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, 1942

OTTAWA
EDMOND CLOUTIER
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
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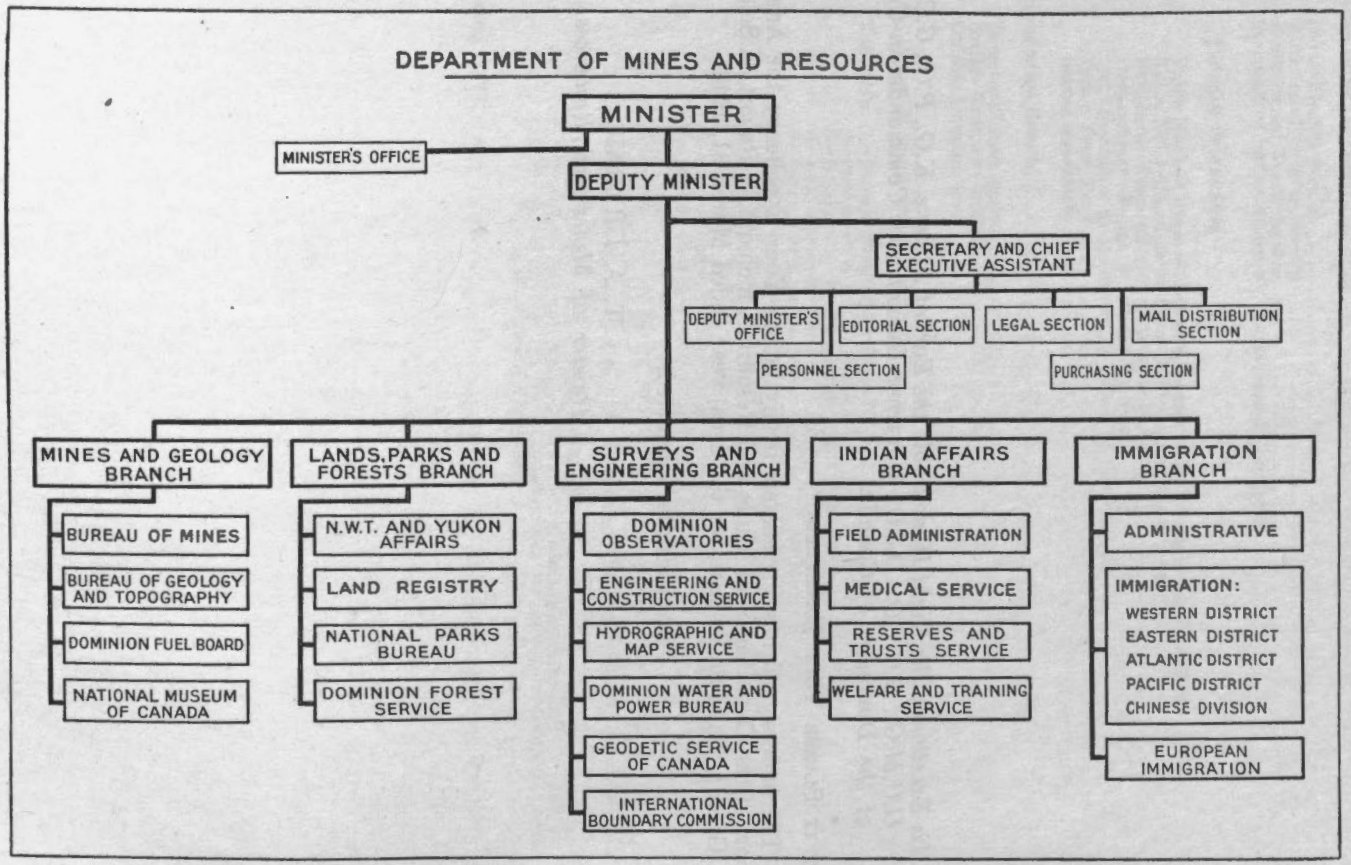
To His Excellency the Right Honourable the Earl of Athlone, K.G., P.C., G.C.B., G.C.M.G., G.C.V.O., D.S.O., Governor General and Commander-in-Chief of the Dominion of Canada.

MAY IT PLEASE YOUR EXCELLENCY:

The undersigned has the honour to lay before Your Excellency the Annual Report of the Department of Mines and Resources, including a Report on Soldier and General Land Settlement, for the fiscal year ended March 31, 1942.

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, 1942

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

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

Since the Department was organized in 1936 there have been progressive increases in revenue. In spite of the war the increase was substantial during the year 1941-42 and the total is now nearly double that for 1936-37. Expenditures during the same period increased from $16,322,501.47 to a peak of $23,338,207.81 in 1939-40, and then dropped to the low indicated in the financial summary that follows.

Some of our Services are now operated on little more than maintenance bases; others, exemplified by the Immigration and Indian Affairs Branches, have to provide service of a character that does not lend itself to reduction even during critical times. The Immigration Branch must maintain inspectional staffs along the International Boundary and at seaports no matter how small may be the number of persons seeking entry as immigrants or visitors. In this connection there is close collaboration between the Customs and Immigration Services to keep border staffs down to a minimum. The Branch has also had to assume many added duties in Canada and Overseas arising out of the war, as indicated in the Director's report. Responsibility for the welfare of the Indians continues whether there is a war or not and the cost of Indian Affairs administration is lessened only to the extent that employment is more readily available and accepted.

Other Services have had to expand to take care of war demands. Allotments out of war appropriations are shown, but do not begin to indicate the extent of the war activities of the Department. They simply show the cost of the war work that could not be taken care of under regular appropriations. Generally speaking it may be said that the following are concentrating almost entirely on war work—Bureau of Geology and Topography, Bureau of Mines, Explosives Division, Forest Products Laboratories, Geodetic Service, and the Hydrographic and Map Service. The Engineering and Construction Service has had to assume added responsibilities connected with Alternative Service and Japanese work camps. The nature of the war activities of these and other divisions of the Department is indicated in the reports of the Directors.

During the year the duties and functions of the Dominion Fuel Board were transferred to the Wartime Prices and Trade Board, Department of Finance. Therefore, the activities of the Board are not reported herein, nor is the amount of coal subventions paid during 1941-42 shown in the financial summary.

The entry of the United States into the war, coming as it did late in the calendar year, did not seriously affect the number of persons visiting our National Parks; in fact there was some increase over the previous year. However, indications are that there will be a falling off owing to travel restrictions and gasoline rationing.

It has been thought advisable to make some reductions in the size of the Annual Report, and over forty pages of tabulation have been dropped. However, it is believed the most important have been retained and that they will prove adequate for the time being at least.

SUMMARY OF REVENUE AND EXPENDITURE FOR FISCAL YEAR 1941-42

	Revenue	Expenditure Ordinary	Expenditure Special including War	Total Expenditure
General Administrative Branch	$ 112 50	$ 167,119 76	$	$ 167,119 76
Mines and Geology Branch— [1]				
Branch Administration		27,949 51		
Bureau of Mines	6,884 63	429,121 07		
Bureau of Geology and Topography [2]	2,335 96	653,243 94		
National Museum of Canada		46,173 10		
War—Miscellaneous			70,020 15	
	$ 9,220 59	$ 1,156,487 62	$ 70,020 15	
				$ 1,226,507 77
Lands, Parks and Forests Branch—				
Branch Administration		19,843 62		
Dominion Lands, Ordnance Lands, etc.	63,279 49	109,903 45		
National Parks and Historic Sites	471,514 96	1,198,403 92	324,667 19	
Forestry	20,759 25	290,203 27	14,860 47	
Northwest Territories [3]	166,957 31	314,436 40		
Yukon Territory	86,928 06	90,223 83		
War—Miscellaneous			305,928 16	
	$ 809,439 07	$ 2,023,014 49	$ 645,455 82	
				$ 2,668,470 31
Surveys and Engineering Branch—				
Branch Administration		21,094 11	285 50	
Dominion Observatories	517 46	123,170 74		
Dominion Water and Power Bureau	125,815 44	223,645 12		
Geodetic Service	194 22	130,149 21		
International Boundary Commission	10 85	30,918 91		
Engineering and Construction Service	973 45	80,032 96	18,138 28	
Hydrographic Service	15,638 22	346,721 70		
Legal Surveys and Map Service	34,087 61	171,911 07		
War—Miscellaneous			177,866 55	
	$ 177,237 25	$ 1,127,643 82	$ 196,290 33	
				$ 1,323,934 15

