ottawa.	8	44° 00′ to 46° 00′	76° 00′ to 80° 00′	(a) aeronautical
	40/NE	N.T.	Toronto-Windsor.	8	42° 00′ to 44° 00′	80° 00′ to 84° 00′	(a) "
	41/SE	N.T.	Manitoulin Is.–Owen Sound.	8	44° 00′ to 46° 00′	80° 00′ to 84° 00′	(b) "
	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)

List of Map Sheets of the National Topographic Series and of the Sectional Map Series Issued 1939-40 and in Hand on March 31, 1940—Concluded

IN HAND MARCH 31, 1940—*Concluded*

Province	No.	Series	Name	Scale (in Miles to 1 inch)	Latitude	Longitude	Remarks
Man.	52-M	N.T.	Carroll Lake	4	51° 00′ to 52° 00′	94° 00′ to 96° 00′	(*b*) reprint
	62/NE	N.T.	Neepawa-Gypsumville.	8	50° 00′ to 52° 00′	96° 00′ to 100° 00′	(*b*) aeronautical
Sask.	62/NW	N.T.	Broadview-Dauphin.	8	50° 00′ to 52° 00′	100° 00′ to 104° 00′	(*b*) "
	72/NE	N.T.	Moose Jaw-Watrous.	8	50° 00′ to 52° 00′	104° 00′ to 108° 00′	(*b*) "
	72/NW	N.T.	Youngstown-Kindersley.	8	50° 00′ to 52° 00′	108° 00′ to 112° 00′	(*b*) "
	73/SE	N.T.	Saskatoon-Prince Albert.	8	52° 00′ to 54° 00′	104° 00′ to 108° 00′	(*b*) "
	73/SW	N.T.	Wainwright-Battleford.	8	52° 00′ to 54° 00′	108° 00′ to 112° 00′	(*b*) "
	117	Sect.	Red Deer Forks	3	50° 24′ to 51° 06′	108° 03′ to 110° 00′	(*f*) reprint
	119	Sect.	Regina	3	50° 23′ to 51° 06′	104° 04′ to 106° 01′	(*d*) "
	120	Sect.	Qu'Appelle	3	50° 23′ to 51° 08′	102° 00′ to 104° 06′	(*d*) "
	168	Sect.	The Elbow	3	51° 05′ to 51° 48′	105° 59′ to 108° 08′	(*d*) "
	170	Sect.	Yorkton	3	51° 07′ to 51° 48′	102° 00′ to 104° 08′	(*d*) "
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*) "
	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′	
	73-L	N.T.	Lac la Biche	4	54° 00′ to 55° 00′	110° 00′ to 112° 00′	
	82/NE	N.T.	Banff-Bassano	8	50° 00′ to 52° 00′	112° 00′ to 116° 00′	(*b*) aeronautical
	83/SE	N.T.	Red Deer-Edmonton.	8	52° 00′ to 54° 00′	112° 00′ to 116° 00′	(*b*) "
	64	Sect.	Porcupine	3	49° 41′ to 50° 24′	113° 59′ to 116° 04′	(*f*) reprint
	115	Sect.	Blackfoot	3	50° 23′ to 51° 06′	112° 04′ to 114° 00′	(*d*) "
	414	Sect.	Saulteux	3	54° 35′ to 55° 18′	114° 00′ to 116° 00′	(*e*) "
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*)
N.W.T.	75/K & L	N.T.	Fort Reliance	4	62° 00′ to 63° 00′	108° 00′ to 112° 00′	(*c*)
	85/NE. & NW.	N.T.	Rae	8	62° 00′ to 64° 00′	112° 00′ to 120° 00′	(*c*)

NOTES.—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 1939-40 and in Hand March 31, 1940

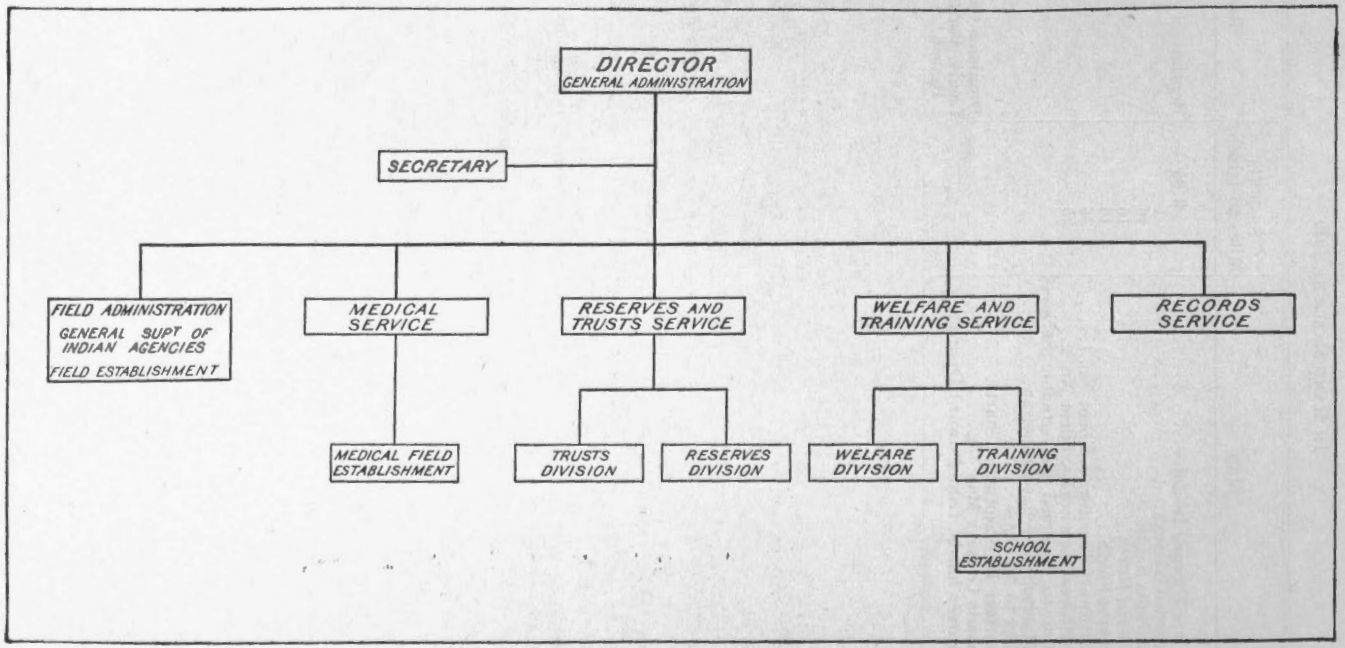
ISSUED 1939-40

Province	Map	Scale (in Miles to 1 inch)	Remarks
Que.	Tadoussac	7.89	Reprint without revision.
	Gatineau	7.89	" "
Ont.	Belleville	3.95	" "
	Cornwall	3.95	" "
	Ottawa	3.95	" "
	Parry Sound	3.95	" "
	Nipissing	7.89	" "
Sask.	Saskatchewan North	16	
N.W.T.	Northwest Territories	80	
	Great Slave Lake, Eastern and Western sheets	6	Reprint.
General	Map of World showing Trade Routes		
	Electoral Map of St. Henri		
	Index to National Topographic Series—Ontario		
	Index to National Topographic Series—Manitoba and Saskatchewan		
	Index to National Topographic Series—Alberta and British Columbia		
	Folders for maps—six plates		
	Astronomical Field Tables—two plates		
	Twenty-eight township plans	½	Reprints.
	Seventy-one Hydrographic Charts		
Miscellaneous	Proposed Highway to Alaska		British Columbia—Alaska Highway Commission.
	Two Charts		Dominion Water and Power Bureau.
	Conditions of Field Operations in Eastern and Western Canada (2 maps)		Geodetic Service.
	Yoho Park		Lands, Parks and Forests Branch.
	Jasper Park South		" " "
	Jasper Park North		" " "
	Prince Albert Park		" " "
	Riding Mountain Park		" " "
	Banff Park		" " "
	Plan of part of village lot section, Banff		" " "
	Eastern Arctic Patrol		" " "
	Management of Wood Lots 91 and 92 (Forestry)		" " "
	Sample Plots 91 and 92 (Forestry)		" " "
	Graph showing value of Christmas trees exported (Forestry)		" " "
	Pulp and Paper Industries in Canada and Newfoundland		" " "
	Coal Charts		Dominion Fuel Board
	Ottawa sheet—East and West halves		Mines and Geology Branch.
	Graticule lines for grids		" " "
	Halifax, Red Bay, Sydney, Anticosti, Saint John, and Mont Joli sheets		Royal Canadian Air Force.
	Diagrams (48 plates)		National Research Council.
	Orographical Map of Canada		Canada Year Book.
	Manitoba, Saskatchewan, and Alberta		Department of Agriculture.
	Highway to Alaska		" " "
	Province of Ontario		Department of Highways, Ontario.
	Blank township plans		Province of Saskatchewan.

List of Miscellaneous Map Sheets and Plans Issued 1939-40 and in Hand March 31, 1940—Concluded

IN HAND MARCH 31, 1940

Province	Map	Scale (in Miles to 1 inch)	Remarks
P.E.I.	Prince Edward Island	3.95	Reprint.
Quebec	Ottawa-Gatineau	1	"
Manitoba	Manitoba South	16	
Alberta	Alberta North	16	
	Alberta South	16	
N.W.T.	Northwest Territories, Sheet No. 1	35	
	Northwest Territories, Sheet No. 2	35	
General	Index to National Topographic Series—Manitoba and Saskatchewan		
	Index to Air Maps		
	Fourteen Hydrographic Charts		
Miscellaneous	Canada Gravity Map		Dominion Observatory.
	Cutover Lands, Lake Edward District		Lands, Parks and Forests Branch.



Organization Chart, Indian Affairs Branch.

INDIAN AFFAIRS BRANCH

DR. H. W. McGILL, DIRECTOR

The outbreak of war could not fail to affect in some measure the Indians of Canada. Always loyal, they were not slow to come forward with offers of assistance in both men and money. About one hundred Indians had enlisted by the end of the fiscal year and the contribution of the Indians to the Red Cross and other funds amounted to over $1,300.

During the visit of Their Majesties, the King and Queen, the Indians of Canada participated officially in the receptions at four points. Their Majesties showed keen interest in the Indian village at Port Arthur where, in native dress, the Indians presented a striking appearance. At Calgary, Indian participation took the form of a camp-site of thirty teepees and some thirty-six mounted Indians in full regalia grouped at vantage points in the camp. When Their Majesties were leaving Vancouver, twenty war canoes manned by 300 Indians formed an escort for the ship carrying the King and Queen, from the dock to the Lions Gate Bridge. On the return trip to Eastern Canada the Queen Anne Bible, the property of the Six Nations Indians, was signed by The King and Queen at the Brantford station.

Conditions among the Indians

Evidence of increasing interest in the various divisions of agriculture was noted among Indians on reserves in many parts of Canada. Although production was affected in certain provinces by adverse climatic conditions, on the whole the progress made was satisfactory and gave a clear indication of the growing utilization of suitable agricultural lands on the reserves. Improved conditions were also reported from parts of Canada where the Indians depend upon hunting and trapping for their livelihood. In most cases there was a slight increase in the number of fur bearers, and a more plentiful supply of other game animals than in the last fiscal year.

Wolves continue to affect the domestic economy of Indians in the Northwest Territories and are reported to have caused much damage to fur in the traps. Adverse weather conditions made hunting and trapping difficult in some areas. Marten are reported to be increasing and moose and caribou were plentiful. A good summer fish run enabled the Indians to put up a large quantity of dried fish.

Generally speaking, the Indians of British Columbia had a normal year and undoubtedly as time goes on they will gradually improve their economic condition. The outstanding feature marking progress during the year under review was the increased acreage under crop. Much has been done by the Branch in the promotion of agriculture in this Province by supplying farm machinery and seed, and constructing irrigation systems. Increased attention is being paid to land clearing operations. Land in the vicinity of the old village of Bella Coola was cleared and planted to potatoes, the crop being sufficient to supply the season's requirements for the village. A similar project, undertaken at the Pemberton Reserve, New Westminster Agency, produced 147 tons of potatoes in 1939. The returns from fishing have decreased in the past few years in this Province owing partly to the smaller runs of salmon in certain sections and also to the inroads of white fishermen on grounds formerly held almost exclusively by the Indians. This competition is being met to some extent by the use of larger boats and more up-to-date gear. The complete failure of the pilchard run during the 1939 season was the cause of a decrease in employment as compared with the two previous years. As was the case in the year 1913, the pilchard failed to appear on the coast. The Indians of the Stikine Agency in the northern part of the Province had a successful trapping season.

For the most part the Indians of Alberta had a satisfactory year, an indication of which is the improvement that can be reported from the Stony Reserve, considered to be the poorest and most difficult to improve in the Province. The agencies had fair crops, all of which, however, suffered to some extent from a period of hot, dry weather in July and August. This was also disastrous for potatoes, causing the poorest crop in several years. Irrigation projects initiated at the Blackfoot Agency are working satisfactorily and should materially improve conditions in the irrigated areas. The Alberta Indians have good herds of high-grade cattle. Special attention is being paid to the breeding of stock for colour as this affects sales by carloads. The beef cattle sold during the year brought top prices in the market. The introduction of better breeding stock has improved the quality of the horses owned by the Alberta Indians. There was a slight increase in fur-bearing animals and the Indians found plenty of big game for food. Additional trap-lines are being acquired for the Indians whenever these become available. Commercial fishing was not remunerative, but Indians fishing for food were well supplied.

Notwithstanding the adverse climatic conditions with which the farming Indians of Saskatchewan have had to contend, marked progress in agriculture can be reported. This improvement can be attributed largely to closer supervision. Effective personal contact with the Indians has inspired them to make a real effort towards successful farming. Community farms and gardens have played a large part in this achievement, showing the Indians the value of co-operative effort. For the season of 1939, nine new tractors, as well as horses and implements, were provided from appropriation and from band funds. In the spring of that year seventeen community farms comprising some 2,900 acres were in operation in Saskatchewan.

In many agencies in Manitoba tractors were supplied and new land was broken. On some of the reserves the aim has been to break and seed enough land to provide the Indians with sufficient flour for their own requirements and this goal has been reached. On the majority of the farming reserves the Indians harvested good crops. On Lakes Winnipeg, Manitoba, and Winnipegosis the fishing was better than in previous years and a good price was obtained for the fish. Trapping is the chief means of livelihood for many of the Indians of the northern part of the Province. The fur catch, although not plentiful, was better than for the year 1938-39, and prices were higher. The return of rabbits in large numbers has increased the food supply of the Indians.

There was a noticeable increase in agricultural activity in Ontario during the season of 1939. The Indians were encouraged and assisted by providing them with equipment and by loans to individuals for farming operations. The Caradoc Reserve at Muncey and the Six Nations at Brantford were the centres of greatest activity. At the former reserve the Indians had 3,000 acres under cultivation and their crop realized approximately $40,000. The Sarnia Indians supplied their own farming equipment and built a new granary at a cost of $3,000, the money being provided from band funds. The Indians of Tyendinaga, Manitoulin Island, and the Sault Ste. Marie Agencies also have made progress in this direction. The Batchewana Indians, who were formerly on the Garden River Reserve in the Sault Ste. Marie Agency, purchased, with their own funds, land for a reserve some 6 miles from Sault Ste. Marie where they intend to engage in agriculture. A total of 48,000 trees was supplied in the spring of 1939 for the afforestation of 36 acres on the Caradoc Reserve.

In Quebec a serious effort has been made during the past few years to interest the Indians of as many reserves as possible in farming and to impress upon them the necessity for increasing the acreage under cultivation and for making more effective use of the land already being worked. This policy has been effective at Pointe Bleue and St. Regis Agencies, where the Indians are well equipped with

implements that they have acquired themselves. Progress in agriculture is also reported on the Maniwaki, Nedelec, Restigouche, Maria, and Oka Reserves. Indians of the reserves on the north shore of the St. Lawrence River have had somewhat better results from trapping.

The authority of the Governor General in Council was obtained during the fiscal year for the establishment of an Indian agency for the northwestern portion of Quebec to be known as the Abitibi Agency. The area covered is approximately 60,000 square miles and extends east and west between the town of La Tuque and the boundary of the Province of Ontario and approximately 200 miles north and 100 miles south of the transcontinental railway line of the Canadian National Railways. The agency contains some 1,500 Indians scattered over twelve reserves. Owing to the vastness of the area and to the widespread location of the reserves it has been difficult to administer the affairs of the Indians of this district. With the appointment of an agent with headquarters at Senneterre, Que., it is expected that much closer and more effective supervision will be possible.

Conditions among the Indians of the Maritime Provinces do not vary greatly although gradual improvement is noted from year to year. The provision of tractors and other farming equipment has assisted them in their gardening and small-scale farming operations. A number of new dwellings were erected for the Indians of these provinces.

INDIAN HEALTH SERVICE

Further progress was made in Health Services. There was about the usual amount of infectious disease. In the West Coast Agency an epidemic of influenza with a high incidence of pneumonia caused 16 deaths. Deaths also occurred from influenza in the Fond du Lac area and in northern Ontario. There were sporadic outbreaks of diphtheria, scarlet fever, measles, chicken-pox, and whooping cough, but no epidemics of serious proportions developed. Investigation showed a reported outbreak of smallpox in the Chapleau Agency to be chicken-pox, and that almost every member of the band had been vaccinated during recent years.

A serious outbreak of typhoid fever occurred in the Norway House residential school. It is planned to install a chlorinator there this year. Typhoid also appeared at Gods Lake and in the Sioux Lookout Agency, and at Poormans Reserve in Saskatchewan. Wherever it occurred, steps were taken to trace the source and also to do as widespread inoculation of contacts as possible. A serious health problem among the Indians of the north is the fish tapeworm. It infects both dogs and man.

During the year, the Department acquired a residence and office for the Medical Superintendent at The Pas; a building that is being transformed into an isolation hospital for tuberculosis on Manitoulin Island; and a fifty-bed tuberculosis sanatorium near Selkirk, Man. A twenty-bed hospital and sanatorium was built at the Fisher River Agency. In the construction of this building only one white foreman was employed. The remainder of the work, including getting out logs and manufacturing all the rough lumber, was done by the Indians themselves.

The campaign aimed at the eradication of trachoma was pursued vigorously, under the direction of Dr. J. J. Wall, and included the use of sulphanilamide, a new and promising type of treatment.

Good results are being obtained in the campaign against tuberculosis; the greatest single achievement was the purchase, renovating, and equipping of the Dynevor Hospital, which is now being operated for the Department by the Sanatorium Board of Manitoba on an audited per diem cost basis. Across the country, at one time during the year, 582 Indian patients were receiving treatment in institutions. The total cost of institutional treatment for the fiscal year

was $380,115. As an example of progress, a tuberculosis survey made in Alberta may be cited. A survey of 12 Indian residential schools made in 1938 disclosed 30 active cases, whereas a re-survey the following year showed only 11 active cases.

WELFARE AND TRAINING SERVICE

TRAINING

The following table shows pupil enrolment and attendance during the past 10 years:—

Fiscal Year	Residential Schools		Day Schools		Total		
	Enrolment	Average Attendance	Enrolment	Average Attendance	Enrolment	Average Attendance	Percentage of Attendance
1930-31	7,831	6,917	8,584	5,314	16,415	12,231	74·51
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

Day schools were constructed during the year at the following reserves: Salmon River, N.S.; Eel Ground, N.B.; Maria (two-room), Que.; Metagami, Mud Lake (two-room), Six Nations, and Sucker Creek, Ont.; Little Grand Rapids, Man.; Big River, Sask.; Boothroyd, Cowichan, Gitlakdamix, and Seton Lake, B.C. Schools were established for the first time at Metagami, Ont., and at Big River (R.C.), Sask. The other schools were constructed to replace buildings that had become unsuitable for educational purposes.

The Ste. Catherine day school, Cowichan Agency, B.C., is a consolidated four-room school with full basement accommodation for vocational instruction. About 100 pupils are conveyed to this school daily by bus. If successful, schools such as this may, in time, displace a number of residential schools now operating on Indian reserves.

Residential school buildings at Carcross, Yukon; Albany, James Bay, Ont.; and Ahousaht, West Coast Agency, B.C., and the Indian day school at Hunter's Point, Timiskaming Agency, Que., were totally destroyed by fire. The boys' building at the Alert Bay residential school, Kwawkewlth Agency, B.C., was partly destroyed. It is felt that in future all residential schools should be of fireproof construction.

There is a growing realization on the part of our Indian population of the direct relationship between worth-while secondary school courses—academic and vocational—and the ability of the members of the younger generation to establish themselves on a self-supporting basis. This has led in recent years to a widespread demand for tuition grants. An arrangement has now been made whereby the first year high school course will be provided at a large number of Indian day schools. Assurances have been received from the Correspondence Branch of the Department of Education in each of the provinces concerned that they will co-operate with the Department in the promotion of these courses.