SUMMARY OF REVENUE AND EXPENDITURE FOR FISCAL YEAR 1941-42—*Conc.*

	Revenue	Expenditure Ordinary	Expenditure Special including War	Total Expenditure
Indian Affairs Branch—				
Branch Administration	$	$ 52,839 00	$	$
Indian Agencies—Administration	1,724 14	650,086 79		
Reserves and Trusts—Administration		32,697 49	71,055 42	
Indian Education	463 19	1,878,726 07		
Medical Services	2,292 57	1,383,985 75	6,962 95	
Welfare of Indians	3,861 12	743,013 77		
Miscellaneous Statutory Items (Annuities and Pensions)		262,817 00		
Miscellaneous Revenue—not including revenue accruing to Indian Band funds	8,226 43			
	$ 16,567 45	$ 5,004,165 87	$ 78,018 37	
				$ 5,082,184 24
Immigration Branch—				
Administration of the Immigration Act and the Chinese Immigration Act		156,787 09		
Field and Inspectional Service—Canada		1,044,329 07		
Field and Inspectional Service—Abroad		84,476 09		
Relief of Distressed Canadians outside Canada		3,668 97		
Miscellaneous Statutory Items			205,250 66	
War—Miscellaneous		1,046 94		
Miscellaneous Revenue	69,003 32			
	$ 69,003 32	$ 1,290,308 16	$ 205,250 66	
				$ 1,495,558 82
Total for Department	$ 1,081,580 18	$10,768,739 72	$ 1,195,035 33	$11,963,775 05

NOTES—

[1] By Order in Council P.C. 7082, September 10, 1941, the power, duties, and functions of the Dominion Fuel Board were transferred to the Department of Finance.

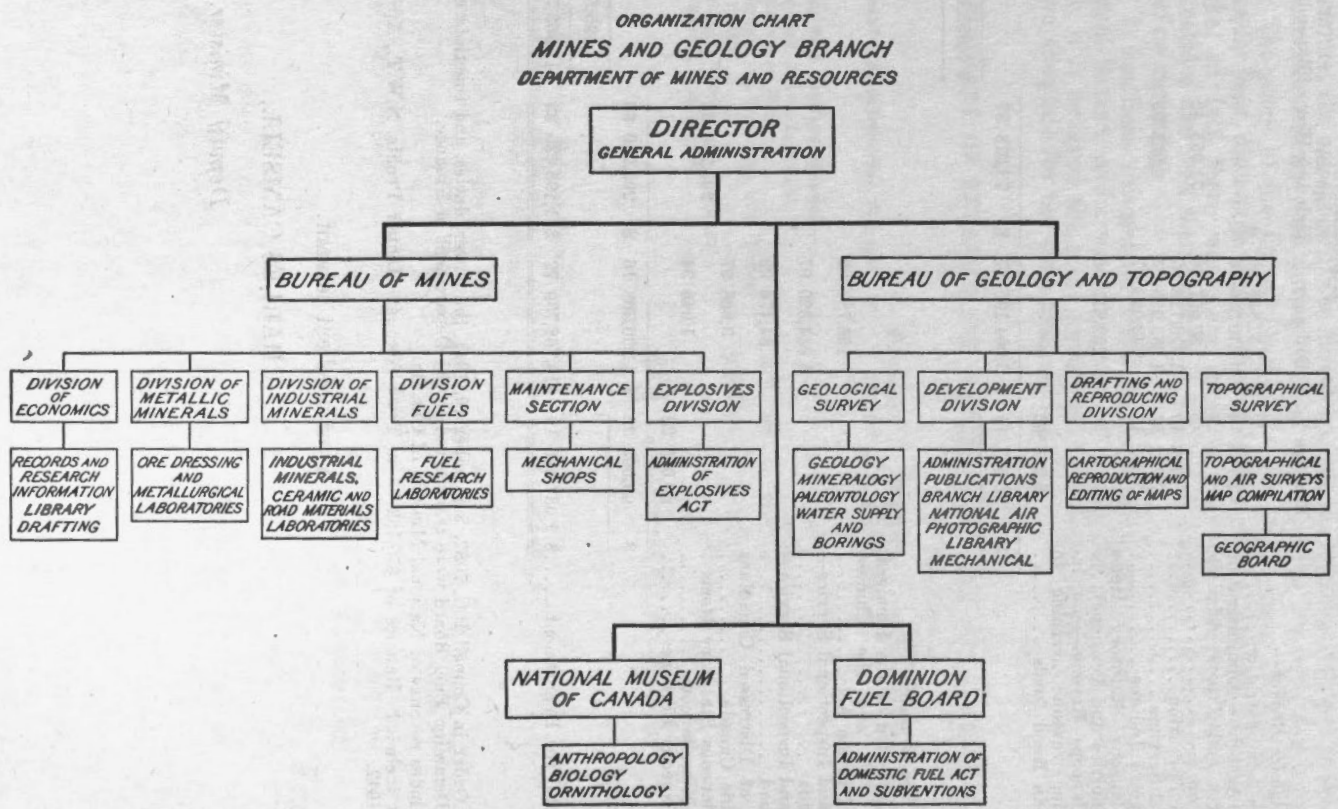
[2] Includes revenue of National Museum of Canada.

[3] Not included—Balance of $75,182.23 in Trust Account—Liquor Profits, N.W.T., April 30, 1942.

Your obedient servant,

CHARLES CAMSELL,

Deputy Minister.



Organization Chart, Mines and Geology Branch.

MINES AND GEOLOGY BRANCH

W. B. TIMM, DIRECTOR

Work of direct war interest continued to receive the chief attention of the Branch, the increase in such activities over the previous year being largely a reflection of Canada's steadily expanding war effort. The information given on this work in the reviews by Bureaus and Divisions is mostly general in character, but it is apparent from these reviews that the activities of the Branch are an integral part of the Canadian war effort. Minerals are by far the most important of the raw materials used in making and operating the tools of war, and all matters affecting their discovery, development, processing, production, marketing, and use are of concern to the Branch. In wartime this applies in particular to those metals and minerals of which the Canadian production is short of requirements.

An important part of the work of the Branch is the assistance given through the Physical Metallurgical Laboratories to the Inspection Board of the United Kingdom and Canada, the Defence Services, the Department of Munitions and Supply, and to war industries, in the investigation of industrial processes to meet the special metal requirements of tanks, guns, planes, shells, and other implements of war; in the check testing of materials; in providing information on specifications for alternative or substitute alloys; and in improving and developing methods of heat-treating metals and alloys of various composition. Such assistance proved of real aid in avoiding delays and in improving the quality of the material produced.

Early in the year the Branch undertook the commercial production of a major component of secret equipment for the Naval Service. This involved the design, purchase, and installation of equipment and machinery. A special allotment from the War Appropriation vote was granted, chiefly to meet the need for additional staff and equipment in this work and in the work of the Physical Metallurgical Laboratories, and to provide the extra staff required in the enlarged activities concerned with the administration of the Explosives Act. The total extra staff employed was seventy-five.

Special attention was given also to the problem of meeting the extraordinary mineral requirements of the war effort, particularly in reference to the ores of tungsten, chromium, and manganese, and to mica, graphite, and fluorspar. The greater part of the field work of the Geological Survey was devoted to the examination of occurrences of these strategic minerals and to the mapping of oil structures, and much of the investigative work in the Bureau of Mines was on these minerals. This latter included the concentration of sorted scheelite, a tungsten ore, as a means of encouraging production. A handbook, " Prospectors Guide for Strategic Minerals ", was issued as an aid to prospectors.

A feature of the work on fuels was the investigation of coal tar and petroleum oil products for the greater production of toluene for use in the manufacture of explosives. The facilities of the Fuel Research Laboratories continued to be utilized by the Departments of Munitions and Supply and National Defence in reviewing and advising on coal tenders and in checking the quantity of the coal delivered.

By Order in Council P.C. 7082, September 10, 1941, the powers, duties, and functions of the Dominion Fuel Board were transferred to the Department of Finance. Accordingly, the activities of the Board are not included in this report.

Mr. John McLeish, who became Director of the Branch on the reorganization of the Department in December 1936, retired on superannuation on November 1, 1941, after 45 years of distinguished service. Prior to his appointment, he had served for 15 years as Director of the Mines Brauch of the former Department of Mines, previous to which he had served for 14 years as Chief of the Division of Mineral Resources and Statistics.

To meet the increasing war needs for its products, Canada's mining industry produced metals and minerals to a record total value of more than $560,000,000 in 1941, the amount being far in excess of the value of output in 1939, when a peacetime peak was reached. These products are being used not only to supply Canadian needs, but a large share of the needs of the Allied countries, more especially Great Britain and the United States. By arrangements made at the commencement of the war, Great Britain obtains most of the Canadian surplus of copper and zinc, and Canada is also supplying that country with large quantities of aluminium, nickel, lead, and mercury, and of other metals and minerals. The United States is almost entirely dependent upon Canada for its supplies of nickel and asbestos.

Although the setting of record after record in the production of minerals is necessary to meet the increasing demands of war, it places a severe strain on the industry and should properly be regarded as part of the cost of war; for the rate of depletion of reserves is far in excess of the rate of replenishment by the discovery of new sources of supply. This applies to most of the important metals and minerals, and especially to the non-ferrous base metals, and is a matter of serious concern in view of the increasing importance of the mineral industry in the economy of the country.

MINING ROADS DIVISION

No special funds were voted by Parliament to continue the assistance in the construction of transportation facilities to serve mining areas and the expenditures that were made during the fiscal year came from the War Appropriation. An amount of $666.67 was paid to the Government of British Columbia as the Dominion Government's share of the cost of completing an all-weather road, started in the previous year, to the mercury mine at Pinchi Lake. One-third of the cost was contributed by the company concerned.

In Ontario, three projects were undertaken on a similar basis for roads into the St. Anthony, Renabie, and Jerome mines, but as the roads were not completed at the close of the year no payments were made on the accounts.

BUREAU OF GEOLOGY AND TOPOGRAPHY

The Geological Survey had thirty parties in the field in 1941, six of which were in British Columbia, four in Alberta, one in Saskatchewan, one in Manitoba, three in Ontario, seven in Quebec, one in New Brunswick, three in Nova Scotia, one in Yukon, and three in the Northwest Territories. They were engaged chiefly in areas favourable to occurrences of oil, gold, and strategic war minerals. Nine memoirs, fourteen preliminary geological papers, and fifty geological maps were published.

The Topographical Survey had eleven regular parties and one supervisory party in the field, two of which were in British Columbia, two in Alberta, four in Quebec, two in Nova Scotia, and one in Yukon. Sixteen topographical maps were published.

The Draughting and Reproducing Division reports the publication of 66 maps.

A total of 75,820 reports, maps, and other publications were distributed.

GEOLOGICAL SURVEY

The Geological Survey promotes the discovery and development of Canada's mineral resources by means of geological studies. The nature and extent of the underground water resources in various parts of Canada are ascertained and other investigations are made to obtain information to serve as a basis for the classification of soils for agriculture and forestry. Many requests for advice regarding mineral deposits and allied subjects are also dealt with, and numerous rock and mineral specimens are identified. In addition to the field work in specified areas, eight parties were engaged in examining and evaluating deposits of scheelite, chromite, manganese oxides, and other minerals. Special investigations, each occupying a week or less, were made on deposits of manganese, tungsten, iron, barite, fluorite, gypsum, quartzite pebbles, and building material. Special investigations were also made on the selection of sites for various purposes in collaboration with the Department of National Defence.

Field Work

NORTHWEST TERRITORIES

J. F. Henderson completed the geological mapping of MacKay Lake map-area (latitude 63° to 64°, longitude 110° to 112°), just north of the east arm of Great Slave Lake and 100 miles east of Yellowknife. Several bodies of sedimentary rock and two large bands of greenstone disclosed by the mapping are considered to be favourable for the occurrence of metallic mineral deposits.

A. W. Jolliffe and R. E. Folinsbee studied scheelite-bearing quartz veins in the vicinity of Gilmour Lake, about 40 miles east of Yellowknife. About two hundred scheelite-bearing veins were carefully evaluated by using an ultra-violet lamp, and other help was given to prospectors in the area. A. W. Jolliffe later examined the Quyta Lake map-area (latitude 62° 45′ to 63°, longitude 114° to 114° 30′), north of Yellowknife. The area is crossed by the northward extension of formations that at Yellowknife contain metallic mineral deposits.

YUKON

H. S. Bostock completed the geological mapping of Mayo map-area (latitude 63° to 64°, longitude 134° to 136°) and commenced the mapping of McQuesten map-area (latitude 63° to 64°, longitude 136° to 138°). The rocks with which the silver-lead bodies in the Mayo area are associated extend westward into the adjoining McQuesten area. The areas also hold deposits of antimony, tungsten, and gold. He also collected information for the annual review of the mineral industry of Yukon. He investigated placers containing ferberite, a tungsten mineral, on Canadian Creek, and scheelite-bearing placers in the vicinity of Dublin Gulch.

BRITISH COLUMBIA

C. S. Lord commenced the geological mapping of McConnell Creek map-area (latitude 56° to 57°, longitude 126° to 127°). The area is as favourable for the occurrence of metallic mineral deposits as are other areas farther south.

J. E. Armstrong examined the Pinchi Lake mercury belt. The ore is associated with a fault that was traced northwestward about 100 miles. Cinnabar has been found at four places in or near the fault northwest of Pinchi Lake.

A. H. Lang continued the geological mapping of the east half, Manson River map-area (latitude 55° to 56°, longitude 124° to 125°), much of which is favourable for the occurrence of metallic mineral deposits; it also holds bodies of peridotite that may contain chromite.

A. F. Buckham examined the Barkerville gold belt in Cariboo district. Two mines in the belt produce gold and new ground was being tested.

W. E. Cockfield continued the geological mapping of the east half, Ashcroft map-area (latitude 50° to 51°, longitude 120° to 121°), in which deposits of the common metals and of mercury occur.

H. M. A. Rice continued the geological mapping of the east half, Hope map-area (latitude 49° to 50°, longitude 120° to 121°), which produces gold, copper, and coal.

ALBERTA

B. R. MacKay completed the geological mapping of Wawa map-area (latitude 52° 30′ to 52° 45′, longitude 116° to 116° 15′). An anticline expected to have a Palæozoic core was outlined at the western border of the area.

H. H. Beach completed the geological mapping of Marble Mountain map-area (latitude 51° 45′ to 52°, longitude 115° to 115° 45′). Three anticlinal structures were outlined and shows of oil have been found in two wells.

C. O. Hage completed the geological mapping of Beaver Mines map-area (latitude 49° 15′ to 49° 30′, longitude 114° to 114° 15′), and commenced the mapping of Dyson Creek map-area (latitude 50° 30′ to 50° 45′, longitude 114° 30′ to 114° 45′). The work in Dyson Creek area led to the discovery of a structure that is to be drilled in search of oil.