Indian day and residential schools in Prince Edward Island, Nova Scotia, Ontario, Manitoba, Saskatchewan, and Alberta are regularly inspected by public school inspectors and in New Brunswick and British Columbia, by inspectors employed by the Department. The reports received from these

officers indicate that courses of study have been adjusted to meet the peculiar temperament, outlook, and needs of the Indian pupil. They indicate also that the teachers in charge of Indian schools are, with few exceptions, fully qualified in a professional sense, are deeply interested in the welfare and progress of their pupils, and are anxious to co-operate with Indian agents and farm instructors in the organization of women's clubs, and cultivation of subsistence gardens, and in general welfare work on the reserves.

Indian Education—Expenditure for Year 1939-40

—	Day Schools	Residential Schools	General	Total
	$ cts.	$ cts.	$ cts.	$ cts.
Nova Scotia	12,570 82	29,690 14	.....	42,260 96
Prince Edward Island	905 98	.....	.....	905 98
New Brunswick	18,215 73	.....	.....	18,215 73
Quebec	58,642 52	18,905 06	.....	77,547 58
Ontario	111,732 93	292,402 37	.....	404,135 30
Manitoba	62,199 09	176,577 38	.....	238,776 47
Saskatchewan	49,056 78	294,158 20	.....	343,214 98
Alberta	1,380 94	333,202 63	.....	334,583 57
British Columbia	85,695 94	338,445 20	.....	424,141 14
British Columbia Schools Vocational Instruction	.....	.....	9,943 88	9,943 88
Northwest Territories	1,375 59	45,242 68	.....	46,618 27
Yukon	3,045 00	18,629 18	.....	21,674 18
Assistance to ex-pupils	.....	.....	2,178 99	2,178 99
Freight and express	.....	.....	1,137 54	1,137 54
Salaries and travel	.....	.....	15,949 61	15,949 61
Stationery	.....	.....	38,887 84	38,887 84
Tuition	.....	.....	34,682 36	34,682 36
Expended by Surveys and Engineering Branch for building and repairs to schools	.....	.....	276,463 00	276,463 00
Miscellaneous	.....	.....	236 23	236 23
	404,821 32	1,547,252 84	379,479 45	2,331,553 61

WELFARE

Relief and welfare costs for the year show a reduction amounting to $26,712.89 for Prince Edward Island, Ontario, Manitoba, Saskatchewan, and the Northwest Territories, and an increase amounting to $32,241.61 in Nova Scotia, New Brunswick, Quebec, Alberta, and British Columbia, or a net increase for the Dominion amounting to $5,527.72.

A steadily increasing interest in the improvement of home conditions was in evidence throughout the year. A large number of Homemakers' Clubs were organized under the direction of the Inspector of Indian Agencies for Saskatchewan and a number of somewhat similar groups were organized in the Kwawkewlth and New Westminster Agencies, British Columbia, in the Birtle and Fisher River Agencies, Manitoba, and in the Six Nations Agency, Ontario. The members of these groups meet monthly. The programs provided usually consist of worth-while projects such as knitting, dressmaking, fruit preserving, the canning of vegetables, and lectures on health, sanitation, and child care. The officers of the Provincial Extension Services have willingly responded to the requests to arrange seasonal programs and provide lecturers for these clubs.

The number of Indians seeking loans from the Revolving Fund was not so large as expected. Eighteen groups of Indians were provided with loans from this fund amounting to $35,046.91 during the calendar year 1939. With the exception of two loans amounting to approximately $7,000, secured by the Caughnawaga and Abenakis Indians of Quebec, all loans secured were used for the organization and promotion of collective farm projects in the Prairie Provinces. The largest single item of expenditure was that necessary for the

purchase and operation of tractors. Loans are authorized only after a thorough investigation of local conditions by the Indian agent and by the inspector and then only to responsible groups of Indians and in amounts not exceeding $5,000 in each case.

The following is a statement of welfare expenditures by provinces for the year 1939-40:—

Province	1939-40	1938-39	Province	1939-40	1938-39
	$ cts.	$ cts.		$ cts.	$ cts.
Nova Scotia	75,948 48	72,241 26	British Columbia	107,487 25	102,350 72
Prince Edward Island	7,534 59	8,347 63	Northwest Territories	23,823 13	26,781 45
New Brunswick	65,294 79	61,503 32	Yukon	12,453 68	9,907 02
Quebec	216,956 06	206,012 56	Triennial Clothing	3,485 08	1,717 28
Ontario	141,693 65	143,539 93	Miscellaneous	24,910 13	31,432 27
Manitoba	107,045 45	114,396 71			
Saskatchewan	102,712 56	109,934 41		984,770 44	979,242 72
Alberta	95,425 59	90,998 16			
			Net Increase		5,527 72

HANDICRAFT

Handicraft projects remain in the experimental stage and from a promotional standpoint have been confined almost wholly to the Provinces of Ontario and Quebec. Experience has shown that exhibitions and displays, coupled with practical demonstrations by skilled handicraft workers, are an important factor in stimulating interest in Indian welfare and in the sale of handicraft products. Two exhibits and demonstration centres were organized during the year. The exhibit organized at the Canadian National Exhibition, Toronto, received wide publicity and was one of the most attractive on the exhibition grounds. The display was arranged in an attractive and suitable setting provided in the courtyard of the National Industries Building. Black ash and sweet grass baskets, carved figures, bark work, beaded moccasins, and hand-wrought metal utensils, valued at $3,000, were sold. Forty Indians took part in the demonstration.

Six Indians took part in the exhibition and demonstration of handicraft work organized at Winnipeg and goods valued at $5,000 were sold during the display, which covered the period from November 25 to December 21, 1939.

Indian handicraft projects, to be successful, impose upon the Department an obligation to provide constant supervision and this obligation has until now confined efforts largely to reserves in Eastern Canada. Faulty workmanship and the failure of wholesale and retail marketing agencies to secure a continuous supply of high quality handicraft products have in the past militated against the success of the Indian in building up his reserve industries. Only by constant and capable supervision can good workmanship and continuity of supply be guaranteed to a market that has grown steadily and encouragingly since the inception of this work 3 years ago.

Grants to Agricultural Exhibitions and Indian Fairs, 1939-40

Quebec	
Canadian Handicraft Guild, Montreal	$ 50 00
Ontario	
Caradoc Fair and Ploughing Association	200 00
Garden River Agricultural Society, Sault Ste. Marie	100 00
Manitoulin Island Unceded Agricultural Society	150 00
Indian Exhibits, Toronto Exhibition	450 00
Ohsweken Agricultural Society, Brantford	200 00
Snake Island Agricultural Society, Georgina Island	50 00

Ontario—Continued	
Thunder Bay Agricultural Association, Fort William	$ 250 00
Tyendinaga Agricultural Society	100 00
Field and Garden Prizes, Standing Crop Competition	648 50
Ploughing Matches	639 65
International Handicraft Festival	50 00
Manitoba	
Garden Prizes, Birtle	14 65
Manitoba Provincial Exhibition, Brandon	250 00
Rossburn Agricultural Society, Rossburn, Man.	25 00
Saskatchewan	
Garden Prizes, Battleford	25 00
Garden Prizes, Carlton Agency Horticultural Fair	25 00
Prince Albert Agricultural Society, Prince Albert	400 00
Regina Agricultural and Industrial Exhibition Association	400 00
Alberta	
Calgary Exhibition, Calgary, Alberta	400 00
Edmonton Exhibition Association, Edmonton	400 00
Garden Prizes, Alberta	68 00
British Columbia	
Armstrong Fall Fair, Okanagan	250 00
Cowichan Agricultural Society, Duncan	50 00
North and South Saanich Agricultural Association	50 00
Windermere and District Fall Fair, Kootenay	150 00
Vancouver Fall Fair	500 00
	$ 5,895 80

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 new drive shed was purchased for the Caradoc Agency; a small shed was erected at the Sault Ste. Marie Agency; a dock, warehouse, and boat-house were built at Orient Bay, in the Port Arthur Agency.

Quebec.—Sidewalks were constructed at Restigouche.

Manitoba.—Granary at Griswold Agency; two granaries and a building to house new lighting plant at Fisher River Agency; garage and tool-house at The Pas; storehouse at Lake St. Martin, granary at Lake Manitoba, granary and pump-house at Long Plain, implement shed at Swan Lake Reserve, all in the Portage la Prairie Agency; lean-to at Farming Instructor's residence on Waywayseecappo Reserve in Birtle Agency; implement shed on Fort Alexander Reserve in the Clandeboye Agency.

Saskatchewan.—Granaries at Nut Lake and Day Star Reserves in Touchwood Agency; implement shed on Mistawasis Reserve, granaries on Muskeg Lake, Sturgeon Lake, and Sandy Lake Reserves, ration house on Big River Reserve, and warehouses at Lac la Ronge and Stanley Reserves all in Carlton Agency; implement shed and barn on Kinistino Reserve, house for Farming Instructor on John Smith's Reserve, barn at John Smith's Reserve, all in Duck Lake Agency; implement shed on Red Pheasant Reserve in Battleford Agency; ration house on Standing Buffalo Reserve in Qu'Appelle Agency; implement shed on Cold Lake Reserve, Onion Lake Agency; granary at Crooked Lake Agency.

Alberta.—Combined drive shed, implement shed, and workshop at headquarters of Edmonton Agency, also root-houses at Wabamun and Alexander Reserves in Edmonton Agency; root-houses at four reserves in Lesser Slave Lake Agency.

British Columbia.—A float was rebuilt at the Sechelt Reserve, Vancouver Agency, and a float was constructed at the Ucluelet Reserve in the West Coast Agency.

Northwest Territories.—Five storehouses were provided at the Fort Resolution Agency and 5 public latrines were built.

Roads

Roads on Indian reserves requiring attention were improved, and a new road was partially constructed through the Spanish River Reserve leading to the town of Massey, Ont. This work was carried out in co-operation with the Provincial Department of Highways. Stone was crushed during the winter and gravel was hauled and placed along the roads on the Caughnawaga and St. Regis Reserves, Que., and on the Tyendinaga Reserve, as well as on the reserves in the Caradoc Agency, Ont.

Bridges

A bridge over LaCloche Creek on the road through the Spanish River Reserve in the Sault Ste. Marie Agency, Ont., was constructed. A bridge over the Valley River Reserve in the Pelly Agency, Sask., was built in co-operation with the Provincial Department of Public Works and Labour. Materials for building a bridge over the Birdtail River in the Birtle Agency, Man., were purchased and paid for jointly by this Department and the Provincial Government. The Cedar Creek bridge on the Maniwaki Reserve, Que., and bridges on the Walpole Island and Manitoulin Island Reserves in Ontario were repaired.

Wells and Dugouts

Wells were drilled on the Ochapowace Reserve in the Crooked Lake Agency, and in the Duck Lake and Onion Lake Agencies, Sask.; on the Little Saskatchewan Reserve in the Portage la Prairie Agency, Man.; at the Kingsclear Reserve, N.B., and at the Lesser Slave Lake Agency, Alta. Dugouts were provided for stock watering purposes at the Okanese, Star Blanket, Little Black Bear, and Peepeekisis Reserves in the File Hills Agency, Sask.

Breakwater

The breakwater at McIntyre Bay Reserve in the Port Arthur Agency, Ont., was repaired and extended.

Lighting Plants

New lighting plants were provided at Restigouche and St. Regis Agencies, Que., Fisher River Agency, Man., Carlton Agency, Sask., and for the Peigan Indian Agency and Hospital, Alta., and new batteries were purchased for the lighting plant at the Qu'Appelle Agency, Sask. An electric water system was installed at the Touchwood Agency, Sask.

Miscellaneous

A new furnace was installed in the Manitoulin Island Agency residence, Ont., and in the agency building at Griswold, Man. The furnace at Morley, Alta., was repaired. All departmental boats which required attention were

repaired. Funds were transferred to the Surveys and Engineering Branch for the construction and maintenance of irrigation systems on Indian reserves in British Columbia.

Surveys

A list of reserves where surveys were made is included in the report of the Surveys and Engineering Branch.

RESERVES AND TRUSTS SERVICE

RESERVES DIVISION

Owing to the increase in Indian population noted during the past decade, further sales of Indian lands are not encouraged, save in exceptional circumstances, and then only after careful consideration has been given to the estimated future needs of the band membership.

Land Sales and Leases

During the fiscal year, 5,472 acres of land, exclusive of subdivision lots surplus to the needs of the Indians where such land was located, were sold for cash and interest bearing securities with a total value of $39,932.82. The cash payments totalling $11,282.97 were added to Indian trust funds capital account. A total of $60,409.30 on account of interest and $50,980.43 on account of principal was collected on older land sales contracts. Rentals collected from Indian lands under lease amounted to $162,524.48. There were 882 current land sales, a decrease of 18 from the previous year, and 1,629 lease accounts, an increase of 157.

Adjustments under Farmers' Creditors Arrangement Act

During the fiscal year, 24 applications for adjustment of land sale contracts were dealt with under the Farmers' Creditors Arrangement Act. Gross reductions of $77,567.32 were ordered under the Act—$70,626.36 on principal and $6,940.96 on interest in arrears.

Fur Conservation and Land Uses

The policy of the Department to develop the fur resources of Canada as a means of providing a livelihood for Indians in their traditional occupation of hunting and trapping was continued.

A gratifying increase was recorded in the number of beaver in the Nottoway River Sanctuary in northern Quebec where their protection and conservation is being looked after by Indian fur wardens selected from the band membership.

The Two Island Rehabilitation Project for muskrats in northern Manitoba has now advanced to a stage where natural forces will assure the repopulation of the area. Mechanical structures were erected during the year and the increase in rat population already recorded is satisfactory. The project is receiving the whole-hearted co-operation not only of the Indians and halfbreeds but of the whole community directly affected by the undertaking.

Much useful information was collected and tabulated on the resources of the northern portion of the Prairie Provinces in the interests of the large Indian population of those areas.

Further rat development work was carried on in the Wood Buffalo National Park to restore the species within the park and in large areas adjacent to it.

There is every indication that the program directed toward the conservation of fur-bearing animals will play a vital part in providing a self-sustaining livelihood in occupations congenial to the native population in whose interests it has been undertaken.

The policy was continued of acquiring desirable trap-lines and trapping grounds for the exclusive use of the native population of British Columbia and the eastern foothills of the Rockies.

Indian Estates

Marked progress was made in the administration of the property of deceased Indians and in straightening out the title and records of Indian lands held by individual Indians in accordance with the provisions of the Indian Act. More than 200 Indian estates received attention. This work will become increasingly important with the spread of the desire for individual right of occupancy which is becoming more evident in all bands, particularly in Eastern Canada.

Timber and Forestry

The administration of the timber resources on Indian reserves in Canada involved the sale and utilization of timber products as follows:—

	Feet Board Measure
Sold under timber licence.....approx.	35,000,000
Utilized by the Indians themselves for domestic purposes. . . ..approx.	7,000,000
Total 1939-40. . . ..approx.	42,000,000
Total 1938-39. . .....approx.	37,000,000
Increase. . . ..approx.	5,000,000

Revenues added to the capital funds of Indian bands from timber sales show a gratifying increase as follows:—

Total timber royalties 1939-40. . . ..$	76,162 63
Total timber royalties 1938-39	46,197 43
Increase: (40 per cent above 5-year average).....$	29,965 20

This increase is due to increased volume, to better prices obtained as a result of expanding markets, and to closer supervision of cutting operations. Net returns to Indian funds from timber sales show an increase from $1.71 per thousand in 1938-39 to $2.18 per thousand for the year 1939-40, or approximately 27 per cent.

Forest Protection

Fire losses on Indian reserves were extremely low and are estimated not to have exceeded 20,000 feet board measure during the year. No fire protection organization is operated by the Department, but an arrangement made with the several provinces is working out satisfactorily. The total cost of this service was $4,320.16.

Mining

A total of $1,428.15 was collected in payment of mining licences, rentals, and prospectors' fees, and $5,105.39 as royalties on the sale of sand and gravel. Very little interest was shown in Indian lands by metal mining enterprises. Small quantities of coal continued to be taken from the mine operated by the Indians on the Blackfoot Reserve.

Petroleum and Natural Gas

Interest in the oil and gas possibilities on Indian reserves in Alberta continued. The seismic survey on the Blood Reserve was completed and the operators expressed keen interest in the formations that it disclosed. There was a renewal of interest also in the Manitoulin Island area, Ontario.

Indian Enfranchisements

Enfranchisements under the provisions of the Indian Act during the year reached a total of 40, comprising 99 individuals. These figures are lower than those for the previous year.

TRUSTS DIVISION

Indian Trust Funds

The division administered some 430 trust accounts belonging to Indian bands throughout the Dominion. These trust funds on March 31, 1940, totalled $14,297,756.59. A comparison with the previous year follows:—

	Capital	Interest
Trust balances March 31, 1940	$ 12,046,835 92	$ 2,250,900 67
Trust balances March 31, 1939	11,978,309 35	2,171,153 84
Increase in trust balances	$ 68,526 57	$ 79,746 83

Total revenues and expenditures in band fund trust accounts during the year were as follows:—

Revenues	$ 1,338,639 61
Expenditures	1,190,386 21
Excess revenues over expenditures	$ 148,253 40

Below is a statement of the major items of expenditure for the fiscal years ended March 31, 1939, and March 31, 1940, illustrating the various uses to which the funds are put:—

	1939	1940
Salaries and wages	$ 61,301 79	$ 61,558 65
Building materials and repairs	19,093 76	15,484 96
Fencing	5,298 04	6,720 56
Farming operations	25,150 37	39,382 29
Farming equipment, machinery, and repairs	35,530 79	38,451 31
Live stock purchases	6,660 00	20,137 70
Operation and promotion of industries	25,215 70	29,553 84
Relief	192,906 36	191,934 11
Repairs to roads, bridges, and docks	43,876 67	44,950 00
Seed grain and feed	44,323 50	27,894 87

Distribution of Cash Income to Indians

Interest	399,061 62	396,536 47
Rentals	48,065 40	49,957 35
Land	4,758 56	9,679 85
Timber	10,315 81	11,614 00

The increase in expenditures on farming operations and the purchase of live stock indicates an increasing interest in agricultural pursuits among the Indians.

Band Loans

Efforts were continued to encourage the Indians to make greater use of their capital funds to promote the welfare and progress of band members and to

enable individuals to improve their locations by the erection and repair of buildings and fences, the sinking of wells, and the purchase of live stock and farming equipment, and to enable them to enjoy more fully the productive value of their lands. These efforts met with a ready response. During the fiscal year a total of $28,248.94 from band funds was loaned to individual band members, adequately secured by real property and chattel mortgages and by assignment of interest distributions. This sum was advanced for the purposes and in the amounts listed hereunder:

In the purchase of live stock and equipment	$ 13,419 01
Repairs to buildings, fences, etc.	5,297 93
In the purchase of property—lands and buildings	5,025 00
Construction of new buildings and wells	3,810 00
Miscellaneous purchases	697 00
Total	$ 28,248 94

In this connection the following recapitulation is of interest.

Applications considered, 231 totalling	$ 35,823 94
Applications approved, 175 totalling	28,248 94
Applications rejected, 41 totalling	5,828 00
Applications cancelled, 15 totalling	1,747 00
Average size of loan advanced to individuals	161 42

Attention was also given to the collection of recoverable advances made in former years.

Personal Savings Accounts

In addition to the general funds of the bands, the division administers 1,063 individual savings accounts, representing a total of $240,517.46.

A statement of the year's deposits and withdrawals follows:

	1939	1940
Deposits	$ 52,884 87	$ 75,306 16
Withdrawals	49,201 57	72,476 34
Net increase in funds on deposit	$ 3,683 30	$ 2,827 82

Annuities

The usual arrangement for payments of treaty annuities was made throughout the country, the total distributions being $259,894. 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.—On Lennox Island several of the Indians engage in farming on a small scale. Most of them own a few head of cattle and horses, but their main occupations are basket-making, fishing, and working around the different towns and villages, wherever they can find employment.

Dwellings.—On the whole these Indians have fairly good homes. Several new houses have been built recently.

NOVA SCOTIA

Agencies.—There are nineteen Indian agencies in Nova Scotia, namely: Yarmouth, Digby, Shelburne, Lunenburg, Annapolis, Kings, Queens, Hants County (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.—The Indians find employment in lumber camps, sawmills or as stevedores. A number work for farmers, especially in the Annapolis Valley orchards. Generous amounts of seed, potatoes, and fertilizer are supplied, but few of the Indians engage in farming to any extent. During the tourist season they act as canoemen and guides and in all agencies they manufacture baskets, wooden handles, hockey sticks, butter tubs, churns, barrels, etc. In recent years there has been an increase in the demand for Indian handicraft.

Dwellings.—The homes in most of the reserves consist of one and one-half story frame buildings, fairly well finished on the outside, but not on the inside.

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 restricted mostly to the growing of potatoes for their own use. A number of the Indians find employment in lumber camps and others work as day labourers. In the southern part of the Province they are engaged commercially in the manufacture and sale of Indian wares.

Dwellings.—New houses have recently been constructed and housing conditions have shown a marked improvement.

QUEBEC

Agencies.—The Indian agency offices in Quebec are located as follows: Bersimis, Cacouna (Viger), Caughnawaga, Gagne (Maria), Gaspe, Gentilly (Bécancour), 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 Bécancour 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 and trapping for their subsistence. In the organized central and southern portions of the Province they engage in mixed farming. They are good gardeners and a number of them

raise fruit and dispose of it at nearby markets. They cultivate their land with a considerable measure of success. Where they possess cows they sell the milk to the creameries and cheese factories. Most Indians prefer working for an employer to working on their own land. In the Saguenay district they act as guides and canoemen and on the Gaspe Peninsula they can still find employment in lumber camps and mills. Indians act as game guardians on established beaver reserves. The Indians of Caughnawaga are noted as steel workers and find highly remunerative employment when building operations are active. It is chiefly in the Province of Quebec on certain reserves that the native handicraft projects have been organized and have proved successful.

Dwellings.—In the older settled districts of the Province many of the Indians own stone, brick, or frame houses of good construction, comfortable, and sanitary. 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, Chippewa 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, Sutton West (Georgian 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 are generally well suited for this purpose. Assistance has been given from both band funds and appropriation to supply the Indians with equipment with the result that lately additional land has been brought under cultivation. Some do well with dairy products.

The Indians act as guides and canoemen and are employed at various industries and trades. They are proficient bushmen and some find employment in the various lumber camps. Snowshoes, canoes, and moccasins are manufactured. The women also find sources of income; some are employed as domestics; others support themselves by making baskets and fancy work. In certain districts berry picking furnishes considerable income.

Dwellings.—In the more settled districts many of the Indians own houses of brick, stone, or modern frame construction, and on some reserves both houses and farm buildings are comfortable and well built. A number of new houses have been built recently on several reserves and each year sees more Indians of this Province living in modern, well-built homes.

Northern Ontario.—In the remote parts of Ontario hunting and fishing are still the chief sources of livelihood. Acting as guides and canoemen during the summer months adds considerably to the income of the Indians. Although agriculture is not carried on to any extent, most of the bands grow crops of potatoes and vegetables. These Indians are, of necessity, 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 existence. The reserves in Manitoba most suitable for extensive agriculture are chiefly within the Birtle, Griswold, Portage la Prairie, and Clandeboye Agencies. A great many of the 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 extensively and most of the reserves own good herds of well-bred stock, chiefly of the Shorthorn type. They milk the cows and make butter and other dairy products. Any surplus of hay is put up for sale and on some reserves they own hay presses, shipping their surplus to market in winter. Some Indians make their living during the winter by taking out wood; others work for the large fish companies. The women derive revenue from the sale of moccasins and gloves. Most of them are expert needlewomen.

Dwellings.—On most reserves in Manitoba fairly good log homes are to be found. They are one and one-half stories high with shingle roofs. Most of these homes are whitewashed every year, which improves the sanitation. There is also a large number of houses of frame construction on all the reserves. In the extreme north, of course, the homes 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 à la Crosse district.

Occupations.—The principal occupations of the Indians of Saskatchewan are farming and stock raising. The Indians own a number of cattle of a very good type, principally of Shorthorn breed. They are well equipped with implements and own several horses. In the extreme north the Indians still make their living from hunting and fishing.

Dwellings.—On most of the reserves the Indians are fairly well housed, the homes being usually of log construction with shingle roof. There are also a few homes of frame construction. The Indians in the north move about and their homes when they are out on the hunting grounds consist of an old 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; Plains Crees found in the Lesser Slave Lake, Saddle Lake, Edmonton, and Hobbema Agencies.

Occupations.—Farming and stock raising are the principal occupations. The farming Indians in this Province are very well equipped with machinery and horses to carry on their work, as the Indians in the south own large herds of horses. In good years the Indians derive a considerable revenue from the sale of hay. The Indian cattle herds in this Province are of a very good type and many bring a premium on the market. The breeds are principally Shorthorn and Hereford with a few Aberdeen Angus. They receive good returns from the sale of beef cattle. In the northern portions of the Athabaska and Lesser Slave Lake Agencies the Indians are hunters and make their living from that source. The Indians in other parts of the Province derive revenue also from fishing, working for white farmers and stockmen, and from the sale of wood. The Blackfoot Indians, during the winter, get good returns from their coal mines, which they operate themselves under the supervision of a white miner.

Dwellings.—Practically all of the Indians in this Province own good homes. On the Blackfoot Reserve every family has a fair house of good construction and good barns. Frame houses and barns are also to be found on the Sarcee Reserve south of Calgary and on the Edmonton Reserve. On the other reserves the homes are mostly of log construction with shingle roofs, but there is also a large number of frame houses belonging to more prosperous Indians. These are being added to each year and sanitary conditions are being improved.

BRITISH COLUMBIA

Agencies.—The Indian agency offices in British Columbia are located as follows: Alert Bay (Kwawkewlth), Bella Coola, Cranbrook (Kootenay), Duncan (Cowichan), Port 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.—Fishing is the main occupation from which these Indians derive their living. Many own power-boats and up-to-date equipment and either fish independently or by contract with the canneries. The summer salmon fishing is a source of annual revenue. Trapping on registered trap-lines is also

a means of livelihood. There are Indians of this Province engaged in fruit growing, some of them owning orchards. A seasonal migratory labour movement is particularly noticeable, many Indians, often in family groups, follow the seasonal crops of fruit, hops, etc., even entering the United States in their wayfaring.

Dwellings.—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 Kwakiutls of Bella Bella. The Indians of the west coast of Vancouver Island also 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. 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. A number of coast Indian villages are equipped with electric light and sidewalks whereas their adjoining white neighbours have neither of these services. The aim in the cattle raising and farming agencies is to discourage the village system and encourage Indians to build homes on their individual farms. On reserves occupied only during the fishing season the Indians live in rough shacks.

NORTHWEST TERRITORIES

Agencies.—The Indian Affairs Branch now 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, who extend to the Mackenzie Delta; and the Copper Mines, who are located along Coppermine River. The territory occupied by these two last-named tribes is continguous to that inhabited by the Eskimos.

Occupations.—The Indians depend almost entirely upon hunting and trapping for a livelihood. Here and there some cultivate small plots of potatoes. They own no cattle or horses, their mode of transportation being by boat, usually along the great waterways in the summer, and with dogs in the winter. They catch and preserve large quantities of fish for their own use and for food for the dogs during the winter. They also pick and dry large quantities of wild berries for winter use.

Dwellings.—The Indians live in log cabins in winter, using 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 headwaters 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 also 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 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	2,311	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	4,256	.....	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		Green Feed		Acres of Garden	Acres Broken	Acres Summer-fallowed	Tons of Hay	Total Acres under Cultivation
	Acres Sown	Bushels Harvested	Acres Sown	Bushels Harvested	Acres Sown	Bushels Harvested	Acres Sown	Bushels Harvested	Acres	Tons					
Prince Edward Island	1	25	32	960	.....	.....	12	1,880	.....	.....	2	2	.....	40	49
Nova Scotia	.....	.....	29½	529	2	25	124	5,242	23½	126	44½	39	101	315	363
New Brunswick	.....	.....	98	1,020	14	135	84½	4,338	.....	.....	21½	12	.....	166	230
Quebec	33	301	1,593	21,875	536½	9,682	561½	10,461	72	276	248	641	506	3,437	4,191
Ontario	2,474	47,253	21,377	536,467	6,594	126,126	2,342	88,139	1,290	3,270	1,180½	4,702	3,170	15,583	43,129½
Manitoba	3,976	71,169	1,817	32,680	1,061	17,609	439	30,864	474	329	129	1,981	1,867	17,604	11,744
Saskatchewan	15,243	214,951	10,511	148,222	1,317	21,143	479	34,257	1,450	1,610	234	4,009	12,568	27,782	45,811
Alberta	21,241	294,366	9,201	193,457	2,593	33,474	317	8,751	2,876	2,436	47	1,658	19,761	13,981	57,694
British Columbia	4,446	86,408	2,987	63,215	487½	10,749	2,035½	181,227	3,195	3,714½	936½	10,243	1,208	28,815	25,538½
Northwest Territories	.....	.....	.....	.....	.....	.....	49½	1,871	3	7	½	2½	1½	56	57
Yukon	.....	.....	.....	.....	.....	.....	1	36	.....	.....	1½	.....	.....	46	2½
	47,414	714,473	47,645½	998,425	12,605	218,943	6,445½	367,066	9,383½	11,768½	2,844½	23,289½	39,182½	107,825	188,809½

TABLE 3

Land; Private and Public Buildings and Property

Province	Total Area of Reserves (Acres)	Acres under Wood	Acres Cleared but not Cultivated	Acres under Actual Cultivation	Acres Fenced	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	Sawmills	Other Buildings	Engines and Machinery
Prince Edward Island	1,508	1,444	15	49	188	37	.....	22	14	9	8	.....	25	1	1	1	.....	1	.....
Nova Scotia	18,250	14,116½	3,775	358½	1,944	436	74	140	81	18	88	12	1,257	12	5	11	1	5	4
New Brunswick	49,216	43,966	5,020	230	1,152½	372	36	223	64	18	65	22	1,105	6	5	11	.....	3	1
Quebec	167,290	138,379	24,720	4,191	14,801	1,392	388	2,266	618	279	1,307	121	5,189	16	5	24	.....	26	31
Ontario	1,592,295	1,353,241	196,214½	42,839½	100,493	2,508	2,343	5,230	3,808	1,222	3,344	562	50,844	93	38	85	11	108	117
Manitoba	540,137	326,873	201,520	11,744	51,195	145	2,852	1,960	883	667	1,361	66	8,148	59	13	42	3	109	50
Saskatchewan	1,284,751	529,378	709,562	45,811	340,106	240	2,314	3,017	2,388	1,759	2,757	38	15,836	41	19	27	3	80	70
Alberta	1,225,710	350,851	817,165	57,694	487,693	422	1,868	2,439	2,421	1,499	2,490	83	9,125	6	9	7	1	148	265
British Columbia	798,523	447,921½	325,053½	25,548½	297,227½	4,605	2,944	4,219	2,816	875	2,349	469	37,984	159	67	57	8	68	142
Northwest Territories	1,924	1,753	114	57	56	.....	644	174	4	.....	.....	.....	806	.....	.....	1	.....	.....	.....
Yukon	160	152	5½	2½	5½	1	.....	3	3	1	4	1	2	1	.....	.....	.....	1	3
	5,679,764	3,208,075½	2,283,164½	188,524½	1,234,861½	10,158	13,463	19,693	13,100	6,347	13,773	1,374	130,321	394	162	266	27	549	683

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
Prince Edward Island	.....	7	.....	.....	.....	10	13	4	145	4	9	6	75	10	.....
Nova Scotia	1	36	6	6	8	133	80	61	620	18	47	249	1,649	27	22
New Brunswick	.....	6	.....	.....	2	25	19	16	350	39	169	196	1,130	180	52
Quebec	3	509	64	95	2	1,610	751	674	6,230	49	1,024	3,532	18,019	503	799
Ontario	32	2,055	197	106	440	2,485	1,430	3,720	34,476	514	3,359	5,667	120,216	5,466	2,362
Manitoba	13	1,623	38	50	559	1,879	1,139	377	6,020	85	1,709	3,398	57,845	6,016	1,825
Saskatchewan	15	4,276	93	72	936	2,769	2,060	1,100	8,146	32	462	2,436	29,711	1,139	1,877
Alberta	123	8,568	893	133	1,671	5,037	4,203	547	4,527	201	631	2,453	20,293	1,655	2,093
British Columbia	190	7,945	1,391	290	4,452	2,747	4,865	2,951	28,760	1,528	3,251	7,781	80,136	2,107	1,994
Nothwest Territories	.....	36	.....	.....	.....	.....	.....	1,595	.....	154	587	1,303	18,970	1,105	503
Yukon	.....	4	.....	1	2	4	3	3	70	1	1	.....	.....	3	2
	377	25,065	2,682	753	8,072	16,699	14,563	11,048	89,344	2,625	11,249	27,021	348,044	18,211	11,529

TABLE 5

Sources and Value of Income

—	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, Including Sand and Gravel Royalties	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
Prince Edward Island	1,500	200	1,700	.....	.....	.....	450	150	550	0 13	4,550 13
Nova Scotia	11,374	710	22,845	25 00	404 63	358 14	1,090	2,300	12,920	1,824 50	53,851 27
New Brunswick	6,450	130	13,800	350 00	78 85	7 50	950	1,195	6,298	2,587 33	31,846 68
Quebec	68,350	8,945	114,420	10,921 81	2,010 02	175 50	2,090	44,765	23,200	20,392 15	295,769 48
Ontario	509,620	27,370	626,090	33,152 05	39,126 29	3,427 69	165,130	326,980	207,295	393,400 83	2,331,591 86
Manitoba	129,306	20,794	73,290	2,275 68	2,933 50	.....	32,970	110,035	35,900	99,600 86	507,105 04
Saskatchewan	310,992	53,021	52,325	11,467 58	70 75	28 45	28,695	63,285	41,366	153,417 78	714,668 56
Alberta	261,344	86,018	46,746	58,081 60	488 77	92 05	5,075	115,444	54,817	230,727 78	858,834 20
British Columbia	397,569	94,710	533,835	46,250 76	31,049 02	2,444 21	508,525	166,295	165,630	52,777 75	1,999,085 74
Northwest Territories	9,520	.....	12,600	.....	.....	.....	14,790	192,800	4,860	19,635 00	254,205 00
Yukon	3,293	113	150	.....	.....	.....	.....	.....	.....	17 17	3,573 17
	1,709,818	292,011	1,497,801	162,524 48	76,161 83	6,533 54	759,765	1,023,249	552,836	974,381 28	7,055,081 13

Statement of Ordinary Expenditure for the Year 1939-40

—	Administration	Indian Agencies	Reserves and Trusts	Medical	Grants to Hospitals	Welfare	Education	Grants to Res. Schools	Grants to Exhibitions	Total
	$	$	$	$	$	$	$	$	$	$
Nova Scotia	.....	9,927	.....	35,742	.....	75,948	13,461	28,800	.....	163,878
Prince Edward Island	.....	1,792	.....	6,028	.....	7,535	906	.....	.....	16,261
New Brunswick	2	9,925	.....	19,017	.....	65,295	18,216	.....	.....	112,455
Quebec	108	43,372	2,545	101,258	.....	216,956	58,650	18,898	.....	441,787
Ontario	66	118,324	1,331	188,786	.....	141,694	126,901	268,544	2,338	847,984
Manitoba	4	75,538	541	111,704	1,000	107,045	72,708	162,090	290	530,920
Saskatchewan	834	139,546	358	86,719	.....	102,713	59,691	279,785	850	670,496
Alberta	1,185	108,137	90	93,506	.....	95,426	9,322	325,261	868	633,795
British Columbia	2,135	129,067	2,799	212,156	5,000	107,487	96,929	324,369	1,050	880,992
Northwest Territories	.....	22,894	.....	42,967	.....	23,823	2,922	43,696	.....	136,302
Yukon	.....	1,438	.....	13,532	.....	12,454	5,383	16,291	.....	49,098
Headquarters and Miscellaneous	51,393	20,020	29,877	16,399	.....	28,395	93,073	.....	500	239,657
Hospitals and Nursing Stations	.....	.....	.....	129,641	.....	.....	.....	.....	.....	129,641
Tuberculosis Control	.....	.....	.....	380,115	.....	.....	.....	.....	.....	380,115
B.C. Special	.....	2,135	.....	34,985	.....	29,993	9,944	.....	.....	77,057
B.C. Special, Surveys and Engineering Branch	.....	21,087	.....	.....	.....	.....	.....	.....	.....	21,087
Surveys and Engineering Branch	.....	22,598	.....	.....	.....	.....	61,340	.....	.....	83,938
Pensions and Gratuities	.....	2,870	.....	300	.....	.....	.....	.....	.....	3,170
Total	55,727	728,670	37,541	1,472,855	6,000	1,014,764	629,446	1,467,734	5,896	5,418,633
Indian Annuities	.....	.....	.....	.....	.....	.....	.....	.....	.....	259,594
										5,678,227

Open Account—Indian Act Revolving Fund

EXPENDITURE 1939-40

Quebec	$ 3,672 70	
Manitoba	5,560 53	
Saskatchewan	19,470 40	
Alberta	2,709 05	
		$ 31,412 68
Less Repayments and Refunds		
Quebec	$ 5,161 03	
Manitoba	373 04	
Saskatchewan	904 08	
Alberta	265 85	
		$ 6,704 00
Net Expenditure		$ 24,708 68

Net Expenditure by Provinces, 1939-40

FUR CONSERVATION

Quebec	$ 1,873 42
Manitoba	48,081 36
Saskatchewan	8,027 08
British Columbia	575 00
Head Office (Miscellaneous)	5,176 08
	$ 63,732 94

Annuities Paid and Interest on Indian Trust Funds, 1939-40

ALBERTA

Athabaska	$ 8,950 00
Blackfoot	122,939 26
Blood	8,897 41
Edmonton	23,839 77
Fort St. John	1,780 44
Hobbema	17,320 04
Lesser Slave Lake	26,025 36
Peigan	6,483 09
Saddle Lake	7,796 79
Sarcee	2,683 98
Stony	5,792 08
	$ 232,508 22

NORTHWEST TERRITORIES

Fort Norman	$ 7,005 00
Fort Resolution	7,100 00
Fort Simpson	5,530 00
	$ 19,635 00

BRITISH COLUMBIA

Babine	$ 629 55
Bella Coola	665 51
Cowichan	6,003 86
Kamloops	1,111 41
Kootenay	774 06
Kwawkewlth	4,167 63
Lytton	4,128 25
New Westminster	15,782 29
Nicola	183 38
Okanagan	1,045 26
Queen Charlotte	147 88
Skeena River	2,802 15
Stikine	0 96
Stuart Lake	1,448 74
Vancouver	10,117 93
West Coast	1,605 55
Williams Lake	382 90
	$ 50,997 31

MANITOBA

Birtle	$	3,634 14
Clandeboye		15,461 22
Fisher River		11,240 85
Fort Churchill and York Factory		3,250 00
Portage la Prairie		20,505 34
Griswold		455 67
Norway House		18,157 01
The Pas		26,896 63
	$	99,600 86

NEW BRUNSWICK

Northern Division	$	1,027 16
Northeastern Division		1,433 95
Southwestern Division		126 22
	$	2,587 33

NOVA SCOTIA

Nova Scotia	$	1,824 50

PRINCE EDWARD ISLAND

Prince Edward Island		0 13

ONTARIO

Cape Croker	$	21,518 56
Caradoc		3,314 97
Chapleau		2,940 10
Christian Island		15,215 50
Fort Frances		15,870 63
Georgina Island		3,611 36
Golden Lake		17 04
James Bay		8,040 00
Kenora		24,961 10
Manitoulin Island		29,704 11
Moravian		5,806 58
Parry Sound		17,310 25
Port Arthur		16,202 48
Rama		7,997 11
Rice Lake		16,999 11
Sarnia		16,784 23
Saugeen		16,084 53
Sault Ste. Marie		19,702 32
Scugog		1,390 78
Six Nations		47,670 47
Sturgeon Falls		69,339 79
Sioux Lookout		24,246 07
Tyendinaga		5,366 07
Walpole Island		3,307 67
	$	393,400 83

QUEBEC

Bécancour	$	360 48
Bersimis		7,159 74
Cacouna		489 12
Caughnawaga		899 24
Lorette		776 09
Maniwaki		3,997 31
Manowan		2,040 91
Maria		—
Mingan		—
Oka		556 77
Pierreville		347 44
Pointe Bleue		367 93
Restigouche		226 31
St. Regis		3,063 58
Timiskaming		2,137 89
Seven Islands		10 25
	$	22,433 06

SASKATCHEWAN

Battleford	$	19,674 56
Carlton		23,963 90
Crooked Lakes		29,547 91
Duck Lake		10,305 53
File Hills		4,099 11
Onion Lake		7,560 12
Pelly		12,258 60
Qu'Appelle		26,498 15
Touchwood		19,506 34
Wood Mountain		3 56
	$	153,417 78

YUKON

Yukon Indians	$	17 17

Indian Trust Fund

Showing Transactions in Connection with the Fund During the Fiscal Year Ended March 31, 1940