J. S. Stewart carried out the geological mapping of Bassano map-area (latitude 50° to 51°, longitude 112° to 113°), some 80 miles east of Calgary. He also revisited the Steveville district where oil had since been obtained.

SASKATCHEWAN

G. M. Furnival completed the geological mapping of Cypress Hills map-area (latitude 40° to 50°, longitude 109° to 110°). One slightly domed structure of possible interest for oil exploration is indicated.

MANITOBA

J. D. Bateman commenced the geological mapping of Tartan Lake map-area (latitude 54° 45′ to 55°, longitude 101° 30′ to 101° 45′), immediately east of Flinflon. It has deposits of copper, zinc, and gold.

ONTARIO

T. L. Tanton investigated iron possibilities in the vicinity of Steeprock Lake. Geological relationships similar to those at the known iron deposits were found elsewhere in the neighbourhood.

J. F. Caley continued the study of the geology relating to gas and oil in southwestern Ontario. No pronounced structures were found in the area covered. The gas fields appear to be related to rock porosity rather than to folded structures.

H. C. Cooke and R. E. Folinsbee commenced an evaluation of the scheelite content in the ores of the gold mines in Ontario and western Quebec early in the winter of 1941. The study was still in progress at the end of the fiscal year.

QUEBEC

G. Shaw explored geologically an area of some 30,000 square miles extending east from James Bay between latitudes 51° and 54°. One large band and several small bands consisting of greenstone and sedimentary rock were outlined.

E. D. Kindle commenced the geological mapping of Brock River map-area (latitude 50° to 51°, longitude 74° to 75°) north of the Chibougamau Lake district; like it, the area has belts of favourable prospecting ground.

M. E. Wilson continued the detailed study and mapping of the geology of Rouyn and Beauchastel townships. He traced the important Cadillac fault zone some distance west of its previous known extent.

G. W. H. Norman studied, and mapped in detail, an area in Dubuisson township. The Cadillac fault zone extends eastward across the area. The work also disclosed another fault zone that, like the Cadillac fault zone, may be associated with gold deposits.

C. H. Stockwell made a detailed study of chromite bodies in the St. Cyr and Black Lake areas. A magnetometer was used in an endeavour to locate chromite bodies under overburden.

J. W. Ambrose commenced the study and mapping of ultrabasic intrusives in the Eastern Townships. Chromite deposits occur in rocks of this type.

F. H. McLearn and J. F. Caley examined part of the Jupiter River drainage basin on Anticosti Island late in the field season in an endeavour to find structure favourable for the occurrence of oil.

NEW BRUNSWICK

F. J. Alcock investigated the manganese deposits (exclusive of bog ores) of southeastern New Brunswick. Several manganese deposits are being developed.

NOVA SCOTIA

W. A. Bell examined an area extending westward from Malagash. This work was an endeavour to determine where salt could be found by drilling.

L. J. Weeks continued the geological mapping of Londonderry map-area (latitude 45° 15′ to 45° 30′, longitude 63° 30′ to 63° 45′), and of Bass River map-area (latitude 45° 15′ to 45° 30′, longitude 63° 45′ to 64°). The areas contain iron, manganese, gypsum, barite, and other mineral deposits.

R. T. D. Wickenden made a study of unconsolidated rocks in collaboration with soil surveys being made by the Department of Agriculture.

Office Work

Many reports were prepared, based on examinations of deposits of tungsten, chromite, iron, mercury, manganese, fluorite, and barite. Four memoirs, five papers (preliminary reports), fifteen preliminary and fifteen final editions of maps were prepared for publication.

Palæontological Section

A particularly large number of fossil collections were submitted by field officers for age determinations and their study formed a large part of the office work. Reports were also made on the following collections:

For Department of Mines, British Columbia: Cretaceous plants from north of Bridge River area, submitted by H. Sargent, mining engineer.
For College de Rimouski: shells submitted by Rev. A. A. De Champlain.
For Universite de Montreal, Institut de Biologie: modern molluscs submitted by Mr. Lionel Philippe.

Mineralogical Section

Several special investigations were made, the most important being:

Continuation of an extensive chemical and mineralogical study of chromites from the Eastern Townships, Quebec.

A chemical and mineralogical study of manganese ores from Ontario and Nova Scotia.

A chemical and mineralogical study of hydromagnesite from British Columbia.

A chemical and mineralogical study of a cobalt mineral from British Columbia.

A chemical study of limestones in connection with the mercury deposits of northern British Columbia.

A chemical study of gypsum and gypsite from British Columbia.

Much spectrographic work was done, especially in testing a large number of carbonaceous rocks for vanadium.

More than 5,900 specimens submitted from different parts of Canada were examined and reported upon; about 3,000 specimens were also submitted by visitors, who were given verbal information.

A total of 798 educational collections of minerals and rocks, consisting of 24,268 specimens, were distributed. Most of the collections are usually sold to educational institutions, but in 1941-42 more than two-thirds of them were issued to individuals who were interested in mining and prospecting, especially for strategic minerals.

The following minerals presented to the Geological Survey were added to the mineralogical collections:

Mr. Meth Gorrie, Flagstone, B.C.—50 pounds of fine, cleavable barite from Phillips Creek, near Roosville, about 8 miles east of Kootenay River near the International Boundary.

The following exchange material was received from Charles A. Claflin, 18 Irving Street, West Medford, Mass., U.S.A.: lepidolite, lilac mine, Hardin (30 miles from Towers), New Mexico; half breed copper and silver, Calumet and Hecla, Mich.; sphalerite, near Kremmling, Colo.; stannite, Goodspring, Nevada; ferberite, Vasco No. 5 mine, Nederland, Colo.; vanoxite, Squaw Park, near Thompson, Utah; hetersite, North Groton, N.H.

Water Supply and Borings Section

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

A total of 63,927 samples were received from 290 wells drilled for oil or gas. This total is made up of 52 samples from 1 well in British Columbia, 44,273 samples from 178 wells in Alberta, 226 samples from 2 wells in Saskatchewan, 19,181 samples from 109 wells in Ontario, and 247 samples from 2 wells in Quebec.

A number of water well drillers also sent samples from various parts of the country. Col. F. M. Steel, of the Indian Affairs Branch, Ottawa, sent samples from wells drilled on Indian reserves in Alberta. Professor F. H. Edmunds of the University of Saskatchewan furnished logs of 104 water wells drilled in Saskatchewan.

Chemical analyses were made of nine samples of water from various wells drilled for oil or water.

Inquiries on water supply problems and on the interpretation and correlation of well samples were answered.

British Columbia Office

A total of 2,394 visitors registered at the office and many inquiries were also handled by mail and telephone. A total of 2,598 reports and 1,507 separate maps were issued in response to requests from the public. Determinations were made of a large number of rock and mineral specimens.