Service	Debit	Credit
	$ cts.	$ cts.
Balance March 31, 1939		14,149,503 19
Collections on land sales, timber and stone dues, rents, fines, fees, etc.		610,470 59
Interest for the year ending March 31, 1940		718,322 89
Credit transfers during the year		9,709 82
Expenditure during the year	1,178,906 12	
Transfers by Warrant, etc.	11,343 78	
Balance March 31, 1940	14,297,756 59	
	15,488,006 49	15,488,006 49

School Statement

Statement Showing the Enrolment by Provinces in the Different Classes of Schools for the Fiscal Year Ended March 31, 1940

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		80	87	167	163	97·60	43	23	30	25	11	16	19		
Quebec	2	1		1		38	42	80	76	95·00	49	10	7	13	1				
Ontario	13	5	1	6	1	823	891	1,714	1,628	94·98	511	308	221	187	158	142	101	61	25
Manitoba	9	1	1	4	3	489	567	1,056	995	94·22	356	146	176	125	101	67	31	27	27
Saskatchewan	14	3		9	2	834	918	1,752	1,675	95·60	605	249	235	246	177	129	68	35	8
Alberta	19	5		12	2	961	988	1,949	1,863	95·58	618	305	287	251	224	140	75	41	8
Northwest Territories	4	1		3		89	123	212	203	95·75	114	29	32	14	19	4			
British Columbia	15	2		9	4	952	1,073	2,025	1,970	97·28	651	333	282	257	226	147	84	38	7
Yukon	2	2				37	35	72	70	97·22	17	10	10	12	12	6	3	1	1
Total—Residential Schools	79	20	2	45	12	4,303	4,724	9,027	8,643	95·74	2,964	1,413	1,280	1,130	929	651	381	203	76

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	7	8	15	13	86·66	7	1	2	1	1	2	1		
Nova Scotia	11	145	151	296	207	69·93	141	43	33	22	17	18	8	12	2
New Brunswick	11	161	163	324	247	76·23	103	46	48	45	30	22	18	12	2
Quebec	30	775	767	1,542	1,199	77·75	607	252	211	194	126	78	46	27	1
Ontario	86	1,384	1,410	2,794	1,973	70·61	1,050	416	337	254	264	180	153	134	6
Manitoba	44	668	583	1,251	731	58·43	710	202	142	99	46	34	12	5	1
Saskatchewan	28	323	346	669	476	71·15	361	118	72	61	37	13	4	3	
Alberta	2	18	14	32	18	56·25	12	4	3	3	8	1	1		
Northwest Territories	4	20	40	60	29	48·33	36	9	10	3	1	1			
British Columbia	65	994	1,041	2,035	1,293	63·53	1,038	322	223	197	128	72	41	12	2
Yukon	6	54	68	122	74	60·65	84	20	9	9					
Total—Day Schools	288	4,549	4,591	9,140	6,260	68·49	4,149	1,433	1,090	886	658	421	284	205	14

SCHOOL STATEMENT—*Continued*

COMBINED WHITE AND INDIAN 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
Quebec	1	12	11	23	12	52·17	22	1	.....	.....	.....	.....	.....	.....	.....
Ontario	5	90	69	159	116	72·95	52	27	22	11	17	6	11	10	3
Manitoba	3	20	13	33	18	54·54	18	7	5	.....	1	1	.....	1	.....
Saskatchewan	1	2	5	7	5	71·43	2	2	2	.....	.....	.....	.....	1	.....
British Columbia	1	1	6	7	6	85·71	2	1	1	2	.....	.....	1	.....	.....
Total—Combined White and Indian Day Schools	11	125	104	229	157	68·56	96	38	30	13	18	7	12	12	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	7	8	15	13	86·66	7	1	2	1	1	2	1	.....	.....
Nova Scotia	11	1	.....	12	225	238	463	370	79·91	184	66	63	47	28	34	27	12	2
New Brunswick	11	.....	.....	11	161	163	324	247	76·23	103	46	48	43	30	22	18	12	2
Quebec	30	2	1	33	825	820	1,645	1,287	78·24	678	263	218	207	127	78	46	27	1
Ontario	86	13	5	104	2,297	2,370	4,667	3,717	79·64	1,613	751	580	452	439	328	265	205	34
Manitoba	44	9	3	56	1,177	1,163	2,340	1,744	74·53	1,084	355	323	224	148	102	43	33	28
Saskatchewan	28	14	1	43	1,159	1,269	2,428	2,156	88·79	968	369	309	307	214	142	72	39	8
Alberta	2	19	.....	21	979	1,002	1,981	1,881	94·95	630	309	290	254	232	141	76	41	8
Northwest Territories	4	4	.....	8	109	163	272	232	85·29	150	38	42	17	20	5	.....	.....	.....
British Columbia	65	15	1	81	1,947	2,120	4,067	3,269	80·37	1,691	656	506	456	354	219	126	50	9
Yukon	6	2	.....	8	91	103	194	144	74·23	101	30	19	21	12	6	3	1	1
Total	288	79	11	378	8,977	9,419	18,396	15,060	81·87	7,209	2,884	2,400	2,029	1,605	1,079	677	420	93

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.

The organization through which the Department functions under the Minister and the Deputy Minister, consists of a Head Office in Ottawa, four District offices in Canada, one in London, England, and an office in Hong Kong. The Head Office organization consists of a Director of Immigration, a Commissioner of Immigration and his Assistant, with the staff necessary to deal with a daily mail which in the year under review averaged 1,000 incoming letters, telegrams, and cables, to say nothing of innumerable long distance telephone requests, and an outgoing mail of 600. There are units dealing with the collection and preparation of statistics, with juvenile immigration, and with women's work.

The four Districts in Canada are known as the Atlantic, which covers all territory east of the Ontario-Quebec boundary; the Eastern, which includes all the Province of Ontario east of Schreiber; the Western, which extends from Schreiber, Ont., to Kingsgate, B.C.; and the Pacific, which includes all territory west of Kingsgate. All immigration and colonization matters relating to the British Isles and Continental Europe, come under the immediate control of the Commissioner of European Emigration, W. R. Little, Oceanic House, 1A Cockspur Street, London. A special office is maintained at Hong Kong to deal with the administration of the Chinese Immigration Act and Regulations.

Canada's greatest immigration year was 1912-13 when the total reached was 382,841. It fell rapidly during the war years that followed and while there was some increase following the war, the largest returns for any year was in 1928-29 when the total reached 167,723. There was a rapid decline following 1930 and the lowest point was reached in 1935-36 when the total was but 11,103. The total for 1938-39 was 17,128 and for the year now under review, 16,205. The reduction is owing largely to the outbreak of war which shut off many of the avenues of immigration.

The total 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

The statistical data presented for 1939-40 are somewhat reduced, nineteen tables having been dropped from this year's report. It is believed, however, that all essential information has been included.

It will be observed that the number of persons entering Canada during the year equalled more than 2½ times Canada's entire population. These figures of course include many who have passed back and forth across the border a number of times during the year. The bulk of the non-immigrant movement consists of tourists and people travelling on business. Immediately on the outbreak of war interests unfriendly to Canada spread rumours calculated to discourage the entry of tourists and others. Amongst the supposed difficulties was that those entering would not be allowed to leave, that they would be required to perform military service, and that their funds would be seized. While there was not a vestige of truth in the rumours they resulted in an immediate slowing down of tourist business despite every effort made to expose their fallacy. The total figures for the year are lower than those of last year, but the full effect of war conditions on the tourist industry will not be disclosed until 1940-41.

The work of the early months of the year was characterized by intensified efforts on the part of Europeans to secure admission to Canada. This was caused mainly by the spread of Nazi influence and fear of the outbreak of war, and brought to the Immigration Service thousands of urgent requests for help to escape from Europe.

In the 1938-39 report a reference was made to the increasing difficulty of moving capital from Europe to Canada and to the problem of immigration minus capital. This condition was accentuated in the summer of 1939 and with the outbreak of war in September of that year, the flow of capital from Continental Europe was reduced almost to the vanishing point. There were, however, some who had earlier transferred their funds beyond the reach of Germany. As the war spread it created travel difficulties and finally closed most of the ports of Continental Europe to the exit of immigrants. This closing of exits brings to an end, for the time being at least, an interesting and effective plan originated and developed by Canada shortly after the last war for the determination of fitness of immigrants before leaving Europe. In 1920 Canada, the first immigration country to adopt the principle of overseas civil and medical inspection, opened an office at Antwerp, Belgium, and the service was gradually extended until it covered most of the ordinary avenues of travel. The plan proved to be a protection to intending migrants and also to Canada. It enabled immigrants to find out whether they could be admitted before undertaking the long and costly journey to Canadian ports and it protected Canada against the arrival of many who would be found inadmissible on mental, moral, physical, or other grounds. Since the war Canadian immigration and medical officers have had to be withdrawn from Poland and Germany.

The outbreak of war necessitated an amendment to the Immigration regulations to deal with enemy aliens. Inspectional facilities had also to be extended and greater care taken in the examination of persons seeking entry in order to exclude all dangerous elements. As the year closed there was increasing difficulty with foreign seamen arriving at Canadian ports.

In last year's report there was a brief reference to efforts made to provide a haven of refuge in Canada for Czech families who had to leave the Sudeten area on its occupation by Germany. With the valuable co-operation of the Colonization Branches of the Canadian National Railways and the Canadian Pacific Railway Company, both in recruiting and settlement, it was anticipated that about 1,000 families might be secured. The way to the achievement of this plan was closed earlier than was expected and only 303 families and 72 single men arrived in Canada under this scheme. These have been settled in northern Saskatchewan and in northern British Columbia. The results to date reflect great credit on the Colonization Departments of the railways.

During the year many refugees and others were admitted to Canada, bringing capital and skill for the establishment of new industries that are likely to

be of great value to the Dominion. Many of the applications came to the Department direct, while others were received from transportation companies and from relatives or friends in Canada. Every case has had to be considered on its merits and many of them have involved references to other Departments of Government which have rendered valuable help. There have also been many references to business concerns already established in Canada. While numerous industries have been secured and refugees admitted, establishment in Canada is necessarily a gradual process and their value will become increasingly evident as time goes on.

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 readmitted 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

REPORT OF THE CHIEF CONTROLLER OF CHINESE IMMIGRATION

Between the years 1885 and 1923 immigration legislation governing the admission to Canada of persons of Chinese origin imposed a head tax which commenced at $50 and was twice increased to a maximum of $500 per person. Those exempted from such tax by Statute were merchants, their families, university students, and persons of the non-immigrant classes. The Chinese Immigration Act of 1923 abolished the head tax, restricted the admission of immigrants to merchants, and provided for the temporary entry of Government representatives, university students, and other non-immigrants. The present Chinese Immigration Act has been in existence 17 years and a total of 6 Chinese immigrants have been admitted thereunder. For the seventeen-year period prior to June, 1923, 44,453 Chinese immigrants were admitted to Canada. During the fiscal year 1939-40 only 2 persons of Chinese origin filed applications for admission as immigrants and both were found to be inadmissible. Five students were granted entry as non-immigrants to attend Canadian universities during this period.

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. Bonds are usually required guaranteeing

that the persons allowed entry will follow no other occupation than that for which admission is granted and will leave Canada within the period of validity of the permit. Sixty-nine permits were issued during 1939-40. The majority of these covered the temporary entry of actors and actresses to perform at Chinese theatres in Canada. Permits issued for the previous 5 years average 38 per annum. During the year 1939-40, 38 persons in Canada under permit effected their departure; this number includes 14 of the 69 referred to above.

Under the provisions of the Chinese Immigration Act the right to return to Canada of Chinese legally admitted thereto is protected for a period of 2 years by registration at the port of departure. Failure to register or to return within such period means loss of status in Canada, and return can then only be effected by the person concerned qualifying as a new arrival. During this fiscal year 806 Chinese registered prior to leaving Canada, which is an increase of approximately 20 per cent over the registration during 1938-39. A total of 127 Chinese departed from Canada without registering and 134 who had registered and departed failed to return within the registration period; all of these have forfeited their right of re-entry to Canada. During the five-year period ended March 31, 1940, 4,002 Chinese have departed from Canada and have forfeited their right to return.

Chinese persons employed on vessels which depart from Canadian territorial waters are required to register to protect their right of re-entry to Canada. One hundred and twenty-seven such seamen registered during the year.

The Chinese Immigration Act, in common with the general Immigration Act, sets out specifically the classes whose entry to Canada is prohibited, provides machinery for the deportation of undesirables, and authorizes penalties for violations of the Act. Twenty-four Chinese were deported during the period under review; 21 following convictions under the Opium and Narcotic Drug Act, 1929. One bond of $1,000 was estreated.

The Department maintains special staffs at Ottawa, on the Pacific Coast, and in Hong Kong to deal with the administration of the Chinese Immigration Act, and there are also controllers at the principal Atlantic ports and at other points in Canada. The departmental machinery developed over a period of years for regulating the entry to Canada of persons coming within the scope of the Act enables immigration officials to deal promptly and efficiently with all applicants.

There have been no changes in the regulations during the period under review.

REPORT OF THE COMMISSIONER OF IMMIGRATION

At Head Office there is a total staff of 84, and in the field and inspectional service at home and abroad there are 644 Immigration officers including seasonal officers and 295 part-time officers, practically all of whom are Customs officers who do both customs and immigration work. These figures indicate that most of the activities of this Branch have to do with inspectional and field work in Canada and abroad. For the purpose of control of these activities, the Dominion is divided into four districts each with a District Superintendent. The Atlantic District is in charge of Mr. G. G. Congdon; the Eastern District, Mr. J. S. Fraser, the Western District, C. E. S. Smith, and the Pacific District, F. W. Taylor.

There are 39 Canadian seaports, 196 International Boundary ports some of which are airports, 4 examination stations in the United States, and 5 inland agencies, making a total of 244 examination stations. Abroad there were, at the end of the year, 4 offices in the British Isles, 2 in Continental Europe, and 1 at Hong Kong.

The increase of travel facilities by motor, the opening of international highways, and the more recent development of air travel, have all added to the problems of inspectional work. In the Atlantic and the Pacific Districts this has to do both with ocean ports and with International Boundary ports. In the Atlantic District the arrivals at ocean ports are mainly British and Europeans, and at Pacific ports they are largely Chinese, Japanese, and East Indians.

Next to boundary inspection in which by far the largest part of the field staff is employed, comes investigational and Board of Inquiry work. Investigations are required for a variety of reasons, chief amongst which are inquiry into settlement arrangements for those seeking entry, matters connected with illegal entry, and questions of contract labour. The inquiries made on the three grounds mentioned have totalled thousands each year. A Board of Inquiry may be described as a court set up under the Immigration Act for determining whether a person against whom a complaint has been made is an undesirable within the meaning of the Immigration Act and whether he can and should be deported. The number of investigations and of Boards of Inquiry in the various districts for 1939-40 was as follows:—

	Investigations	*Boards of Inquiry*
Atlantic	9,829	121
Eastern	10,886	249
Western	5,853	125
Pacific	1,089	178

Deportations for 1939-40 totalled 394 as compared with 424 the previous year. Of this total, 145 were sent to the United States and the remaining 249 to 35 other countries. Only 18 persons were deported as public charges. Those deported after having been convicted of criminal offences totalled 85; for convictions under the Opium and Narcotic Drug Act, 25; for mental causes, 28; and for entry by misrepresentation or stealth, 198. Twenty-five persons were deported a second time during the year. The difficulties of returning undesirables to European States increase from year to year and in many cases it is now impossible to arrange return because of the refusal of some European States to recognize the retention of citizenship of persons who have settled abroad.

The outbreak of war has thrown upon Immigration officers greater responsibilities and increased duties and nowhere is this more apparent than on the Pacific Coast where a close check-up is being maintained to prevent the entry by stealth of persons from the Far East and to deal with those who may already have entered Canada by that method.

The number of persons rejected at ocean ports since the establishment of inspectional service in Europe has fortunately been very small. For example, at the port of Quebec where, prior to the establishment of the inspectional service abroad, hundreds were sometimes detained at one time, the number rejected for the whole year was just 26. For the port of Montreal the number was 27 and for Halifax 29.

In striking contrast to the record at ocean ports there have been many rejections on the International Boundary; these by Districts were as follows:—

Atlantic	2,413
Eastern	6,187
Western	672
Pacific	724

The term "rejection" is applied to persons who are refused admission to Canada for any cause, and the term "deportation" is applied to persons who are removed from Canada under authority after having entered the country. With few exceptions those rejected or ordered deported have the right of appeal to the Minister. The Board of Inquiry or the examining officer acting as such, in addition to supplying a transcript of the evidence showing the grounds upon

which his order was issued, is required to give his views in writing, and must advise the person rejected or ordered deported, of his right of appeal. An appeal may be taken without any cost to the appellant other than the time necessary to obtain the decision on the appeal. On the International Boundary the practice is to leave the appellant in United States territory where he has his liberty. Where action is taken within Canada and persons are not already in detention, such as in prison they are not usually detained pending the outcome of the appeal. During the year 606 appeals were dealt with by the Minister.

On the whole the field and inspectional work during the year has been of a high order and performed both intelligently and cheerfully and with the least possible annoyance and discomfort to the travelling public. Efficiency, however, is secured only by constant watchfulness both on the part of the officers themselves and of the supervisory staff.

REPORT OF THE COMMISSIONER OF EUROPEAN EMIGRATION FOR CANADA

The movement of settlers during the period under review comprised those from the British Isles, agriculturalists and industrialists from Central Europe, houseworkers from Scandinavian countries, and a special group of Czechoslovakian families who were settling on the land under the auspices of the Colonization Departments of the Canadian Railways.

After the invasion of Austria, Czechoslovakia, and Poland, large numbers of applications were received in this office from refugees who had escaped from these countries. Most of the applications were from aliens who had been admitted temporarily or otherwise to the United Kingdom, France, Belgium, Holland, and other countries contiguous to occupied territory. Among those who applied and were examined in the London Office were industrialists who formerly controlled large enterprises in Central European countries, e.g., textile industries, high-grade glass factories, coal mines, heavy industries, beet factories, jute factories, saw mills, pulp and paper industries. Industrialists were carefully examined as to experience, the scope of their former industries, markets, export trade, capital available for transfer, and evidence was submitted in the form of illustrations or samples of goods manufactured. The record of each case was then submitted to Ottawa for further consideration and decision. The Chief Trade Commissioner of the Department of Trade and Commerce co-operated very closely by furnishing up-to-date information and particulars for industrial investment in Canada. Many similar applications were submitted by the industrial departments of the Canadian Railways.

British Emigration

During the few months prior to the outbreak of the war and for some time afterwards more than the usual number of inquiries were received from British subjects and persons of other nationalities. Some of these inquirers had independent means and a considerable number had moderate capital. Their object was to take up residence in Canada and to seek employment or start up in business of some kind. A small proportion of these inquirers were farmers and farm workers and others were skilled engineers, electricians, and aeroplane workers. There were also clerks and unskilled workers who were anxious to improve their conditions. Since September 1939 there has been a movement to Canada of technicians to assist in speeding up the manufacture of aeroplanes and munitions. Every facility has been given to the entry of qualified British subjects for this purpose. Monthly reports show that British subjects who inquired at the London and District Offices were in possession of capital of over $6,700,000 and some were in receipt of incomes totalling approximately $150,000 per annum. These figures do not include persons whose capital was less than $500.

There has been a very small movement of British juveniles. Those between 16 and 18 have been absorbed in factories and various industries in the United Kingdom. Some juveniles were forwarded under the auspices of several voluntary societies.

The following is a record of the correspondence in the London and District offices:—

	Letters received	Letters despatched
London	41,273	29,999
Liverpool	2,643	3,138
Glasgow	3,103	4,149
Belfast	1,852	1,418
	48,871	38,704

Distressed Canadians

The number of distressed Canadians who were returned to Canada was 65 of whom 34 were repatriated at Government expense. The sum of £155.17.8 was advanced for the temporary assistance of distressed Canadians in London and Glasgow, £40.8.7 was reimbursed to the Canadian Legation in Paris, and £35.19.0 to the Canadian Legation in Brussels for a similar purpose. The sum of £173.17.11 was refunded through the Foreign Office to British Consuls who had made advances to distressed Canadians in foreign countries.

Under the authority of the High Commissioner assistance was rendered to survivors of the ss. *Athenia* to the extent of £1,815 of which the Corporation of Glasgow was paid £1,315 and the Corporation of Greenock £370. An expenditure of £130 on account of some of the *Athenia* passengers was also incurred by the Minister of Local Government and Public Health, Eire, who declined reimbursement and rendered the service without payment.

Continental Emigration

Visas were granted to 810 family units from Central Europe for settlement on farms under the auspices of the Colonization Departments of the Canadian Railways. Of this number, 507 families were in possession of a total capital of approximately $1,380,000, and the remainder of 303 Czechoslovak families had at their disposal for actual settlement the sum of $518,292.

The number of industrialists or persons of other occupations admitted by special regulation was 69 and they had a capital of $4,200,000.

The total number of non-immigrant visas granted in the London Office was 44 and the number granted by district offices on the Continent was 645. Most of the applicants for non-immigrant visas were visitors, while others stated they were proceeding to Canada to investigate business prospects with a view to settlement. Many of these applications had to be refused because the applicants were not in possession of valid passports and could not return either to the country of which they were citizens or to the country where they resided. As a matter of fact many of these aliens had no intention of returning to the country of their former citizenship; others simply wanted to proceed to Canada temporarily for the purpose of subsequently seeking entry to some other country.

ANNUAL STATISTICAL TABLES, 1939-40

TABLE 1

Immigration to Canada from 1900 to 1940

——	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 March 31, 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	14,095	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

TABLE 2

Immigration to Canada for the Period July 1, 1900, to March 31, 1910

—	Fiscal Years										Totals
	1900–1	1901–2	1902–3	1903–4	1904–5	1905–6	Nine Months Ended March 31, 1907	1907–8	1908–9	1909–10	
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	553	79	75	1,443
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
	1910–11	1911–12	1912–13	1913–14	1914–15	1915–16	1916–17	1917–18	1918–19	1919–20	
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	9,705	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	2,052	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	83	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	108	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	1,058	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	459	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	486,738
From the United States	104,884	114,325	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
	1920–21	1921–22	1922–23	1923–24	1924–25	
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	26	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-Slovak	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	59	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

Racial Origin	Fiscal Years					Totals
	1925-26	1926-27	1927-28	1928-29	1929-30	
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	1,096	1,085	902	990	771	4,754
Czech	805	721	714	846	434	3,520
Dalmatian	1	.....	.....	1	7	9
Dutch	1,180	1,974	1,928	1,599	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	2,324	921	8,883
Korean	.....	1	.....	.....	.....	1
Lettish	24	60	77	74	70	305
Lithuanian	165	842	1,037	1,608	964	4,616
Magyar	4,112	4,863	5,318	6,242	5,688	26,223
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	3,397	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, 1940

Racial Origin	Fiscal Years										Totals
	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	
English	14,662	4,275	1,940	1,375	1,380	1,286	1,445	1,949	2,247	2,489	33,048
Irish	4,233	791	323	283	291	249	262	364	387	375	7,558
Scotch	7,872	1,843	764	547	472	484	519	604	665	643	14,413
Welsh	817	179	70	55	55	30	38	55	74	59	1,432
Totals	27,584	7,088	3,097	2,260	2,198	2,049	2,264	2,972	3,373	3,566	56,451
Albanian	25	5	.....	1	3	1	4	8	10	4	61
Arabian	2	.....	2	.....	1	.....	.....	4	4	.....	13
Armenian	21	4	1	7	1	4	3	4	5	2	52
Belgian	255	47	37	41	61	72	93	123	187	100	1,016
Bohemian	11	.....	7	.....	.....	1	1	5	2	332	359
Bulgarian	295	15	8	12	5	22	18	28	29	15	447
Chinese	.....	.....	1	2	.....	.....	1	.....	.....	.....	4
Croatian	482	106	96	108	155	157	240	277	285	106	1,992
Czech	225	69	65	52	77	106	134	188	169	290	1,375
Dalmatian	.....	.....	.....	.....	.....	.....	1	.....	1	.....	2
Dutch	344	33	33	27	44	111	90	119	237	264	1,302
East Indian	80	47	62	33	33	20	13	14	14	11	327
Esthonian	63	6	.....	2	2	2	5	2	12	3	97
Finnish	2,297	92	30	51	59	43	49	79	58	57	2,815
French	347	87	88	74	86	95	135	134	138	152	1,336
German	7,840	727	518	401	301	209	367	523	586	1,021	12,493
Greek	388	20	37	34	35	53	75	115	127	115	999
Hebrew	2,908	202	346	599	335	655	391	317	621	1,321	7,695
Italian	1,007	414	255	267	325	341	299	408	365	186	3,867
Japanese	204	195	115	104	93	83	103	139	46	36	1,118
Jugo-Slavian	364	57	56	63	120	106	106	116	250	55	1,293
Lettish	28	4	.....	4	.....	3	2	11	4	3	59
Lithuanian	466	45	57	37	37	22	42	37	39	49	831
Magyar	2,401	397	364	509	362	314	328	622	532	329	6,158
Maltese	13	5	2	.....	.....	.....	4	2	1	.....	27
Mexican	.....	.....	.....	.....	.....	.....	6	1	2	.....	9
Montenegrin	3	.....	.....	.....	.....	.....	.....	2	8	.....	13
Moravian	2	.....	3	.....	.....	.....	.....	3	9	52	69
Negro	120	15	9	19	5	3	5	9	7	7	199
Persian	2	.....	1	.....	.....	.....	1	2	.....	1	7
Polish	3,997	554	360	374	406	362	432	615	586	297	7,983
Portuguese	5	2	1	2	2	4	2	1	1	1	21
Roumanian	179	22	26	27	52	33	65	77	102	20	603
Russian	879	74	62	61	60	84	79	120	134	134	1,687
Ruthenian	6,413	502	414	421	586	418	855	1,356	1,837	1,509	14,311
Scandinavian—											
Danish	820	53	55	43	21	21	22	40	49	71	1,195
Icelandic	25	.....	1	.....	1	6	.....	3	.....	.....	36
Norwegian	740	70	44	31	37	31	25	27	21	40	1,066
Swedish	730	79	17	19	10	26	16	47	15	13	972
Serbian	140	31	26	37	26	29	35	83	70	17	494
Slovak	1,957	337	252	395	595	432	520	1,249	1,450	206	7,393
Spanish	8	9	7	7	7	6	10	14	6	9	83
Spanish American	1	2	.....	4	.....	.....	.....	3	.....	.....	10
Swiss	211	24	17	19	22	32	49	87	75	49	585
Syrian	54	15	19	14	13	26	19	15	18	14	207
Turkish	7	1	.....	2	.....	.....	1	1	.....	.....	12
Total, Continental, etc	36,359	4,367	3,489	3,903	3,978	3,933	4,646	7,030	8,092	6,891	82,688
From the United States	24,280	14,297	13,196	7,740	5,960	5,121	5,113	5,643	5,663	5,748	92,761
Total immigration	88,223	25,752	19,782	13,903	12,136	11,103	12,023	15,645	17,128	16,205	231,900

TABLE

Immigration to Canada, by Origins, via Ocean Ports, and from

Racial Origin	1930–31			1931–32			1932–33			1933–34		
	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	14,662	7,498	22,160	4,275	4,525	8,800	1,940	4,153	6,093	1,375	2,623	3,998
Irish	4,233	2,904	7,137	791	1,716	2,507	323	1,512	1,835	283	905	1,188
Scotch	7,872	2,917	10,789	1,843	1,732	3,575	764	1,747	2,511	547	1,038	1,585
Welsh	817	231	1,048	179	147	326	70	92	162	55	77	132
Totals	27,584	13,550	41,134	7,088	8,120	15,208	3,097	7,504	10,601	2,260	4,643	6,903
Belgian	255	105	360	47	31	78	37	42	79	41	23	64
Danish	820	184	1,004	53	87	140	55	53	108	43	47	90
Dutch	344	444	788	33	236	269	33	226	259	27	137	164
Finnish	2,297	57	2,354	92	38	130	30	29	59	51	16	67
French	347	4,391	4,738	87	2,734	2,821	88	2,702	2,790	74	1,130	1,204
German	7,840	2,741	10,581	727	1,532	2,259	518	1,180	1,698	401	755	1,156
Icelandic	25	17	42	.....	10	10	1	6	7	.....	10	10
Norwegian	740	645	1,385	70	171	241	44	218	262	31	108	139
Swedish	730	366	1,096	79	195	274	17	165	182	19	110	129
Swiss	211	83	294	24	28	52	17	41	58	19	30	49
Totals	13,609	9,053	22,642	1,212	5,062	6,274	840	4,662	5,502	706	2,366	3,072
Albanian	25	1	26	5	.....	5	.....	.....	.....	1	.....	1
Arabian	2	.....	2	.....	.....	.....	2	.....	2	.....	.....	.....
Armenian	21	1	22	4	1	5	1	4	5	7	3	10
Bohemian	11	57	68	.....	21	21	7	16	23	.....	10	10
Bulgarian	295	.....	295	15	3	18	3	5	8	12	2	14
Chinese	.....	.....	.....	.....	.....	.....	1	.....	1	2	.....	2
Croatian	482	2	484	106	5	111	96	4	100	108	6	114
Czech	225	8	233	69	9	78	65	7	72	52	7	59
Dalmatian	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Indian	80	.....	80	47	.....	47	62	1	63	33	.....	33
Esthonian	63	2	65	6	1	7	.....	1	1	2	2	4
Greek	388	48	436	20	43	63	37	32	69	34	26	60
Hebrew	2,908	513	3,421	202	447	649	346	426	772	599	344	943
Italian	1,007	228	1,235	414	166	580	255	142	397	267	109	376
Japanese	204	1	205	195	.....	195	115	.....	115	104	1	105
Jugo-Slavian	364	27	391	57	9	66	56	11	67	63	3	66
Lettish	28	1	29	4	2	6	.....	4	4	4	.....	4
Lithuanian	466	11	477	45	5	50	57	6	63	37	2	39
Magyar	2,401	71	2,472	397	41	438	364	20	384	509	18	527
Maltese	13	6	19	5	.....	5	2	4	6	.....	.....	.....
Mexican	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....
Montenegrin	3	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moravian	2	.....	2	.....	1	1	3	.....	3	.....	.....	.....
Negro	120	158	278	15	83	98	9	60	69	19	57	76
North American Indian	.....	8	8	.....	34	34	.....	20	20	.....	8	8
Persian	2	.....	2	.....	.....	.....	1	.....	1	.....	.....	.....
Polish	3,997	226	4,223	554	103	657	360	99	459	374	50	424
Portuguese	5	10	15	2	2	4	1	6	7	2	4	6
Roumanian	179	44	223	22	15	37	26	11	37	27	7	34
Russian	819	97	976	74	32	106	62	35	97	61	16	77
Ruthenian	6,413	78	6,491	502	38	540	414	47	461	421	8	429
Serbian	140	18	158	31	16	47	26	18	44	37	10	47
Slovak	1,957	32	1,989	337	9	346	252	8	260	395	6	401
Spanish	8	26	34	9	11	20	7	16	23	7	6	13
Spanish American	1	1	2	2	.....	2	.....	1	1	4	.....	4
Syrian	54	22	76	15	16	31	19	26	45	14	26	40
Turkish	7	.....	7	1	1	2	.....	.....	.....	2	.....	2
Totals	22,750	1,697	24,447	3,155	1,115	4,270	2,649	1,030	3,679	3,197	731	3,928
Grand totals	63,943	24,280	88,223	11,455	14,297	25,752	6,586	13,196	19,782	6,163	7,740	13,903

7

the United States, for the Period April 1, 1930, to March 31, 1940

1934–35			1935–36			1936–37			1937–38			1938–39			1939–40		
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
1,380	2,053	3,433	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
291	727	1,018	249	626	875	262	617	879	364	686	1,050	387	726	1,113	375	710	1,085
472	734	1,206	484	677	1,161	519	639	1,158	604	737	1,341	665	707	1,372	643	702	1,345
55	55	110	30	56	86	38	69	107	55	48	103	74	60	134	59	75	134
2,198	3,569	5,767	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
61	18	79	72	9	81	93	13	106	123	22	145	187	15	202	100	23	123
21	28	49	21	33	54	22	44	66	40	43	83	49	34	83	71	39	110
44	104	148	111	97	208	90	102	192	119	113	232	237	139	376	264	147	411
59	21	80	43	24	67	49	16	65	79	14	93	58	14	72	57	20	77
86	809	895	95	724	819	135	711	846	134	774	908	138	860	998	152	794	946
301	656	957	209	471	680	367	529	896	523	571	1,094	586	507	1,093	1,021	510	1,531
1	12	13	6	6	12	.....	2	2	3	5	8	.....	8	8	.....	4	4
37	93	130	31	94	125	25	74	99	27	91	118	21	84	105	40	89	129
10	83	93	26	89	115	16	73	89	47	95	142	15	90	105	13	80	93
22	21	43	32	18	50	49	16	65	87	18	105	75	22	97	49	32	81
642	1,845	2,487	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
3	.....	3	1	.....	1	4	.....	4	8	1	9	10	.....	10	4	.....	4
1	.....	1	.....	2	2	.....	.....	.....	4	.....	4	4	2	6	.....	.....	.....
1	4	5	4	1	5	3	1	4	4	3	7	5	1	6	2	1	3
.....	9	9	1	6	7	1	13	14	5	6	11	2	10	12	332	9	341
5	.....	5	22	2	24	18	1	19	28	2	30	29	.....	29	15	.....	15
.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
155	.....	155	157	.....	157	240	.....	240	277	4	281	265	3	268	106	2	108
77	4	81	106	1	107	134	4	138	188	3	191	169	4	173	290	3	293
.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	1	.....	1	.....	.....	.....
33	.....	33	20	1	21	13	.....	13	14	.....	14	14	.....	14	11	.....	11
2	.....	2	2	.....	2	5	.....	5	2	1	3	12	.....	12	3	1	4
35	17	52	53	19	72	75	20	95	115	11	126	127	10	137	115	10	125
335	289	624	655	225	880	391	228	619	317	267	584	621	269	890	1,321	302	1,623
325	56	381	341	49	390	299	58	357	408	69	477	365	58	423	186	64	250
93	.....	93	83	.....	83	103	.....	103	139	.....	139	46	.....	46	36	.....	36
120	2	122	106	3	109	106	3	109	116	9	125	250	3	253	55	6	61
.....	.....	.....	3	.....	3	2	3	5	11	.....	11	4	.....	4	3	2	5
37	5	42	22	3	25	42	10	52	37	6	43	39	6	45	49	5	54
362	20	382	314	22	336	328	11	339	622	24	646	532	22	554	329	37	366
.....	.....	.....	.....	.....	.....	4	1	5	2	.....	2	1	5	6	.....	.....	.....
.....	.....	.....	.....	1	1	6	.....	6	1	.....	1	2	.....	2	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2	8	.....	8	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	3	9	.....	9	52	.....	52
5	16	21	3	20	23	5	17	22	9	17	26	7	24	31	7	22	29
.....	6	6	.....	2	2	.....	2	2	.....	11	11	.....	13	13	.....	4	4
.....	.....	.....	.....	.....	.....	1	.....	1	2	1	3	.....	.....	.....	1	.....	1
406	40	446	362	42	404	432	35	467	615	46	661	586	68	654	297	51	348
2	3	5	4	3	7	2	.....	2	1	2	3	1	2	3	1	3	4
52	5	57	33	4	37	65	2	67	77	11	88	102	2	104	20	8	28
60	25	85	84	13	97	79	19	98	120	22	142	134	14	148	134	47	181
586	15	601	418	8	426	855	15	870	1,356	13	1,369	1,837	19	1,856	1,509	16	1,525
26	3	29	29	.....	29	35	3	38	83	4	87	70	5	75	17	4	21
595	12	607	432	11	443	520	7	527	1,249	13	1,262	1,450	19	1,469	206	22	228
7	7	14	6	5	11	10	11	21	14	2	16	6	4	10	9	10	19
.....	.....	.....	.....	.....	.....	.....	1	1	3	.....	3	.....	.....	.....	.....	1	1
13	7	20	26	10	36	19	5	24	15	8	23	18	10	28	14	15	29
.....	1	1	.....	.....	.....	1	.....	1	1	.....	1	.....	.....	.....	.....	.....	.....
3,336	546	3,882	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
6,176	5,960	12,136	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

TABLE 8

Number of Arrivals via Ocean Ports, Classified by Port of Entry and Class, for the Fiscal Year ended March 31, 1940

Port of Entry	Number of Arrivals	Rejections	Admissions	Returned Canadians Absent More Than One Year				Other Persons Returning	Tourists, etc.
				Canadian Born	British Born Outside Canada	Canadians Naturalized	Aliens With Domicile		
Halifax	5,185	29	1,709	163	62	14	12	1,145	2,051
North Sydney	7,239	31	401	53	13	7	3	1,991	4,740
Sydney	122	11	12	9	2	.....	.....	39	49
Louisburg	355	.....	33	.....	.....	.....	.....	87	235
Charlottetown	40	.....	.....	6	3	.....	.....	17	14
Dalhousie	4	.....	.....	.....	.....	.....	.....	.....	4
Saint John	2,393	5	705	190	115	19	6	714	639
Montreal	1,435	27	137	95	46	4	1	641	484
Quebec	29,775	26	5,827	1,436	656	99	54	9,507	12,170
Three Rivers	9	.....	.....	4	3	.....	.....	.....	2
Shediac	1	.....	.....	.....	.....	.....	.....	1	.....
Boston	11	.....	11	.....	.....	.....	.....	.....	.....
New York	1,198	29	1,169	.....	.....	.....	.....	.....	.....
New Westminster	60	.....	13	2	2	.....	.....	16	27
Vancouver	4,061	6	253	286	53	29	36	968	2,430
Victoria	725	.....	53	44	10	4	.....	90	524
Not given	148	14	134	.....	.....	.....	.....	.....	.....
Totals	52,761	178	10,457	2,288	965	176	112	15,216	23,369

TABLE 9

Comparative Statement—Immigration to Canada via Ocean Ports, by Months, for the Fiscal Year 1939-40, Compared with that of the Preceding Fiscal Year

	1938-39				1939-40			
	M.	F.	C.	Totals	M.	F.	C.	Totals
April	357	483	604	1,444	489	608	559	1,656
May	238	401	419	1,058	520	621	549	1,690
June	242	469	449	1,160	503	617	570	1,690
July	263	473	470	1,206	375	515	554	1,444
August	197	388	426	1,011	363	507	463	1,333
September	306	560	594	1,460	248	325	228	801
October	308	504	503	1,315	149	219	116	484
November	118	271	224	613	106	152	76	334
December	101	236	224	561	76	122	78	276
January	64	164	137	365	68	66	36	170
February	86	190	163	439	72	103	73	248
March	223	321	289	833	96	144	91	331
Totals	2,503	4,460	4,502	11,465	3,065	3,999	3,393	10,457

TABLE 10

Comparative Statement—Immigration from the United States to Canada, by Months, for the Fiscal Year 1939-40, Compared with that of the Preceding Fiscal Year.