TOPOGRAPHICAL SURVEY

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

Field Work

Officer in charge	Sheet name	Sheet number	Latitude and longitude	Scale of publication
A. C. Tuttle..... / E. J. Parlee	Aiken Lake.....	94 C, W.½	56° 00′– 57° 00′ 125° 00′–126° 00′	1 in. to 4 mi.
J. A. Macdonald..	Pincher Creek..... / Glenwoodville.....	82 H/5	49° 15′– 49° 30′ 113° 30′–114° 00′	1 in. to 1 mi.
H. A. S. West.....	Cardston.....	82 H/3, W.½	49° 00′– 49° 15′	1 in. to 1 mi.
	Mountain View.....	82 H/4, E.½	113° 15′–113° 45′	
J. A. Macdonald.. / H. A. S. West....	Waterton.....	82 H/4, W.½	49° 00′– 49° 15′ 113° 45′–114° 00′	1 in. to 1 mi.
W. B. Dingle.....	Lac Charland..... / Lac Denis.....	31 J/16	46° 45′– 47° 00′ 74° 00′– 74° 30′	1 in. to 1 mi.
	Lac Maison Pierre... / Lac Franchere.....	31 J/15	46° 45′– 47° 00′ 74° 30′– 75° 00′	1 in. to 1 mi.
	Lac Ascension..... / Five Finger Lake....	31 J/10	46° 30′– 46° 45′ 74° 00′– 74° 30′	1 in. to 1 mi.
	Grand Lac des Baies.. / St. Guillaume Nord..	31 J/9	46° 30′– 46° 45′ 74° 30′– 75° 00′	1 in. to 1 mi.
H. N. Spence.....	Townships of Bourlamâque, Louvicourt, and NE.¼ Dubuisson.	Control for five detail sheets in the Province of Quebec.		1 in. to 2,000 ft.
J. Carroll..... / C. M. Duncan...	Eastmain area.....	.....	51° 00′– 54° 00′ 74° 00′– 79° 00′	1 in. to 8 mi.
R. F. Dore.....	Earltown..... / Tatamagouche.....	11 E/11	45° 30′– 45° 45′ 63° 00′– 63° 30′	1 in. to 1 mi.
	Shinimikas..... / Pugwash.....	11 E/13	45° 45′– 46° 00′ 63° 30′– 64° 00′	1 in. to 1 mi.
	Malagash..... / Cape John.....	11 E/14	45° 45′– 46° 00′ 63° 00′– 63° 30′	1 in. to 1 mi.
	Shulie.....	21 H/10, E.½ Nova Scotia portion.	45° 30′– 45° 45′ 64° 30′– 64° 45′	1 in. to 1 mi.
A. M. Floyd.....	Springhill..... / River Hebert.....	21 H/9	45° 30′– 45° 45′ 64° 00′– 64° 30′	1 in. to 1 mi.
	Oxford.....	11 E/12, W.½	45° 30′– 45° 45′ 63° 45′– 64° 00′	1 in. to 1 mi.

J. W. Spence supervised the work on a number of the above sheets in the field.

R. C. McDonald was engaged for 6 weeks in making observations for latitude and longitude in Yukon and in northern British Columbia.

S. Hunt was engaged for 2 months in running a control traverse in Anticosti Island.

H. G. Moule was engaged for a similar period in the same area putting in vertical control to assist the Geological Survey.

E. S. Fry and R. W. Clark were engaged during the whole season in field work for the R.C.A.F.

Field work in Nova Scotia was carried out in co-operation with the Provincial Government, which shared the cost.

Office Work

A total of twenty-eight manuscript maps were plotted from ground or air surveys, and cleared to the Map Compilation Section. Ten of the maps were of areas in Alberta, four of areas in Ontario, twelve of areas in Quebec, and two of areas in Nova Scotia.

Forty-one map projects were actively in hand at the end of the year. Planimetric work was completed on ten projects awaiting contouring in the field.

For the Lands, Parks and Forests Branch, a special compilation on a scale of 1 mile to 1 inch was prepared for investigational purposes. The compilation covered an area of about 700 square miles of the west half, southwest quarter, of the Fitzgerald 4-mile map-area.

A re-compilation and tracing was prepared on a scale of 1 inch to 8 miles of part of map-sheets 75 and 85, Tazin River to Back River, as a base for geological work.

The necessary compilation and plotting was carried out in connection with the work undertaken for the Royal Canadian Air Force.

The Map Compilation Section forwarded a total of 72 topographical and geological base maps to the Draughting and Reproducing Division, the number by provinces and territories being: Yukon, 1; Northwest Territories, 5; British Columbia, 1; Alberta, 13; Manitoba and Saskatchewan, 1; Manitoba, 2; Ontario, 7; Ontario and Quebec, 3; Quebec, 37; Nova Scotia, 2.

Thirteen preliminary geological maps were prepared and forwarded for blueprinting.

At the end of the year, 37 map manuscripts in various stages of progress, were in the Map Compilation Section. Of these, five geological base maps were ready for transmission when the geological manuscripts were received. One preliminary geological map was also in hand.

One hundred and twenty-seven map projections were made and base maps for the field and office use of the Geological Survey were prepared. Various index maps and special drawings were made for a variety of purposes.

Physical Geography

The compilation of the Glacial Map of North America was continued and five of the eleven sheets were nearing completion.

Geographical information was prepared for the Department of National Defence. Several lectures were given to Militia units on map reading and interpretation.

DEVELOPMENT DIVISION

The Development Division carries on the general executive and administrative work of the Bureau; administers the general services required by the Bureau and the National Museum, and maintains the National Air Photographic Library.

National Air Photographic Library

This Library has on file for reference approximately 828,500 prints of aerial negatives, covering an area of about 866,000 square miles. These prints are largely from aerial photography carried out by the Royal Canadian Air Force, but include also a considerable number of photographs received from other sources. Because of wartime conditions, only 2,806 new photographs were added to the Library collection, 944 of which were obtained by Canadian Airways Company, Limited, and cover Bourlamaque and Louvicourt townships, Abitibi District, Quebec; 991 were supplied by the United States Department of Agriculture, and cover areas in Ontario adjacent to the Canada-United States boundary, and the remainder were obtained by personnel of the Bureau who were engaged in exploration work in the James Bay area.

Aerial photographs are especially useful in the study and development of Canada's natural resources. The National Air Photographic Library is organized to give all needed assistance in the use of aerial photographs, either to applicants personally, or by correspondence. Inquiries by mail are promptly dealt with and, if necessary, index maps of areas photographed and other related information are prepared and supplied. Facilities for stereoscopic study of the photographs are provided and expert assistance in their interpretation is given. Copies of the photographs are sold at a nominal charge. During the year 30,018 photographs were purchased by the public.

Many representatives of Federal and Provincial Government Services and of commercial organizations visited the Library and were assisted in the selection and interpretation of aerial photographs of the areas in which they were interested. This assistance included the stereoscopic examination of vertical aerial photographs covering the areas adjacent to the Gouin Dam in northern Quebec, in order to determine the possibility of enlarging the watershed area tributary to this dam; the examination of photographs for the location of a tractor road in Haliburton county, Ontario, for the removal of timber from an outlying area, and the examination of photographs covering proposed training areas, for the Department of National Defence.

Photographic Section

This Section handles the wet plate work for the reproduction of geological and topographical maps, the photographic results of field mapping and the photography of fossils, minerals, and specimens of the Bureau and of the National Museum. The following work was completed:

Contact prints—1¼ x 2½ to 36 x 48	9,997
Bromide enlargements—3 x 4 to 32 x 40	2,683
Exposures developed—1¼ x 1½ to 5 x 7	4,336
Dry plate negatives—3 x 4 to 20 x 24	886
Wet plate negatives—8 x 10 to 24 x 30	131
Lantern slides—3¼ x 4	567
Photographs and maps (dry mounted)	3,362
Total	21,962

Library

Owing to shipping and paper limitations experienced by British societies and publishers and the restrictions due to war activities it was difficult to obtain accessions to the Library. However, the total number of accessions was slightly above the previous year and includes:

Books acquired by purchase	119
Books (complete unbound volumes by purchase)	180
Books (by transfer and gift)	520
Pamphlets and reprints (by gift)	420
Canadian Government documents—individual issues (by exchange and gift)	890
British and Foreign Government documents—individual issues (by exchange and gift)	1,277
Canadian periodicals, individual issues	297
British and foreign periodicals, individual issues	1,356
Scientific societies' bulletins, proceedings, and transactions—individual issues (by exchange and gift)	1,915
Total	6,974

Following are other statistical data:

Maps and charts added to the Library	407
Maps and charts borrowed from Library	501
Photographs classified and filed	1,987
Prints borrowed	4,977
Recorded loans of books, pamphlets, periodicals	8,218
Inter-library loans	517
Books borrowed from other libraries	237
Lantern slides loaned to educational institutions and to members of staff	681
Volumes bound	215
Cards added to catalogue	4,821
New cards received for map catalogue	250

Special attention was given to the analysing of significant monographs and information relating to strategic minerals.