—	1938-39				1939-40			
	M.	F.	C.	Totals	M.	F.	C.	Totals
April	177	209	180	566	151	171	146	468
May	190	226	163	579	154	249	160	563
June	170	261	231	662	164	244	168	576
July	131	200	183	514	143	244	148	535
August	130	216	147	493	170	257	181	608
September	166	237	148	551	203	294	163	660
October	155	232	145	532	169	260	123	552
November	122	190	157	469	124	194	111	429
December	115	142	127	384	112	159	74	345
January	96	125	75	296	120	157	96	373
February	73	132	68	273	97	123	47	267
March	105	130	109	344	130	142	100	372
Totals	1,630	2,300	1,733	5,663	1,737	2,494	1,517	5,748

TABLE 11

Comparative Statement—Total Immigration to Canada, by Months, for the Fiscal Year 1939-40, Compared with that of the Preceding Fiscal Year

—	1938-39				1939-40			
	M.	F.	C.	Totals	M.	F.	C.	Totals
April	534	692	784	2,010	640	779	705	2,124
May	428	627	582	1,637	674	870	709	2,253
June	412	730	680	1,822	667	861	738	2,266
July	394	673	653	1,720	518	759	702	1,979
August	327	604	573	1,504	533	764	644	1,941
September	472	797	742	2,011	451	619	391	1,461
October	463	736	648	1,847	318	479	239	1,036
November	240	461	381	1,082	230	346	187	763
December	216	378	351	945	188	281	152	621
January	160	289	212	661	188	223	132	543
February	159	322	231	712	169	226	120	515
March	328	451	398	1,177	226	286	191	703
Totals	4,133	6,760	6,235	17,128	4,802	6,493	4,910	16,205

TABLE

Immigration via Ocean Ports, Showing Country of

Country of Birth	Totals	Bohemian	Moravian	Slovakian	Hebrew	English	Irish	Scotch	Welsh	Croatian	Serbian	Belgian	Bulgarian	Czech	Finnish	French	German	Greek
Aden	1																	
Africa (British)	35				3	22	2	5										
Africa (Not British)	1															1		
Albania	4																	
Arabia	1																1	
Argentina	10					5												
Atlantic Ocean Is. (Br.)	2					2												
Australia	55				2	42	2	4	2							1	1	
Atlantic Ocean Is. (Not Br.)	2					1	1											
Austria	85	3	1		32					1				5			41	
Barbados	8					5												
Bahamas	5					4												
Belgium	124				7	2						88				20	4	
Bermuda	6					3										1	1	
Brazil	3						1	2										
Bulgaria	12												12					
Canada	10					2									1	5		
Chile	1					1												
China	41				1	20	8	7									2	
Cuba	4					2		2										
Czecho-Slovakia	1,627	312	49	185	255					1				231		1	556	
Danzig	2				2													
Denmark	66				1													
Dutch East Indies	2					1												
Egypt	3					3												
Eire	112				1	7	102	1								1		
England	1,943		2	1	61	1,742	46	57	7			1	1	1		9	6	
Esthonia	3																	
Finland	56														56			
France	103				11	7	2	2				1		1		74	1	
Germany	629	9			397	4								11			198	
Greece	104												1					103
Guiana (British)	3					1		1										
Hawaiian Islands	4					1		1								2		
Holland	230				8							8				1	5	
Hong Kong	4				1	2		1										
Hungary	364	1		6	54									1			5	
India (British)	54				1	30	3	9										
Iraq	1																	
Ireland (Northern)	141					7	132	2										
Italy	194				4	2											4	1
Jamaica	16					9	2	2										
Japan	66					21		9										
Java	1																	
Jugo-Slavia	214			5	8	1				104	17						30	10
Korea	4					4												
Latvia	12				10													
Lesser British Isles	12					12												
Lithuania	94				42												2	
Luxemburg	1																1	
Mexico	56					6	1										10	
Newfoundland	487				1	388	52	16	2							24		
New Zealand	23					16	3	3								1		
Norway	37																	
Palestine	12				11													
Persia	4				1	3												
Peru	3					1		2										
Poland	2,351	7		1	322									39			105	
Porto Rico	1																	
Portugal	1					1												
Roumania	140			2	60								1				24	
Russia	37			2	15	1		1									1	
St. Pierre and Miquelon	3					3												
Scotland	537				4	20	9	501						1			1	
South America	13					12										1		
Spain	12					2		1									1	
Straits Settlements	5					4		1										
Sweden	12																	
Switzerland	70				4	1		1								4	16	1
Syria	11																	
Trinidad	7					3	1	3										
Turkey	2																1	
Ukraine	1																	
United States	69			4	2	36	6	5				2				4	2	
Venezuela	1																	
Wales	81					26	1	3	48							1	2	
West Indies (British)	4					1	1	1								1		
West Indies (Not British)	2																	
Totals	10,457	332	52	206	1,321	2,489	375	643	59	106	17	100	15	290	57	152	1,021	115

12

Birth by Racial Origin, for the Fiscal Year 1939-40

Dutch	Magyar	Italian	Jugo-Slavian	Polish	Roumanian	Russian	Danish	Norwegian	Swedish	Swiss	Ruthenian	Albanian	Esthonian	Lettish	Lithuanian	Portuguese	Spanish	Negro	Armenian	East Indian	Japanese	Persian	Syrian
						1																	
							2											1					
												4											
5																							
								1															
	2																	3					
1																							
2						1										1							
1			1																				
						2	1																
	13		13							2	9												
							65																
1																							
2				1		2	1	1		1			3						1				
		1	1	1				1															
1	3			2						4													
1																							
207											1												
	290		2								5									11			
																							1
		182		1														3					
1																					36		
	2		36		1																		
														2									
						2									48								
38																	1						
							1	1															2
								36	1														
																						1	
	2			290		114					1,471						1						
	16				19						18												
				1		12	1				2			1									
															1								
		1															7						
									12														
		1								42													11
																			1				
1	1	1	2	1							1 2												
1																							
2																							
264	329	186	55	297	20	134	71	40	13	49	1,509	4	3	3	49	1	9	7	2	11	36	1	14

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	Czech	Finnish
Africa (British)	5			1	1	1									
Argentina	2				2										
Armenia	1														
Atlantic Ocean Is. (not Br.)	1														
Australia	11				7	3	1								
Austria	6			3											
Barbados	2				1										
Bahamas	2				2										
Belgium	15												12		
Bermuda	4				2			1							
Canada	532			8	181	90	102	4					1		2
Central America	1						1								
Chile	1						1								
China	3				1		1								
Czecho-Slovakia	13		6	4										1	
Denmark	6														
Egypt	3				1		1								
Eire	31				2	29									
England	356			8	328	5	12	2							
Esthonia	1														
Finland	4														3
France	24			1	1										
Germany	59		1	15	1										
Greece	6				1										
Holland	7														
Hungary	20			5										1	
India (British)	9				4	2	2								
Ireland (Northern)	27					24	3								
Italy	24														
Jamaica	1				1										
Japan	1				1										
Jugo-Slavia	6		1								1				
Latvia	2														
Lesser British Isles	2				2										
Lithuania	2			2											
Mexico	2				1										
Newfoundland	29				25	4									
New Zealand	3				2		1								
Norway	19														
Palestine	2			2											
Poland	30		1	18											
Porto Rico	3				1		1								
Roumania	11			6											
Russia	59			32											
Scotland	135			1	8	1	125								
Siam	1				1										
South America	1									1					
Spain	3														
Sweden	15														
Switzerland	11			4			1								
Syria	6														
Trinidad	2														
Turkey	2			1											
United States	4,202	9	13	191	1,297	551	449	54	4		1	4	10	1	15
Venezuela	1						1								
Wales	19				4			14							
West Indies (British)	1														
Born at sea	1														
Totals	5,748	9	22	302	1,878	710	702	75	4	1	2	4	23	3	20

13

of Birth by Racial Origin, for the Fiscal Year 1939-40

French	German	Greek	Dutch	Magyar	Italian	Jugo-Slavian	Polish	Roumanian	Russian	Danish	Icelandic	Norwegian	Swedish	Swiss	Ruthenian	Esthonian	Lettish	Lithuanian	Portuguese	Spanish	Negro	Armenian	Syrian
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	2	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
112	15	.....	10	.....	1	.....	.....	.....	.....	.....	.....	1	1	.....	2	.....	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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.....	1	.....	.....	.....	.....	1	.....	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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19	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....
.....	40	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	23	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	.....	.....	.....	.....	.....	8	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	.....	.....	2	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
.....	7	.....	2	.....	.....	.....	.....	.....	17	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
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.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	6
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
656	438	4	126	18	39	2	42	5	28	33	4	69	62	27	11	1	1	4	3	4	18	.....	8
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
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794	510	10	147	37	64	6	51	8	47	39	4	89	80	32	16	1	2	5	3	10	22	1	15

TABLE

Total Immigration to Canada, Showing Country of

Country of Birth	Totals	Bohemian	Moravian	Slovakian	Hebrew	English	Irish	Scotch	Welsh	N.A. Indian	Spanish Am.	Croatian	Serbian	Belgian	Bulgarian	Czech	Finnish	French	German	Greek
Aden	1																			
Africa (British)	40				4	23	3	5											1	
Africa (not British)	1																	1		
Albania	4																			
Arabia	1																		1	
Argentina	12					7														
Armenia	1																			
Atlantic Ocean Is. (Br.)	2					2														
Australia	66				2	49	5	5	2									1	1	
Atlantic O. Is. (not Br.)	3					1	1													
Austria	91	3	1		35							1				5			43	
Barbados	10					6														
Bahamas	7					6														
Belgium	139				7	2								100				23	4	
Bermuda	10					5			1									1	1	
Brazil	3						1	2												
Bulgaria	12														12					
Canada	542				8	183	90	102	4					1			3	117	15	
Central America	1							1												
Chile	2					1		1											2	
China	44				1	21	8	8												
Cuba	4					2		2												
Czecho-Slovakia	1,640	312	49	191	259							1				232		1	557	
Danzig	2				2															
Denmark	72				1															
Dutch East Indies	2					1														
Egypt	6					4		1										1		
Eire	143				1	9	131	1										1		
England	2,299		2	1	69	2,070	51	69	9					1	1	1		10	6	
Esthonia	4																			
Finland	60																59			
France	127				12	8	2	2						1		1		93	1	
Germany	688	9		1	412	5										11			238	
Greece	110					1									1					108
Guiana (British)	3					1		1												
Hawaiian Islands	4					1		1										2		
Holland	237				8									8				1	5	
Hong Kong	4				1	2		1												
Hungary	384	1		6	59											2			5	
India	63				1	34	5	11											1	
Iraq	1																			
Ireland (Northern)	168					7	156	5												
Italy	218				4	2													4	1
Jamaica	17					10	2	2												
Japan	67					22		9												
Java	1																			
Jugo-Slavia	220			6	8	1						105	17						30	10
Korea	4					4														
Latvia	14				10														1	
Lesser British Isles	14					14														
Lithuania	96				44														2	
Luxemburg	1																		1	
Mexico	58					7	1												10	
Newfoundland	516				1	413	56	16	2									24		
New Zealand	26					18	3	4										1		
Norway	56																			
Palestine	14				13															
Persia	4				1	3														
Peru	3					1		2												
Poland	2,381	7		2	340											39			106	
Porto Rico	4					1		1										1		
Portugal	1					1														
Roumania	151			2	66										1				24	
Russia	96			2	47	1		1											8	
St. Pierre and Miquelon	3					3														
Scotland	672				5	28	10	626								1			1	
Siam	1					1														
Spain	15					2		1											1	
South America	14					12					1							1		
Straits Settlements	5					4		1												
Sweden	27																			
Switzerland	81				8	1		2										5	17	1
Syria	17																			
Trinidad	9					3	1	3											1	
Turkey	4				1														1	1
Ukraine	1																			
United States	4,271	9		17	193	1,333	557	454	54	4		1	4	12		1	15	660	440	4
Venezuela	2							1												
Wales	100					30	1	3	62									1	2	
West Indies (British)	5					1	1	1										1		
West Indies (not Br.)	2																			
Born at sea	1																		1	
Totals	16,205	341	52	228	1,623	4,367	1,085	1,345	134	4	1	108	21	123	15	293	77	946	1,531	125

. 14

Birth by Racial Origin, for the Fiscal Year 1939-40

Dutch	Magyar	Italian	Jugo-Slavian	Polish	Roumanian	Russian	Danish	Icelandic	Norwegian	Swedish	Swiss	Ruthenian	Albanian	Esthonian	Lettish	Lithuanian	Portuguese	Spanish	Negro	Armenian	East Indian	Japanese	Persian	Syrian
....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	2	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....
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....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
2	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
11	....	1	1	....	....	....	....	....	1	1	....	2	....	....	....	....	....	....	1	....	....	....	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1	....	....	....	....	....	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	13	....	14	....	....	....	....	....	....	....	2	9	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	71	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
2	....	....	....	1	....	2	1	....	1	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....
....	....	....	....	....	....	1	....	....	....	1	....	....	....	3	....	....	....	....	....	....	....	....	....	....
....	....	2	1	1	....	....	....	....	1	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....
1	4	....	....	3	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....	....	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
214	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
....	304	....	2	....	....	....	....	....	....	....	....	5	....	....	....	....	....	....	....	....	11	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
....	....	205	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	36	....	....
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	3	....	39	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	48	....	....	....	....	....	....	....	....
39	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	2
....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	55	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	2	....	....	298	....	114	....	....	....	....	....	1,473	....	....	....	....	....	1	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	18	....	....	....	21	....	....	....	....	....	....	19	....	....	....	....	....	....	....	....	....	....	....	....
2	....	....	....	1	....	29	1	....	....	....	....	2	....	....	1	1	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	27	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	1	....	....	....	....	....	....	....	....	46	....	....	....	....	....	....	....	....	....	....	....	....	17
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....
127	19	40	4	43	5	28	33	4	69	62	27	1 13	....	1	1	4	3	4	18	....	....	....	....	8
1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
411	366	250	61	348	28	181	110	4	129	93	81	1,525	4	4	5	54	4	19	29	3	11	36	1	29

TABLE 15

Immigration via Ocean Ports, Showing Destination by Intended Occupation and Sex, for the Fiscal Year ended March 31, 1940

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	536	22	14	12	13	111	5	2	1	18	9	2	1	14	6	1	....	.....	....	.....	....	120	25	33	68	27	32
New Brunswick	43	3	1	2	1	1	....	.....	....	2	....	.....	..	1	....	.....	....	.....	....	.....	....	5	.....	4	15	2	6
Prince Edward Island	5	.....	.....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	1	....	.....	....	.....	....	.....	.....	1	2	1	.....
Quebec	1,950	178	106	82	56	56	10	12	3	105	39	15	7	153	95	29	32	3	....	.....	....	127	8	185	417	120	112
Ontario	3,145	284	152	161	83	45	11	12	3	154	79	26	21	114	87	22	32	7	3	2	....	177	30	179	796	345	320
Manitoba	1,037	229	151	192	137	3	1	.....	1	8	3	.....	1	10	5	4	2	.....	....	.....	....	32	16	36	115	48	43
Saskatchewan	1,041	304	223	168	148	1	....	.....	....	1	1	.....	....	.....	3	1	....	.....	....	.....	....	17	8	29	77	28	32
Alberta	1,171	240	189	242	173	.....	....	1	1	4	1	.....	....	7	3	.....	....	1	....	.....	....	21	14	16	162	54	42
British Columbia	1,519	263	176	90	82	13	4	5	2	25	16	3	4	51	42	10	9	2	....	.....	....	51	11	140	361	76	83
Yukon Territory	1	1	.....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....	.....	.....	.....	.....
Northwest Territories	9	.....	.....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....	8	1	.....	.....
Totals	10,457	1,524	1,012	949	693	230	31	32	11	317	148	46	34	350	241	68	75	13	3	2	....	550	112	631	2,014	701	670

TABLE 16

Immigration from the United States to Canada, Showing Destination by Intended Occupation and Sex, for the Fiscal Year ended March 31, 1940

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	300	19	9	9	1	8	3	1	....	12	2	1	1	13	7	.....	2	1	1	.....	....	6	.....	32	86	37	49
New Brunswick	307	29	10	9	6	9	3	.....	....	2	....	.....	....	5	4	1	....	.....	....	.....	....	5	.....	19	91	69	45
Prince Edward Island	63	10	5	3	1	.....	....	.....	....	.....	....	.....	....	2	....	.....	....	.....	....	.....	....	1	.....	5	21	6	9
Quebec	1,303	35	12	8	5	30	4	5	5	88	31	9	8	95	46	13	8	2	....	.....	....	23	2	153	475	129	117
Ontario	2,404	80	34	22	21	44	11	8	6	182	76	25	29	176	92	22	20	11	1	.....	....	42	1	218	801	249	233
Manitoba	198	19	10	11	11	2	1	.....	1	5	1	1	1	9	5	1	1	.....	1	.....	....	2	.....	13	63	19	21
Saskatchewan	173	39	16	7	3	1	....	.....	....	3	2	.....	....	7	3	.....	1	.....	....	.....	....	4	1	16	47	14	9
Alberta	396	71	29	16	13	3	2	.....	....	15	8	5	2	9	2	.....	....	.....	....	.....	....	9	.....	34	119	31	28
British Columbia	601	25	12	8	7	15	5	3	1	19	15	3	2	44	24	1	2	11	2	.....	....	10	.....	96	200	54	42
Yukon Territory	3	1	.....	1	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....	.....	.....	1	.....
Totals	5,748	328	137	94	68	112	29	17	13	326	135	44	43	360	183	38	34	25	5	.....	....	102	4	586	1,903	609	553

TABLE 17

Total Immigration, Showing Destination by Intended Occupation and Sex, for the Fiscal Year ended March 31, 1940

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	836	41	23	21	14	119	8	3	1	30	11	3	2	27	13	1	2	1	1	.....	....	126	25	65	154	64	81
New Brunswick	350	32	11	11	7	10	3	.....	....	4	....	.....	....	6	4	1	....	.....	....	.....	....	10	.....	23	106	71	51
Prince Edward Island	68	10	5	3	1	.....	....	.....	....	.....	....	.....	....	2	....	1	....	.....	....	.....	....	1	.....	6	23	7	9
Quebec	3,253	213	118	90	61	86	14	17	8	193	70	24	15	248	141	42	40	5	....	.....	....	150	10	338	892	249	229
Ontario	5,549	364	186	183	104	89	22	20	9	336	155	51	50	290	179	44	52	18	4	2	....	219	31	397	1,597	594	553
Manitoba	1,235	248	161	203	148	5	2	.....	2	13	4	1	2	19	10	5	3	.....	1	.....	....	34	16	49	178	67	64
Saskatchewan	1,214	343	239	175	151	2	....	.....	....	4	3	.....	....	7	6	1	1	.....	....	.....	....	21	9	45	124	42	41
Alberta	1,567	311	218	258	186	3	2	1	1	19	9	5	2	16	5	.....	....	1	....	.....	....	30	14	50	281	85	70
British Columbia	2,120	288	188	98	89	28	9	8	3	44	31	6	6	95	66	11	11	13	2	.....	....	61	11	236	561	130	125
Yukon Territory	4	2	.....	1	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....	.....	.....	1	.....
Northwest Territories	9	.....	.....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	.....	8	1	.....	.....
Totals	16,205	1,852	1,149	1,043	761	342	60	49	24	643	283	90	77	710	424	106	109	38	8	2	....	652	116	1,217	3,917	1,310	1,223

TABLE 18

Immigration, Showing Nationality and Sex, for the Fiscal Year ended March 31, 1940

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.	
Albanian	2	1	1								2
Armenian						1	1				1
Belgian	108	44	37	11	16	5	1	3	1		113
British	3,962	1,303	1,769	460	430	1,234	356	657	111	110	5,196
Bulgarian	11		8		3						11
Central American	9	3	2	3	1						9
Czecho-Slovakian	1,787	629	604	282	272	8	3	4	1		1,795
Danish	59	28	25	3	3	1	1				60
Danzig	11	2	3	3	3						11
Dutch	249	73	68	60	48	1	1				250
Esthonian	2	1	1								2
Finnish	54	4	37	5	8						54
French	78	26	33	12	7	11	4	5	1	1	89
German	548	195	235	70	48	37	15	14	3	5	585
Greek	101	6	37	35	23	4	4				105
Hungarian	360	56	157	76	71	14	6	6	1	1	374
Italian	164	18	60	51	35	11	9	2			175
Japanese	21	1	17	1	2						21
Jugo-Slavian	211	11	92	64	44	3	2	1			214
Latvian	7	2	3		2						7
Lithuanian	96	33	32	14	17						96
Mexican	1				1						1
Norwegian	29	17	8	1	3						29
Persian	1	1									1
Polish	2,301	517	664	606	514	8	4	4			2,309
Roumanian	147	41	55	26	25	7	3	2	2		154
Russian	6	5	1			6	3	3			12
Spanish	10	3	3		4	3	2	1			13
Swedish	10	3	5	2		3	1	2			13
Swiss	73	27	27	11	8	7	1	6			80
Syrian	4	2	1		1	1	1				5
Turkish	1		1								1
Ukrainian	2	1	1								2
U.S.A. Citizens	28	11	10	2	5	4,383	1,319	1,784	682	598	4,411
West Indian (not British)	4	1	2		1						4
Totals	10,457	3,065	3,999	1,798	1,595	5,748	1,737	2,494	802	715	16,205

TABLE 19

Immigration from the United States, Showing State of Last Residence, by Intended Occupation and Sex, for the Fiscal Year 1939-40

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							3		
Alaska									1								1						1	6	1	2
Arizona																					1					
Arkansas									1												1		1	3		
California	18	10	10	5	5	1		1	18	8	7	2	27	16	2	3	3				8		55	119	47	15
Colorado	2	1					1		1				2	1	2	1								7		2
Connecticut	6	3		1	1		2		3	3	2	1	5	3			1	1			2		14	34	18	17
Delaware									2	2													1	4	1	2
District of Columbia	1				1			1	2	2			1								1		3	6	1	1
Florida	2	3	2	1					3				1										6	16		6
Georgia									1	1													2	1	4	3
Hawaii	1																									
Idaho	4	3	6	5					1	2													3	10	2	5
Illinois	7	7	7	3	4	2		3	6	3	1		17	8	3	1	1						23	90	12	14
Indiana	2	1							2	1	1	1	1	2		2					2		6	14	5	5
Iowa	6	1	2	2									1	1									7	14	7	4
Kansas	1	2	1		2	1	1		1	1											2		6	10	7	2
Kentucky	1	1	1	1					1	1			1										3	8	1	3
Louisiana													2	1		2							3	2	2	
Maine	19	6	6	2	7	1			5	2	1	2	7	4	2						1	1	14	81	52	42
Maryland									4			1	2										7	11	6	8
Massachusetts	38	18	9	5	12	3	1		27	8	6		25	16	1	3					10	2	62	195	56	57
Michigan	43	16	6	16	12	3	1		74	26	5	9	51	33	4	4	1	1			13		55	249	96	98
Minnesota	15	3	1	2	1				2	3			14	7	2	1	1	2			2		15	58	11	10
Mississippi																								2		
Missouri	2	2			1	1			1				2	1	1	1							5	14	4	2
Montana	5	3	1	2		1			2	1		1	1	2		1	1				2		3	14	8	6
Nebraska	6	5	2											1							2		2	11	5	4