A particular effort was made to obtain valuable material by exchange. The new exchanges include sets of the Chicago Naturalist, Primitive Man (in ten volumes); Researches and Transactions of the New York State Archeological Association; Publications of the Catholic Anthropological Conference; Anthropological Publications of the University of Alaska; and the completion of sets from the Lloyd Library of Natural History and the Cranbrook Institute of Science. The British Museum continued to send its valuable monographs, with the loss of only one shipment. A splendid collection of literature on sponges, made by the late L. M. Lambe, was received. Other important gifts include three volumes on folk-music, four volumes of the collections of the New York Historical Society, two volumes on Anthropology from Northwestern University, and many valuable volumes from the Carnegie Institution of Washington and the Geological Society of America. The set of the Catalogue of the Foraminifera and the Scientific Series of the Smithsonian Institution, both invaluable reference works, were purchased.

Progress was made in completing the cataloguing of all foreign maps in the Library.

Mechanical Section

The blue-printing of maps for preliminary papers, and of plans and drawings for war purposes, were important features of the activities, the total output being 72,137 prints (412,809 square feet). Approximately 60 per cent of the output was for The British Admiralty Technical Mission, the Department of Munitions and Supply, the Royal Canadian Air Force, Naval Service, and other departments engaged in war work.

In the Instrument Section, several special instruments were manufactured for the use of the Topographical Division.

Stores and Supplies Section

Field equipment and supplies to the value of approximately $100,000 are stored, checked, repaired, and distributed in this Section. Equipment and supplies were assembled and assigned to forty-two geological and topographical field parties, and three parties engaged in work for the Department of National Defence and other departments. The Section handles all stationery and other office supplies used by the Bureau and the National Museum.

Geological Information and Distribution

A total of 74,018 publications of the Bureau of Geology and Topography and of the National Museum, exclusive of French editions, were distributed. Of these, 14,918 were sent to addresses on the regular mailing lists, and 59,100 were distributed in compliance with written and personal requests for named publications, or requests for general or specific information. The French publications, which are distributed by the Editorial Division, numbered 1,085.

DRAUGHTING AND REPRODUCING DIVISION

A total of sixty-six maps were published, fifty of which were geological maps, the remainder being topographical maps. Three of the geological maps were of areas in the Northwest Territories; four of areas in British Columbia; two of areas in Alberta; twelve of areas in Saskatchewan; three of areas in Saskatchewan and Manitoba; one of an area in Manitoba; two of areas in Ontario; three of areas in Ontario and Quebec; nine of areas in Quebec; one of an area in Quebec and New Brunswick; and ten of areas in New Brunswick. Four of the topographical maps were of areas in the Northwest Territories; one of an area in Yukon; two of areas in British Columbia; one of an area in Alberta; three of areas in Saskatchewan; one of an area in Manitoba; two of areas in Ontario; and two of areas in Quebec.

Two maps were in the hands of the King's Printer at the end of the year and maps of six areas in the Northwest Territories, one in Yukon, one in British Columbia, twenty in Alberta, one in Manitoba and Saskatchewan, one in Manitoba, seven in Ontario, three in Ontario and Quebec, seventeen in Quebec, and two in Nova Scotia were in varying stages of progress.

Considerable preliminary work was also undertaken for a geographical and geological compilation of the Dominion, on a scale of 1 inch to 10 miles. Twelve projections for the Glacial Map of North America were plotted and completed on a scale of 1 inch to 40 miles. Forty-four map and other figure drawings were prepared for reproduction by zinc-cut process for illustrating reports, papers, and memoirs; other draughting and related work necessary for staff, war departments, and public use amounted to fifty-nine items.

Geographic Board of Canada

The Geographic Board consists of seventeen members, nine of whom are officers of the Federal Government and represent three departments, namely, Mines and Resources, National Defence, and Transport. The remaining eight are Provincial members, and represent, respectively, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, New Brunswick, Prince Edward Island, and Nova Scotia. Quebec has its own Board to deal with geographic names in that province, but is in direct contact with the Federal Board. The secretary is provided by the Bureau of Geology and Topography.

The Board has functioned for 41 years, during which period its primary object of working towards a sound uniformity in the naming of geographic features in Canada has been maintained.

The principle of preserving names originally given to geographic features by explorers, settlers, and others connected with the historical development of the country has been upheld, and so likewise, the establishing of appropriate names for the many unnamed features in recently surveyed areas.

During the year, place-names for seventy-five maps and charts were submitted for the final consideration of the Board, and the usual inquiries received attention.

NATIONAL MUSEUM OF CANADA

The National Museum is made up of Divisions dealing with Anthropology, Biology (including the National Herbarium), and related phases of the natural history of Canada.

Because of the war, no field work was done. Special attention was given instead to the systematic study of specimens and records on hand and to educational work. The latter was carried out through the medium of correspondence, the loan of specimens, the distribution of motion pictures and lantern slides, and the expansion of the Museum lecture series at Ottawa.

Grateful acknowledgment is made to friends of the Museum who so generously contributed towards exchanges, donations, and other forms of co-operative assistance.

ANTHROPOLOGICAL DIVISION

D. Jenness, Chief of the Division, revised and edited notes and manuscript material left by the late W. J. Wintemberg. On June 13 he was loaned to the Royal Canadian Air Force to assume the duties of Deputy Director of Intelligence, but retained his office at the Museum, and was thus available for consultation. He arranged for a joint meeting between an Indian-Eskimo Committee of the Canadian Handicrafts Guild, Montreal, and officials of the Indian Affairs Branch and Northwest Territories Administration.

C. M. Barbeau was engaged chiefly in preparing an extensive monograph entitled "Haida Carvings in Argillite," to be accompanied by many illustrations. He also assisted several organizations in various projects, particularly the Canadian Film Board, which he helped to record some 400 French Canadian and English Canadian folk-songs on electrically operated disks. He assisted the Board also in preparing two other films, one entitled "Maple Sugar," and the other "Canadian Handicrafts." Similarly, he assisted Mr. and Mrs. Crawley with their film "Portage" (early transportation), compiled for the Canadian Geographical Society; and the Arts Association of Montreal in organizing an exhibition of Old Quebec Arts, during the 3 summer months. With J. D. Leechman's assistance, he selected 200 of the best records of French Canadian folk-songs and forwarded them to the Library of Congress, Washington, for electrical reproduction and conservation. The original records will be returned, together with a complimentary set of reproductions.

The following items were added to the French Canadian folk lore collections: 314 folk-songs with texts and melodies; 125 folk-songs with texts; phonograph records of 22 fiddle and dance tunes; 100 photographs illustrating arts and handicrafts; and miscellaneous other records. Mr. Barbeau completed some manuscripts on French Canadian folk tales, nursery rhymes, and children's games, which are to be published in Montreal.

J. D. Leechman and W. G. Roberts installed special exhibitions of war photographs and war posters during the summer and winter months, and arranged a special exhibit for the Canadian Geographical Society on the occasion of its annual meeting. The former prepared a report on two Dorset Eskimo sites that he excavated in the Hudson Bay region during 1935 and 1936, and submitted this report to the journal *American Antiquity*. He wrote a short paper, published by the journal *American Anthropologist* in its January issue, on the haliotis shells used by the British Columbia Indians, and prepared a short guide to the Ottawa museums for the Canadian Travel Bureau. He also finished three reports left by the late W. J. Wintemberg, by gathering such illustrations as were needed and checking the titles and numbers against the text.