Nevada																								1			
New Hampshire	5	1	4		3	1			3	3			4	1									10	38	12	6	
New Jersey									13	5	1	4	9	5	4	1					1		33	45	13	14	
New Mexico	1																							1		1	
New York	38	10	7	4	35	5	5	5	80	26	11	7	113	45	11	9	5				32		111	382	103	85	
North Carolina	4	1	1	2					1				2								2		2	5	1	1	
North Dakota	10	2	9	6	1				2	1											1	1	4	29	4	5	
Ohio	7	2	3		4				25	14	5	13	13	6	2	1	1				2		24	68	28	19	
Oklahoma	1	1	1						1	1			1	1							1		2	6		2	
Oregon	22	8	3	1	2	1	2		4	2	1		5	4	1	1	2	1			2		19	31	12	2	
Pennsylvania	5	4	3	3	2	1			7	7	1		12	5	1	1	1				2		17	59	10	20	
Rhode Island	4	3	1	2					5	2			5	1		1							7	23	5	8	
South Carolina													1								1		2	6		1	
South Dakota	5	2	1						1				1										2	7	2		
Tennessee	1	1	1						1	1			1										1	2		1	
Texas	2			2		1			2				2	1	1						1		7	14	2	6	
Utah																	1						2	8		1	
Vermont	6	2	3		5	2	3	2	5	1		1	2	4	1		1				1		5	43	21	22	
Virginia	5	3	1	2					2	1				1							1		3	7	4	2	
Washington	20	10	2	1	10	4	1		8	5	2	1	20	11		1	4				5		26	94	32	41	
West Virginia													1											4	2		
Wisconsin	6								2				5	1							1		5	16	4	2	
Wyoming	2	1			1				2	1													1	1			
Not given	5	1			3	1		1	4	1			3	1							2		6	31	8	6	
Totals	328	137	94	68	112	29	17	13	326	135	44	43	360	183	38	34	25	5			102	4	586	1,903	609	553	

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
Albanian	1	3			4				1					
Armenian		1	1		2									
Belgian	35	41	9	15	100	26	15	14	1			2	2	
Bohemian	116	107	59	50	332	114	97	103	1	1	2			
British—														
English	850	1,091	287	261	2,489	131	52	80	139	13	19	156	73	42
Irish	150	160	34	31	375	46	8	5	21		3	18	11	3
Scotch	203	311	62	67	643	36	9	5	20	5	3	53	24	15
Welsh	16	36	4	3	59	3	2	1	2	1		2	2	2
Bulgarian	2	10		3	15									
Croatian	1	50	32	23	106	1		2			1		1	2
Czech	99	100	55	36	290	59	48	49	2	1	2	8	6	7
Dutch	64	58	81	61	264	55	36	108	1		1			
East Indian	2	4	5		11				2	1	1			
Esthonian	1	2			3							1		
Finnish	6	37	5	9	57	3	1	2			1	1		
French	50	66	19	17	152	8	4	3	9	1	1	7	3	1
German	353	342	172	154	1,021	313	217	260	1	1		3	3	1
Greek	6	44	40	25	115				1			1	1	
Hebrew	473	491	174	183	1,321	204	150	186	11	5	6	42	17	2
Italian	21	74	54	37	186	1	1	2	7			4		1
Japanese	1	31	1	3	36		1							
Jugo-Slavian		28	15	12	55			2						
Lettish	2	1			3				1					
Lithuanian	13	16	10	10	49	10	7	17						
Magyar	46	142	71	70	329	22	6	21	3	2	2	4	2	1
Moravian	19	16	5	12	52	16	13	14				2		1
Negro	3	2	1	1	7	1						1		
Persian	1				1									
Polish	55	98	82	62	297	43	29	75				5		2
Portuguese		1			1									
Roumanian	5	8	5	2	20	3		1						
Russian	31	36	37	30	134	28	17	48				1		
Ruthenian	330	425	401	353	1,509	323	269	599						
Scandinavian—														
Danish	30	30	7	4	71	27	4	2				1	1	
Norwegian	20	14	2	4	40	10	2	3	6			1		
Swedish	4	6	2	1	13	1								
Serbian	2	8	5	2	17	2	2	4						
Slovakian	29	85	51	41	206	23	15	21	1		1	3	1	
Spanish	2	3		4	9									
Swiss	20	15	7	7	49	13	6	12				1	1	
Syrian	3	6	3	2	14	2	1	3						
Totals	3,065	3,999	1,798	1,595	10,457	1,524	1,012	1,642	230	31	43	317	148	80

20

at Ocean Ports, for the Fiscal Year ended March 31, 1940

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
.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	1	3	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....
.....	3	.....	.....	.....	.....	2	1	6	19	9	.....	.....	.....	36	61	3	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	5	3	1	4	1	.....	.....	.....	28	11	6	166	.....	121	.....	.....
128	83	26	7	2	.....	246	29	289	622	352	357	16	3	445	881	92	67	92	536	.....	.....
14	14	3	2	.....	.....	46	2	49	81	49	44	5	.....	61	166	15	14	14	55	1	.....
32	28	10	1	.....	1	86	2	61	159	93	37	7	1	112	302	36	11	27	109	.....	1
3	3	.....	.....	.....	.....	7	1	6	21	3	1	1	.....	6	30	4	2	3	12	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	2	10	3	.....	1	.....	2	10	.....	.....	.....	2	.....	.....
.....	.....	.....	.....	.....	.....	1	3	.....	48	47	.....	.....	.....	9	61	9	.....	6	21	.....	.....
16	9	13	.....	.....	.....	4	3	14	32	17	.....	.....	.....	92	74	26	32	3	63	.....	.....
3	2	2	.....	.....	.....	5	3	5	15	28	11	2	.....	20	80	101	.....	36	14	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	3	4	.....	.....	.....	.....	.....	.....	.....	.....	11	.....	.....
.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	.....	.....	1	1	.....	.....	.....	1	.....	.....
.....	.....	.....	.....	.....	.....	29	.....	2	7	11	.....	.....	.....	26	26	.....	3	.....	2	.....	.....
5	4	1	.....	.....	.....	12	1	21	42	29	22	3	.....	90	9	6	4	8	4	.....	6
11	8	6	.....	.....	.....	18	7	25	95	52	4	.....	.....	109	118	53	331	78	328	.....	.....
1	.....	.....	.....	.....	.....	1	2	3	42	63	2	1	.....	8	102	2	.....	.....	.....	.....	.....
112	73	76	.....	.....	.....	31	5	104	215	82	34	6	.....	589	398	186	42	10	56	.....	.....
5	1	.....	.....	.....	.....	3	1	4	69	87	.....	.....	.....	42	114	2	.....	9	19	.....	.....
1	.....	.....	.....	.....	.....	.....	.....	.....	30	4	.....	.....	.....	.....	1	.....	.....	.....	35	.....	.....
.....	.....	.....	.....	.....	.....	.....	1	.....	28	24	.....	.....	.....	8	35	.....	2	7	3	.....	.....
.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	2	.....	.....	.....	.....	.....	.....
1	1	.....	1	.....	.....	2	1	1	6	2	.....	.....	.....	20	20	.....	.....	9	.....	.....	.....
7	3	1	.....	.....	.....	4	6	10	125	110	.....	1	.....	52	184	7	14	56	15	.....	.....
.....	.....	.....	.....	.....	.....	1	1	1	2	1	.....	.....	.....	.....	1	.....	9	1	41	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	1	2	2	1	.....	.....	3	2	.....	.....	.....	1	.....	.....
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
1	1	.....	.....	.....	.....	2	4	6	66	63	1	.....	.....	43	91	49	27	76	8	.....	2
.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
1	.....	.....	.....	.....	.....	2	1	1	6	5	.....	.....	.....	1	16	.....	1	2	.....	.....	.....
1	1	1	.....	.....	.....	2	2	1	16	16	.....	.....	.....	7	11	33	27	34	22	.....	.....
.....	.....	2	1	1	1	19	27	6	136	125	.....	.....	.....	34	184	348	267	663	13	.....	.....
1	2	.....	.....	.....	.....	13	2	1	10	7	5	.....	.....	32	11	6	8	5	4	.....	.....
.....	.....	.....	.....	.....	.....	2	.....	3	10	3	1	.....	.....	7	3	13	.....	7	9	.....	.....
2	1	1	.....	.....	.....	2	.....	1	3	2	1	.....	.....	4	2	2	1	1	2	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	6	3	3	.....	.....	2	5	.....	.....	6	1	.....	.....
.....	1	.....	.....	.....	.....	3	4	2	65	66	5	.....	.....	26	109	32	11	17	6	.....	.....
1	2	.....	1	.....	.....	.....	.....	.....	1	4	.....	.....	.....	1	6	.....	.....	.....	2	.....	.....
2	.....	.....	.....	.....	.....	.....	.....	4	8	2	.....	.....	.....	29	10	6	1	1	2	.....	.....
1	.....	1	.....	.....	.....	.....	.....	.....	5	1	7	.....	1	3	2	.....	1	.....	.....	.....	.....
350	241	143	13	3	2	550	112	631	2,014	1,371	536	43	5	1,950	3,145	1,037	1,041	1,171	1,519	1	9

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									
Belgian	9	9	1	4	23	3	1	5				5	1	
Bohemian	4	4	1		9	3	1							
British—														
English	564	782	277	255	1,878	91	46	57	31	8	7	115	39	36
Irish	205	308	103	94	710	40	22	16	22	3	2	33	23	15
Scotch	212	292	101	97	702	48	17	27	14	5	4	51	18	15
Welsh	30	26	8	11	75	2		2	1	1		9	4	5
Croatian		2			2									
Czech	2	1			3									
Dutch	46	71	19	11	147	8	5	1	2	1		9	5	4
Esthonian	1				1	1								
Finnish	4	15		1	20							1	1	
French	206	355	126	107	794	47	15	22	17	5	10	36	14	1
German	158	250	53	49	510	45	18	20	7	2	1	17	13	1
Greek	8	2			10							1		
Hebrew	106	129	44	23	302	1	1		6	2	3	18	6	3
Italian	29	26	6	3	64		1		4		2	10	2	1
Jugo-Slavian	2	4			6	1								
Lettish		1		1	2									
Lithuanian	2	3			5								1	
Magyar	13	16	5	3	37	4	1		2	1	1	2		
Negro	6	9	3	4	22				2				1	
North American Indian	1		2	1	4									
Polish	18	26	4	3	51	3						5	2	2
Portuguese		2		1	3									
Roumanian	2	5	1		8				1					
Russian	17	14	9	7	47	8	3	3					1	
Ruthenian	3	10		3	16							1		
Scandinavian—														
Danish	12	13	6	8	39	6		2				4		4
Icelandic	1		2	1	4	1								
Norwegian	29	41	11	8	89	7	3	1	1			1	1	
Swedish	21	35	13	11	80	4	2	6	1	1		3	1	
Serbian		3		1	4		1							
Slovakian	7	12	2	1	22	3								
Spanish	4	4	1	1	10							2	1	
Spanish American		1			1									
Swiss	12	12	3	5	32	3			1			4	1	
Syrian	2	11	1	1	15							1		
Totals	1,737	2,494	802	715	5,748	329	137	162	112	29	30	328	135	87

21

from the United States, for Fiscal Year ended March 31, 1940

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
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
....	....	....	....	....	....	....	....	1	7	....	....	....	....	2	14	3	1	....	3	....
1	1	....	....	....	....	....	....	....	2	1	....	....	....	1	4	....	3	1	....	....
118	73	21	8	1	....	29	....	201	586	411	130	137	20	282	879	44	41	110	235	....
38	22	8	1	....	....	20	1	71	218	155	34	44	13	103	348	17	29	43	79	....
38	26	8	4	1	....	14	....	57	211	144	59	42	23	90	296	29	14	53	96	....
8	3	4	1	....	....	1	....	9	17	8	2	3	3	5	40	1	1	5	15	....
....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	2	....	....	....	....	....
1	....	....	....	....	....	....	....	1	1	....	....	....	....	1	....	1	....	1	....	....
12	7	2	1	....	....	2	1	14	51	22	2	2	2	18	74	16	5	12	16	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
2	1	....	....	....	....	....	....	1	13	1	1	....	....	3	11	....	....	4	1	....
32	22	3	1	1	....	14	2	73	284	195	18	56	1	517	147	4	6	15	30	....
27	13	12	4	1	....	8	....	58	195	68	18	7	1	58	244	31	23	69	57	2
4	....	....	....	....	....	....	....	3	2	....	3	....	....	2	3	....	....	....	2	....
55	7	7	3	....	....	3	....	23	110	54	22	1	....	116	118	19	6	11	9	....
8	1	1	....	....	....	1	....	7	21	5	1	....	....	20	38	....	....	....	5	....
....	....	....	1	....	....	....	....	....	4	....	....	....	....	....	4	....	1	....	1	....
....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	2	....	....	....	....	....
....	....	....	....	....	....	....	....	2	2	....	....	....	....	....	4	....	....	1	....	....
1	1	2	....	....	....	1	....	4	12	5	2	1	....	6	20	4	1	1	1	1
1	....	....	....	....	....	2	....	3	6	7	3	....	....	6	13	....	....	....	....	....
....	....	....	....	....	....	....	....	1	....	3	....	....	....	....	1	....	....	1	2	....
2	1	....	....	....	....	2	....	8	21	5	....	....	....	13	34	2	1	1	....	....
....	....	....	....	....	....	....	....	....	2	1	1	....	....	....	....	....	....	1	1	....
....	....	....	....	....	....	....	....	1	5	1	....	....	....	1	3	....	....	3	1	....
....	1	....	....	....	....	1	....	9	8	13	1	....	....	6	12	3	4	10	11	....
....	....	....	....	....	....	....	....	2	10	3	....	....	....	4	7	2	2	1	....	....
....	....	....	....	....	....	....	....	2	13	8	....	10	....	7	5	....	1	14	2	....
....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	4	....	....	....	....
4	....	2	1	....	....	2	....	15	35	16	....	1	....	8	15	5	22	24	14	....
5	3	2	....	1	....	1	....	8	26	16	2	2	....	9	30	11	7	8	11	....
....	....	....	....	....	....	....	....	....	2	1	....	....	....	....	4	....	....	....	....	....
1	....	....	....	....	....	....	....	3	12	3	1	....	....	5	11	....	2	1	2	....
....	....	....	....	....	....	....	....	2	3	2	....	....	....	6	4	....	....	....	....	....
....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....
1	....	....	....	....	....	1	....	3	10	8	....	1	....	8	7	2	2	5	7	....
....	1	....	....	....	....	....	....	1	10	2	....	....	....	5	9	....	1	....	....	....
360	183	72	25	5	....	102	4	583	1,903	1,162	300	307	63	1,303	2,404	198	173	396	601	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			Mechanics		
	Males	Females	Males	Females		Males	Females	Children	Males	Females	Children	Males	Females	Children
Albanian	1	3			4				1					
Armenian	1	1	1		3									
Belgian	44	50	10	19	123	29	16	19	1			7	3	
Bohemian	120	111	60	50	341	117	98	103	1	1	2			
British—														
English	1,414	1,873	564	516	4,367	222	98	137	170	21	26	271	112	78
Irish	355	468	137	125	1,085	86	30	21	43	3	5	51	34	18
Scotch	415	603	163	164	1,345	84	26	32	34	10	7	104	42	30
Welsh	46	62	12	14	134	5	2	3	3	2		11	6	7
Bulgarian	2	10		3	15									
Croatian	1	52	32	23	108	1		2			1		1	2
Czech	101	101	55	36	293	59	48	49	2	1	2	8	6	7
Dutch	110	129	100	72	411	63	41	109	3	1	1	9	5	4
East Indian	2	4	5		11				2	1	1			
Esthonian	2	2			4	1						1		
Finnish	10	52	5	10	77	3	1	2			1	2	1	
French	256	421	145	124	946	55	19	25	26	6	11	43	17	2
German	511	592	225	203	1,531	358	235	280	8	3	1	20	16	2
Greek	14	46	40	25	125				1			2	1	
Hebrew	579	620	218	206	1,623	205	151	186	17	7	9	60	23	5
Italian	50	100	60	40	250	1	2	2	11		2	14	2	2
Japanese	1	31	1	3	36		1							
Jugo-Slavian	2	32	15	12	61	1		2						
Lettish	2	2		1	5				1					
Lithuanian	15	19	10	10	54	10	7	17					1	
Magyar	59	158	76	73	366	26	7	21	5	3	3	6	2	1
Moravian	19	16	5	12	52	16	13	14				2		1
Negro	9	11	4	5	29	1			2			1	1	
North American Indian	1		2	1	4									
Persian	1				1									
Polish	73	124	86	65	348	46	29	75				10	2	4
Portuguese		3		1	4									
Roumanian	7	13	6	2	28	3		1	1					
Russian	48	50	46	37	181	36	20	51				1	1	
Ruthenian	333	435	401	356	1,525	323	269	599				1		
Scandinavian—														
Danish	42	43	13	12	110	33	4	4				5	1	4
Icelandic	1		2	1	4	1								
Norwegian	49	55	13	12	129	17	5	4	7			2	1	
Swedish	25	41	15	12	93	5	2	6	1	1		3	1	
Serbian	2	11	5	3	21	2	3	4						
Slovakian	36	97	53	42	228	26	15	21	1		1	3	1	
Spanish	6	7	1	5	19							2	1	
Spanish American		1			1									
Swiss	32	27	10	12	81	16	6	12	1			5	2	
Syrian	5	17	4	3	29	2	1	3				1		
Totals	4,802	6,493	2,600	2,310	16,205	1,853	1,149	1,804	342	60	73	645	283	167

22

Arrivals, for the Fiscal Year ended March 31 1940

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
..	....	....	....	....	....	....	....	.....	3	.....	....	....	....	1	3	.....	.....	.....	.....	....	.....
1	....	....	....	....	....	1	....	.....	.....	1	....	....	....	....	2	.....	.....	.....	1	....	.....
.....	3	....	....	....	....	2	1	7	26	9	....	....	....	38	75	6	1	.....	3	....	.....
1	1	....	....	....	....	5	3	1	6	2	....	....	....	29	15	6	169	1	121	....	.....
246	156	47	15	3	....	275	29	490	1,208	763	487	153	23	727	1,760	136	108	202	771	....	.....
52	36	11	3	....	....	66	3	120	299	204	78	49	13	164	514	32	43	57	134	1	
70	54	18	5	1	1	100	2	118	370	237	96	49	24	202	598	65	25	80	205	....	1
11	6	4	1	....	....	8	1	15	38	11	3	4	3	11	70	5	3	8	27	....	.....
.....	....	....	....	....	....	....	....	2	10	3	....	1	....	2	10	.....	.....	.....	2	....	.....
.....	....	....	....	....	....	1	3	.....	50	47	....	....	....	9	63	9	.....	6	21	....	.....
17	9	13	....	....	....	4	3	15	33	17	....	....	....	93	74	27	32	4	63	....	.....
15	9	4	1	....	....	7	4	19	66	50	13	4	2	38	154	117	5	48	30	....	.....
.....	....	....	....	....	....	....	....	.....	3	4	....	....	....	....	....	....	....	.....	11	....	.....
.....	....	....	....	....	....	1	....	.....	1	....	....	....	....	1	1	.....	.....	1	1	....	.....
2	1	....	....	....	....	29	....	3	20	12	1	....	....	29	37	.....	3	4	3	....	.....
37	26	4	1	1	....	26	3	94	326	224	40	59	1	607	156	10	10	23	34	....	6
38	21	18	4	1	....	26	7	83	290	120	22	7	1	167	362	84	354	147	385	2	.....
5	....	....	....	....	....	1	2	6	44	63	5	1	....	10	105	2	.....	.....	2	....	.....
167	80	83	3	....	....	34	5	127	325	136	56	7	....	705	516	205	48	21	65	....	.....
13	2	1	....	....	....	4	1	11	90	92	1	....	....	62	152	2	.....	9	24	....	.....
1	....	....	....	....	....	....	....	.....	30	4	....	....	....	.....	1	.....	.....	.....	35	....	.....
.....	....	....	1	....	....	....	1	.....	32	24	....	....	....	8	39	.....	3	7	4	....	.....
.....	1	....	....	....	....	....	....	1	1	1	....	....	....	1	4	.....	.....	.....	.....	....	.....
1	1	....	1	....	....	2	1	3	8	2	....	....	....	20	24	.....	.....	10	.....	....	.....
8	4	3	....	....	....	5	6	14	137	115	2	2	....	58	204	11	15	57	16	1	
.....	....	....	....	....	....	1	1	1	2	1	....	....	....	.....	1	.....	9	1	41	....	.....
1	....	....	....	....	....	2	....	4	8	9	4	....	....	9	15	.....	.....	.....	1	....	.....
.....	....	....	....	....	....	....	....	1	.....	3	....	....	....	.....	1	.....	.....	1	2	....	.....
1	....	....	....	....	....	....	....	.....	.....	.....	....	....	....	.....	1	.....	.....	.....	.....	....	.....
3	2	....	....	....	....	4	4	14	87	68	1	....	....	56	125	51	28	77	8	....	2
.....	....	....	....	....	....	....	....	.....	3	1	1	....	....	.....	1	.....	.....	1	1	....	.....
1	....	....	....	....	....	2	1	2	11	6	....	....	....	2	19	.....	1	5	1	....	.....
1	2	1	....	....	....	3	2	10	24	29	1	....	....	13	23	36	31	44	33	....	.....
.....	....	2	1	1	1	19	27	8	146	128	....	....	....	38	191	350	269	664	13	....	.....
1	2	....	....	....	....	13	2	3	23	15	5	10	....	39	16	6	9	19	6	....	.....
.....	....	....	....	....	....	....	....	.....	.....	3	....	....	....	.....	.....	4	.....	.....	.....	....	.....
4	....	2	1	....	....	4	....	18	45	19	1	1	....	15	18	18	22	31	23	....	.....
7	4	3	....	1	....	3	....	9	29	18	3	2	....	13	32	13	8	9	13	....	.....
.....	....	....	....	....	....	....	....	.....	8	4	3	....	....	2	9	.....	.....	6	1	....	.....
1	1	....	....	....	....	3	4	5	77	69	6	....	....	31	120	32	13	18	8	....	.....
1	2	....	1	....	....	....	....	2	4	6	....	....	....	7	10	.....	.....	.....	2	....	.....
.....	....	....	....	....	....	....	....	.....	1	.....	....	....	....	1	.....	.....	.....	.....	.....	....	.....
3	....	....	....	....	....	1	....	7	18	10	....	1	....	37	17	8	3	6	9	....	.....
1	1	1	....	....	....	....	....	1	15	3	7	....	1	8	11	.....	2	.....	.....	....	.....
710	424	215	38	8	2	652	116	1,214	3,917	2,533	836	350	68	3,253	5,549	1,235	1,214	1,567	2,120	4	9