Classes from the public schools and from the Ottawa Normal School visited the Museum as in other years and were conducted through the exhibition halls by Mr. Leechman. He also supplied information to visitors and correspondents on a variety of topics, from Indian music and early Canadian silver to the making of moving pictures in sub-zero temperatures.

BIOLOGICAL DIVISION

R. M. Anderson, Chief of Division, continued research work on the scientific status, past and present distribution and abundance, ecological relations, and economic values of the mammal life of Canada. Forty-eight specimens were added to the mammal collections, mainly by gifts, but a few specimens were collected locally by members of the biological staff. On March 31, 1942, the catalogued collection of mammals totalled 17,145 specimens, largely of Canadian origin. In cataloguing zoological specimens in the National Museum, all parts of any individual specimen (skin, skull, skeletal parts, and material in liquid preservatives) are listed, labelled, and numbered under the same catalogue number, so that information is readily accessible.

Considerable progress has been made in specific and subspecific determination of specimens that had been in a doubtful status pending completion of biological surveys in various localities. Several new subspecies or geographical races have been recognized and their ranges provisionally delimited. Descriptions have been accepted for publication, and when published will add several new *types* of Canadian mammals to the National Museum collection. Many specimens were supplied with additional labels or revised names to accord with accepted modern zoological nomenclature. This permits many field notes, technical studies on specific characters and variations, and ecological notes to be segregated with greater precision in the files of mammal data. A check-list of Canadian mammals was prepared and partly rewritten and revised, particularly in the sections relating to "Range" or "Geographic Distribution" of each form known to occur in Canada. About 200 specimens were determined, bibliographical references looked up, and data verified from museum material for persons preparing preliminary faunal reports on several of the National Parks of Canada. Mammals acting as hosts to parasites were determined for the Institute of Parasitology, Macdonald College, and mammals were studied in connection with investigations by the Entomological Branch on the ravages of the European spruce sawfly in New Brunswick and eastern Quebec.

Austin L. Rand was appointed Assistant Zoologist and reported for duty on February 16, 1942.

Claude E. Johnson continued the labelling of biological specimens. A total of 3,858 mammal skulls and skins were labelled, and necessary revisions were added to the Catalogue of Mammals. He also made seven plaster

casts and seven rubber moulds of skulls of rare Canadian bears, including some types for the study collection; and he did some work on museum groups. His work on a large exhibit in the Museum illustrating the natural history features of the recently established Gatineau Park a few miles north of Ottawa involved the preparing of four large panels lettered and bordered for lists of plants, mammals, birds, reptiles, amphibians, and fishes; the making of 53 miniature coloured drawings to be placed on a large relief map; and of several large museum labels, which required hand lettering and colouring.

J. E. Perron prepared 534 skulls of mammals and skeletons for the osteological collections and tanned about twelve medium- and large-sized mammal skins.

Clyde L. Patch continued his work in the laboratories in repairing old mounted specimens and arranging new permanent and temporary exhibits. The laboratory and preparation facilities for taxidermy work were moved from the Motor Building, Sparks Street, to the old Mines Branch Building, Sussex and George Streets, in September.

A. E. Porsild was detailed for special duty with the Department of External Affairs, but until June 9, 1941, when he left the Division temporarily, he continued work in the National Herbarium. He returned December 26, 1941, and again took up his work on Canadian botany for the remainder of the fiscal year. Considerable progress was made on his reports on flora of Western Arctic Canada and descriptions of several new species and varieties of northern plants were prepared for publication.

Miss H. T. Harkness continued labelling, mounting, and inserting herbarium sheets in the permanent collection. A total of 1,855 sheets were mounted and several thousands were labelled. The mounted sheets increased the number of listed specimens in the National Herbarium to 162,281, exclusive of several thousands not yet determined and mounted. A total of 1,537 sheets were received on regular exchange, 191 on donation, 2,783 were sent on exchange, 866 plants were loaned, and 60 plants were borrowed for study purposes.

ORNITHOLOGICAL DIVISION

P. A. Taverner, Chief Ornithologist, reports that activities were confined to the study of existing collections, the revision of past work, and routine office work.

Detailed studies were made of the Hudsonian curlew, *Phaeopus hudsonicus*, and the great horned owl, *Bubo virginianus*, material for which has been desired in the museum for a number of years. The results of the former have appeared in the *Wilson Bulletin* for March 1942 and the latter will appear in an early publication of *The Auk*.

There were the usual number of inquiries from observers of all classes in Canada and abroad, some requiring considerable research to answer. The Canadian Bibliography of Birds was continued and more than 1,000 cards were filed and map-spotted. The usefulness of this bibliography is demonstrated almost daily in the answering of questions.

A. L. Rand devoted his time to ornithological studies. The ornithological collections were studied by a number of visiting ornithologists, and loans of material for study were made to other museums. Other institutions were liberal in loaning essential specimens to the National Museum.

The following accessions of ornithological specimens, by exchange and donations, are gratefully acknowledged:

Godthaab Seminarium, Godthaab, Greenland: 36 Greenland bird skins.
California Academy of Natural Sciences, San Francisco, California: 44 bird skins, 6 Canada geese (*Branta canadensis*), 32 shearwaters, *Puffinus*, of four species and 8 Pacific Coast quail of three species.
Museum Biological Division: 28 specimens, from Ottawa.
Porsild, A. E.: 6 Greenland birds.
Palæontological Division: domestic (?) goose, mounted skeleton.
Lloyd, Hoyes, National Parks Bureau: chimney swift, *Chaetura pelagica*, Ottawa, in flesh.
Whitmore, F., Ottawa: Cooper's hawk, *Accipiter cooperi*, Ottawa, in flesh.
Hyde, (?): long-eared owl, *Asio wilsonianus*, in flesh, found dead on C.N.R. train from Toronto.
Dorine, C., Ottawa: canary, in flesh.
Fauvel, F. A.: oven-bird, *Seiurus auracapillus*, in flesh, Ottawa.
Shipman, A. S., Ottawa: European starling, *Sturnus vulgaris*, in flesh, with greatly overgrown lower mandible, Ottawa.
Hoare, W., Ottawa: parula warbler, *Compsothlypis americana*, in flesh, Ottawa.
Shaffer, M.: love-bird, in flesh.
Bourguinon, A. E., Ottawa: knot, *Calidris canutus*, in flesh, Ottawa.
Clarke, C. H. D.: nighthawk, *Chordeiles minor*, in flesh, Ottawa.
Wiles, N. B.: red-tailed hawk, *buteo borealis*, in flesh, Ottawa.
Pegg, F. H., Glenlevis, Alberta: hoary redpoll, *Acanthis hornemanni exilpes*, flat skin, Glenlevis, Alberta.
National Parks Bureau: two sharp-tailed grouse, *Pedioecetes phasianellus*, in flesh, Jasper Park, Alberta.
Mousley, Henry, Montreal: small bird skins, Quebec.
Mathewson, Hon. T. Arthur: 9 Barrow's golden-eyes, *Glaucionetta islandica*, in various plumages, mounted, Rimouski, Quebec.
Royal Ontario Museum of Zoology, Toronto: chukar partridge, *Alectoris graeca*, from captivity.
Quion, N.: common loon, *Gavia immer*, Farrelton, Quebec, in flesh.
Curtis, M.: 5 ruffed grouse, *Bonasa umbellus*, Athens, Ontario.
Hennessey, T., National Parks Bureau: nighthawk, *Chordeiles minor*, Ottawa, in flesh.
Quinn, H. S.: ruby-throated hummingbird, *Archilochus colubris*, Ottawa, in flesh.
Campbell, J.: the same.
Malburn, M., Ottawa: parula warbler, *Compsothlypis americana*, in flesh, Ottawa.
Manning, T., British Arctic Expedition: 27 bird skins from southwestern Baffin Island.
Wilk, A. L., Camrose, Alberta: pigeon hawk, *Falco columbarius*, Millet, Alberta.
Tufts, R. W., Wolfville, Nova Scotia: great horned owl, *Bubo virginianus*, in flesh, Nova Scotia.