TABLE

Immigration, via Ocean Ports, Showing Racial Origin

Racial Origin	Totals	British	U.S.A. Citizens	Danzig	Mexican	Central American	West Indian (not Br.)	Belgian	Bulgarian	Czecho-Slovakian	Finnish	French	German	Greek
Albanian	4	2												
Armenian	2	1												
Belgian	100	8	3					88						
Bohemian	332									325			1	
British—														
English	2,489	2,467	13					1		2		1	1	
Irish	375	374	1											
Scotch	643	642	1											
Welsh	59	59												
Bulgarian	15	4							11					
Croatian	106	2								2				
Czech	290	2								246			1	
Dutch	264	46			1					1				
East Indian	11	11												
Esthonian	3	1												
Finnish	57	3									54			
French	152	49	9					17		1		69		
German	1,021	35		9		4	3			640			139	
Greek	115	3												101
Hebrew	1,321	120		2		5		1		299		8	399	
Italian	186	26								1				
Japanese	36	15												
Jugo-Slavian	55	1								14				
Lettish	3	1												
Lithuanian	49	4												
Magyar	329	3								10			4	
Moravian	52	2								50				
Negro	7	7												
Persian	1													
Polish	297	10					1			1				
Portuguese	1	1												
Roumanian	20	2												
Russian	134	14						1					1	
Ruthenian	1,509	5								9				
Scandinavian—														
Danish	71	12												
Norwegian	40	12												
Swedish	13	3												
Serbian	17													
Slovakian	206	3								185			2	
Spanish	9	1	1											
Swiss	49	1								1				
Syrian	14	10												
Totals	10,457	3,962	28	11	1	9	4	108	11	1,787	54	78	548	101

23

by Nationality, for the Fiscal Year 1939-40

Dutch	Hungarian	Italian	Jugo-Slavian	Polish	Roumanian	Russian	Danish	Norwegian	Swedish	Swiss	Ukrainian	Albanian	Esthonian	Latvian	Lithuanian	Spanish	Japanese	Persian	Syrian	Turkish
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	102	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	.....	.....	38	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
216	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	1	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
8	6	.....	30	101	26	.....	.....	.....	.....	15	.....	.....	.....	.....	2	3	.....	.....	.....	.....
.....	.....	1	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	48	4	7	286	64	1	.....	.....	.....	3	.....	.....	.....	5	49	.....	.....	.....	.....	.....
.....	.....	159	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	.....	.....	.....
.....	2	.....	38	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45	.....	.....	.....	.....	.....
.....	291	.....	2	.....	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
.....	.....	.....	.....	284	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	115	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	5	.....	.....	1,470	17	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	59	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	6	.....	5	1	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	.....
249	360	164	211	2,301	147	6	59	29	10	73	2	2	2	7	96	10	21	1	4	1

TABLE 24

Immigration, from the United States, Showing Racial Origin by Nationality, for the Fiscal Year 1939-40

Racial Origin	Totals	British	U.S.A. Citizens	Belgian	Czecho-Slovakian	French	German	Greek	Dutch	Hungarian	Italian	Jugo-Slavian	Polish	Roumanian	Russian	Danish	Swedish	Swiss	Spanish	Armenian	Syrian
Armenian	1																			1	
Belgian	23	5	14	4																	
Bohemian	9	1	8																		
British—																					
English	1,878	506	1,371			1															
Irish	710	141	569																		
Scotch	702	209	493																		
Welsh	75	19	56																		
Croatian	2	1	1																		
Czech	3		1		1					1											
Dutch	147	16	130						1												
Esthonian	1		1																		
Finnish	20	2	18																		
French	794	86	699	1		7												1			
German	510	88	402				18								1			1			
Greek	10		6					4													
Hebrew	302	55	213		3	1	16			3			4	1	2			4			
Italian	64	13	41								10										
Jugo-Slavian	6	1	2									3									
Lettish	2		2																		
Lithuanian	5	2	3																		
Magyar	37	4	19							9				5							
Negro	22	5	17																		
North American Indian	4		4																		
Polish	51	12	36				1						2								
Portuguese	3	1	2																		
Roumanian	8	4	4																		
Russian	47	3	39				1				1				3						
Ruthenian	16	4	10										1	1							
Scandinavian—																					
Danish	39	7	31													1					
Icelandic	4	3	1																		
Norwegian	89	15	74																		
Swedish	80	12	64							1							3				
Serbian	4	1	3																		
Slovakian	22	7	9		4		1						1								
Spanish	10	1	4			2													3		
Spanish-American	1	1																			
Swiss	32	5	26															1			
Syrian	15	4	10																		1
Totals	5,748	1,234	4,383	5	8	11	37	4	1	14	11	3	8	7	6	1	3	7	3	1	1

TABLE 25

Immigration via Ocean Ports, Showing Conjugal Condition by Age Groups and Sex, for the Fiscal Year 1939-40

Age Groups	Males					Females				
	Married	Single	Widowed	Divorced	Totals	Married	Single	Widowed	Divorced	Totals
Years 0-14	.....	1,412	.....	.....	1,412	.....	1,257	.....	.....	1,257
" 15-19	1	596	.....	.....	597	34	541	.....	.....	575
" 20-24	43	309	.....	.....	352	189	282	.....	.....	471
" 25-29	206	278	.....	1	485	388	240	3	8	639
" 30-39	682	223	4	3	912	1,025	218	17	10	1,270
" 40-49	529	58	10	7	604	545	97	48	4	694
50 years and over	385	45	61	10	501	260	103	315	10	688
Totals	1,846	2,921	75	21	4,863	2,441	2,738	383	32	5,594

TABLE 26

Immigration from the United States, Showing Conjugal Condition by Age Groups and Sex, for the Fiscal Year 1939-40

Age Groups	Males					Females				
	Married	Single	Widowed	Divorced	Totals	Married	Single	Widowed	Divorced	Totals
Years 0-14	.....	694	.....	.....	694	.....	618	.....	.....	618
" 15-19	2	163	.....	.....	165	61	170	1	.....	232
" 20-24	29	162	.....	.....	191	279	123	.....	.....	402
" 25-29	108	114	1	1	224	301	73	4	6	384
" 30-39	303	119	2	8	432	494	84	18	16	612
" 40-49	290	64	13	20	387	295	39	52	22	408
50 years and over	311	58	68	9	446	248	68	217	20	553
Totals	1,043	1,374	84	38	2,539	1,678	1,175	292	64	3,209

TABLE 27

Immigration via Ocean Ports, Showing Origin and Person to whom Destined, for the Fiscal Year 1939-40

Racial Origin	Totals	Husband	Parent	Brother	Sister	Fiancée	Friend	Relative	Employer.	Others
Albanian	4	2	.....	.....	.....	.....	1	1	.....	.....
Armenian	2	.....	.....	1	.....	.....	.....	1	.....	.....
Belgian	100	5	7	9	1	1	4	39	2	32
Bohemian	332	.....	.....	1	.....	.....	5	6	1	319
British—										
English	2,489	95	190	113	111	46	346	741	185	662
Irish	375	14	39	40	33	10	59	89	19	72
Scotch	643	27	63	39	57	20	73	221	31	112
Welsh	59	4	3	.....	2	5	12	20	2	11
Bulgarian	15	5	3	.....	.....	4	.....	1	.....	2
Croatian	106	37	53	1	.....	10	.....	1	1	3
Czech	290	11	17	8	.....	3	34	39	8	170
Dutch	264	3	22	7	1	1	16	24	2	188
East Indian	11	1	6	1	.....	.....	.....	2	.....	1
Esthonian	3	1	.....	.....	.....	.....	.....	.....	.....	2
Finnish	57	4	10	1	1	2	1	5	5	28
French	152	8	18	1	3	4	11	25	16	66
German	1,021	21	29	15	2	4	42	106	12	790
Greek	115	37	65	.....	.....	5	.....	4	.....	4
Hebrew	1,321	32	70	70	17	11	172	262	16	671
Italian	186	60	94	2	1	2	3	11	6	7
Japanese	36	28	3	.....	.....	.....	1	2	.....	2
Jugo-Slavian	55	18	26	.....	.....	8	.....	1	.....	2
Lettish	3	.....	.....	.....	.....	.....	1	.....	1	1
Lithuanian	49	4	3	.....	.....	1	.....	5	1	35
Magyar	329	80	138	8	1	22	14	23	3	40
Moravian	52	.....	.....	1	.....	1	.....	2	.....	48
Negro	7	.....	1	.....	.....	1	.....	1	.....	4
Persian	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Polish	297	37	89	7	2	17	47	58	2	38
Portuguese	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Roumanian	20	3	9	1	1	3	1	1	.....	1
Russian	134	10	18	11	1	1	7	45	.....	41
Ruthenian	1,509	89	179	83	13	19	319	576	2	229
Scandinavian—										
Danish	71	2	7	5	1	3	4	10	.....	39
Norwegian	40	8	6	.....	.....	2	1	7	2	14
Swedish	13	.....	1	.....	.....	1	2	2	2	5
Serbian	17	3	5	.....	.....	3	.....	4	.....	2
Slovakian	206	54	83	1	.....	4	7	14	.....	42
Spanish	9	1	4	.....	.....	.....	.....	1	.....	3
Swiss	49	.....	1	1	.....	2	6	3	2	34
Syrian	14	4	.....	3	.....	1	1	3	.....	2
Totals	10,457	709	1,262	430	248	217	1,190	2,357	321	3,723

TABLE 28

Immigration from the United States, Showing Origin and Person to whom Destined, for the Fiscal Year 1939-40

Racial Origin	Totals	Husband	Parent	Brother	Sister	Fiancée	Friend	Relative	Employer	Others
Armenian	1									1
Belgian	23	5	1			1	1	2	6	7
Bohemian	9	3	1				1	3		1
British—										
English	1,878	284	394	48	60	44	78	319	114	537
Irish	710	114	138	13	21	11	29	130	51	203
Scotch	702	102	144	14	24	13	33	132	45	195
Welsh	75	10	10	3	1	4	6	6	9	26
Croatian	2	2								
Czech	3					1	1	1		
Dutch	147	22	15	4	5	5	6	24	11	55
Esthonian	1		1							
Finnish	20	7	5					3	1	4
French	794	104	182	17	13	10	15	125	57	271
German	510	104	64	20	8	17	15	82	37	163
Greek	10	1	1	1		1	1	1		4
Hebrew	302	83	52	9	1	5	15	58	14	65
Italian	64	14	7	2		1	2	18	2	18
Jugo-Slavian	6	2		1		2				1
Lettish	2	1	1							
Lithuanian	5	2	1							2
Magyar	37	7	5			1	9	5	2	8
Negro	22	5	3			1		2	4	7
North American Indian	4		2							2
Polish	51	16	6	2	1		1	3	4	18
Portuguese	3	1	1							1
Roumanian	8	4	1						1	2
Russian	47	3	12	1			4	8		19
Ruthenian	16	8	2			1		1		4
Scandinavian—										
Danish	39	3	6	1	1	1		10	4	13
Icelandic	4		3					1		
Norwegian	89	18	9	2	1	2	5	12	9	31
Swedish	80	15	19	1		1	4	5	8	27
Serbian	4	2				1				1
Slovakian	22	9	3			2	2	2	1	3
Spanish	10	1							3	6
Spanish-American	1	1								
Swiss	32	6	4	1		1	1	4	5	10
Syrian	15	9	1	1						4
Totals	5,748	968	1,094	141	136	126	229	957	388	1,709

TABLE 29

Admissions and Rejections, by Divisions, for the Fiscal Year 1939-40

—	Ocean Ports		International Boundary Ports		Ocean Ports and International Boundary Ports	
	Admissions	Rejections	Admissions	Rejections	Admissions	Rejections
Atlantic Division—						
Quebec	5,827	26	.....	.....	.....	.....
Halifax	1,709	29	.....	.....	.....	.....
Saint John	705	5	.....	.....	.....	.....
North Sydney	401	31	.....	.....	.....	.....
Montreal	137	27	.....	.....	.....	.....
Louisburg	33	.....	.....	.....	.....	.....
Sydney	12	11	.....	.....	.....	.....
New York	1,169	29	.....	.....	.....	.....
Boston	11	.....	.....	.....	.....	.....
International Boundary Ports	.....	.....	1,858	2,413	.....	.....
Totals	10,004	158	1,858	2,413	11,862	2,571
Eastern Division— International Boundary Ports	.....	.....	2,503	6,187	2,503	6,187
Western Division— International Boundary Ports	.....	.....	780	672	780	672
Pacific Division—						
Vancouver	253	6	.....	.....	.....	.....
Victoria	53	.....	.....	.....	.....	.....
New Westminster	13	.....	.....	.....	.....	.....
International Boundary Ports	.....	.....	607	724	.....	.....
Totals	319	6	607	724	926	730
Other Ocean Ports	134	14	.....	.....	134	14
Grand Totals	10,457	178	5,748	9,996	16,205	10,174

TABLE 30

Rejections, at Ocean Ports, by Causes and Nationalities, from 1902-3 to 1939-40

—	Fiscal Years																			
	1902-3 to 1912-3	1913-4 to 1922-3	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29	1929-30	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	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	5,971
Civil causes.....	5,094	5,604	862	948	226	594	215	266	243	444	298	213	177	206	183	236	202	170	167	16,348
Totals.....	9,256	6,633	992	1,031	266	689	319	360	321	483	324	229	194	215	196	247	210	177	177	22,319
By Nationalities																				
British.....	1,240	978	187	199	109	209	150	154	160	251	180	126	123	150	123	138	86	94	124	4,781
American.....	175	134	6	11	.....	5	2	3	8	6	4	13	11	13	7	7	4	9	5	423
Other countries....	7,841	5,521	799	821	157	475	167	203	153	226	140	90	60	52	66	102	120	74	48	17,115
Totals.....	9,256	6,633	992	1,031	266	689	319	360	321	483	324	229	194	215	196	247	210	177	177	22,319

TABLE 31

Deportations, After Having Been Admitted, by Causes, Nationalities, and Provinces, from 1902-3 to 1939-40

—	Fiscal Years																		
	1902-3 to 1912-3	1913-4 to 1922-3	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29	1929-30	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	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	10,869
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	27,995
Criminality	1,083	3,989	511	520	453	447	426	441	591	868	1,006	836	493	267	207	117	101	114	110	12,580
Other civil causes	530	793	93	58	189	149	257	194	107	200	270	277	250	172	163	240	203	229	237	4,611
Accompanying deported persons	145	262	78	145	158	165	254	235	559	274	545	626	439	81	34	57	21	10	5	4,093
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	60,148
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	34,222
American	1,066	4,566	417	321	330	351	297	294	228	279	260	331	319	199	146	167	138	145	147	10,001
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	15,925
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	60,148
By Provinces																				
Maritime Provinces	147	409	38	32	43	48	48	70	93	148	252	244	260	62	42	61	27	40	61	2,125
Quebec	1,589	2,197	301	206	233	233	240	255	480	509	984	1,343	596	163	106	129	102	112	103	9,881
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	21,973
Manitoba		1,310	802	242	195	177	279	403	1,296	625	1,014	858	408	71	43	32	21	22	8	
Saskatchewan	1,783	691	110	115	113	118	197	173	277	414	767	490	261	91	36	26	14	28	9	18,764
Alberta		1,041	102	134	178	169	260	187	396	511	631	738	467	184	79	77	40	19	32	
British Columbia	491	1,876	206	282	334	259	216	276	306	381	549	832	655	210	137	119	86	92	90	7,397
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	60,148

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

SIR,—I have the honour to submit a brief report of Soldier Settlement activities for the fiscal year ended March 31, 1940.

Included in this report is a statement relating to field services performed for other Departments of the Dominion Government.

Your obedient servant,

G. MURCHISON,
Director of Soldier Settlement.

OTTAWA, November 12, 1940.

SOLDIER SETTLEMENT OF CANADA

There were 18,765 farms under administration on March 31, 1940; the net investment in these properties was $35,710,872.06. There were 8,832 soldier settlers, 6,112 civilian purchasers, and 1,610 British Family settlers on these farms, and 2,211 farms were on hand for resale. Of the latter 1,938 were leased during the year.

The main activities to report are: substantial progress in debt adjustment under the Farmers' Creditors Arrangement Act; marked improvement in collections compared with the previous fiscal year; further reduction in loan administration cost; field work arising out of the war, i.e., rural investigations for the Dependents' Allowance Board.

In the twelve months' period, 1,648 soldier settlers and other purchasers applied for debt reduction or extension of payment terms bringing the total number of applications to 7,314. Boards of Review dealt with 2,791 cases, bringing the total number of completed cases to 5,745. Debt reduction has been awarded in 4,736 cases with aggregate reductions of $9,644,428.03, or an average reduction of $2,036. To date, 3,954 soldier settlers have applied; 3,033 cases have been dealt with finally by Boards of Review, and 2,405 soldier settlers have been awarded debt reduction aggregating $4,704,336.16, an average of $1,956. This work involves inspection of each applicant's farm and examination of the debt position in relation to capacity to pay. It is estimated a further period of one year will be required to complete debt adjustment under the Farmers' Creditors Arrangement Act.

Collections on account of loan repayments total $1,794,677.04, an increase of $422,050.78 compared with the previous fiscal year. The number of settlers and other purchasers who made payments was 11,892 against 9,597 the previous year, an increase of 2,295. The general betterment was brought about by two factors: (*a*) improved crop conditions in the Province of Saskatchewan, and (*b*) a greater incentive on the part of many settlers to pay after having their debts reduced in line with the value of their farms.

Loan administration salary costs were further reduced by $66,479.51. This reduction was brought about by the dropping of 12 positions on retirement of members of the staff, the seconding of 5 members of staff to other departments, 4 enlistments in the Canadian Active Service Force, and a consequent rearrangement and curtailment of duties which enabled the carrying on of the work. An additional 19 members of the staff were transferred with their duties to the Comptroller of the Treasury.

In November, 1939, by arrangement between the Minister of Mines and Resources and the Minister of National Defence, Soldier Settlement undertook the investigation of applications in rural Canada (with the exception of Quebec) for the Dependents' Allowance Board. A total of 1,692 investigations for dependents' allowance has been made to March 31, 1940, with indications of an increase in this work during the next fiscal year.

Soldier Settlement field staff has made 11,254 investigations for other departments of Government, and 3,419 appraisals of land during the year, as follows:—

Investigations—	
Departent of Pensions and National Health	2,130
War Veterans' Allowance Board	6,423
Canadian Pension Commission	146
Department of Mines and Resources—	
Immigration Branch	30
Lands, Parks and Forests Branch—Lands	80
Lands, Parks and Forests Branch—Adjustment of seed grain liens.	310
Indian Affairs—Collections	429
Dependents' Allowance Board	1,692
Enemy Alien Estates	14
Total	11,254
Land Appraisals—	
Department of Finance (F.C.A. Act)	3,024
Canadian Farm Loan Board	26
Central Mortgage Bank	369
Total	3,419