EDUCATIONAL WORK

The educational work is designed to give information and assistance to persons interested in anthropology, biology, and other phases of the natural history of Canada. This is provided through the medium of correspondence, publications, and visual aids, and through personal participation in the facilities of the Museum at Ottawa.

Much time was given to the identification of specimens, the loan of material, and the selection of photographs to illustrate scientific journals, school textbooks, and newspaper articles. Particular attention was given to the loan of motion pictures and lantern slides. These films and slides were seen by 188,808 persons during the year. Four new motion pictures were added to the Museum film library.

More than 150,000 persons visited the halls of the Museum, and, in addition, many thousands of junior and senior school pupils came in organized class study groups. These study groups were given special assistance and the personal attention of members of the staff. One group had a total attendance of 6,150.

Organized groups of tourists, advanced students, and student teachers were provided with guides qualified to describe and discuss the various exhibits. The systematic and study collections of the Museum were made available to visiting scientists and students.

NATIONAL MUSEUM LECTURES

The Museum organizes each year a program of lectures and motion pictures related to its activities, and to Canada's part in the world conflict. These lectures are given to adults on Wednesday evenings and, suitably adapted, to children on Saturday mornings. Four series were given, the subjects being:

The British Commonwealth at War (motion pictures).
Canada and Its People (motion pictures).
Here and There in the World (motion pictures).
North American Neighbours (motion pictures).
War Time Communications, by George Long, Bell Telephone Company of Canada, Montreal.
The War of Metals, by G. C. Monture, B.Sc., Department of Mines and Resources, Ottawa.
Our Sunset Province, by J. M. Humphrey, Vancouver.
Australia, by R. R. Ellen, Assistant Australian Trade Commissioner, Toronto.
Australia (motion pictures), shown in co-operation with the National Gallery and the National Film Society.
Canada's Army—Manpower Plus Machines, by Lt.-Col. W. W. Goforth, Headquarters Staff, Department of National Defence, Ottawa.
Motion Pictures in Colour, by F. R. Crawley, Ottawa.
Battle of the Airways, by Hartley Hunter, Canadian Westinghouse, Limited, Hamilton.
Down where the North Begins, by Charles Clay, Ottawa.
Pilots of To-morrow } by Wing Commander K. B. Conn, D.F.C., Headquarters Staff,
Quest for Wings } Royal Canadian Air Force, Ottawa.
The East Indies and New Guinea, by A. L. Rand, Ph.D., National Museum of Canada, Ottawa.

The total attendance at the Saturday morning lectures was 12,050 and at the Wednesday evening lectures, 9,475.

LECTURE HALL

The lecture hall of the Museum has a seating capacity of 598, and is equipped with motion picture projectors and a projection lantern. In addition to its use for the Museum lectures, there were 126 reservations of the hall by scientific or educational organizations. A total of 17,700 persons attended these meetings.

BUREAU OF MINES

The laboratories and other facilities of the Bureau were utilized mainly in work of direct war interest. Practically all of the investigations in the Physical Metallurgical Laboratories had to do with metallurgical problems affecting the production of war equipment and a large percentage of the investigations in the Ore Dressing Laboratories were on strategic minerals.

Much time was given to acquiring and preparing information for use of the Metals Controller, the Coal Administrator, and the Oil Controller, involving field investigations and surveys. In the work on industrial minerals, chief attention was given to those minerals urgently required in the production of munitions. There was a marked increase in activities arising from the administration of the Explosives Act owing to the large number of plants that have since been erected for the production of explosives.

During the fiscal year, 23,423 copies of Bureau of Mines reports, memorandum series, lists of mines, metallurgical works, etc., were distributed; 63,245 mimeographed sheets were printed, and 3,500 notification cards were sent out. A total of 1,006 French editions of the Bureau's publications were distributed by the Editorial Division.

ECONOMICS DIVISION

Inquiries received and answered related mostly to war minerals, and the mineral information service was freely used by the metals and other mineral controllers and by those directly concerned with the production of such minerals and with their application to war requirements. Special attention was given to those essential war minerals that Canada has heretofore mostly or wholly imported. The exigencies of the war, restricting and in some cases cutting off the flow of supplies from normal sources, and increasing the requirements of these minerals for the expanding armament program, have made it imperative that Canada's resources be explored and workable deposits brought into production with the minimum of delay.

A handbook, "Prospectors Guide for Strategic Minerals in Canada", compiled with the assistance of the geologists and engineers of the Branch and with the active co-operation of the Provincial Departments of Mines, was given effective distribution to prospectors. It was revised in the early winter, and a part of the second edition was available for distribution at the end of the year. One of the engineers devoted most of his time to studies and investigations related to the known deposits of the ores of tungsten, chromium, manganese, mercury, and molybdenum. About 3 months were spent on field examinations of deposits of the first three minerals in the Maritime Provinces, the Eastern Townships of Quebec, and in northern Ontario and Quebec. A visit was also made to the Canadian metallurgical plants using these minerals for the production of alloys, and reports were prepared for the information of the Metals Controller. This field investigation revealed the occurrence of scheelite, the principal Canadian ore of tungsten, in some of the gold mines of northern Ontario and Quebec in quantities sufficient to warrant geological examination and investigation to determine methods for its recovery in mining and milling operations. Samples of mill products obtained from fifty mines in Quebec, Ontario, and Manitoba were carefully tested and the mines that warranted attention were examined by geologists of the Bureau of Geology and Topography.

The annual survey of the deliveries of fuel oil and other petroleum fuels for consumption in the several provinces was continued. Compilation of the 1940 survey was completed in September and the tabulated summary of results was printed and distributed. This survey involved field work of 35 days in Quebec and Ontario, which also afforded first-hand information on developments in the distribution and use of the petroleum fuels. A summary review of the annual deliveries of the petroleum fuels for certain uses for the period from 1927 to 1940, or since the commencement of the survey, was compiled and manuscript copy prepared for the printer. These surveys, made for the information of the Dominion Fuel Board, are also useful to the Coal Administrator and the Oil Controller.

A summary review of Dominion tax and other legislation and of wartime control affecting mining in Canada was prepared for the information of the Provincial Departments of Mines and for distribution to those likely to have a speculative interest in mining in Canada. Studies were also made of the probable effect of the deepening of the St. Lawrence Waterway upon the movement of coal and crude petroleum into Canadian markets for the information of the Government in connection with the Canada-United States Agreement, awaiting ratification. A survey was made of the flotation reagents used in 1941 for the milling and treatment of Canadian ores for the information of the Metals Controller's office.

Special reports on mining properties were prepared for the information of the Deputy Minister in assisting the Commissioner of Income Tax in dealing with applications received under Section 89, Income War Tax Act, which

authorizes a 3-year exemption of new metalliferous mining companies from Dominion corporation tax from the commencement of commercial production. Reports were also prepared for the Deputy Minister on certain questions arising from the administration of that section of the Income War Tax Act, and in connection with the consideration of applications from oil drilling companies for benefits provided under Part III, War Exchange Conservation Act. Several reports were also prepared for the Deputy Minister in relation to applications made to the Minister of Finance for duty-free entry of certain apparatus required for new developments in mining.

Part of the time of one officer of the Division was occupied with work related to the administration of assistance authorized from Special War Appropriation for (a) the improvement under agreement with the Ontario Government of three mining road projects in that province; and (b) the granting of loans upon recommendation of the Metals Controller to mine operators to enable deposits of urgently required minerals to be brought into production.

Close to 1,000 inquiries for information on a wide variety of mining subjects were answered. Interviews were given to many callers in search of information pertaining to mineral resources, development, markets, etc., particularly in relation to war minerals. Articles or papers were prepared for publication by the press for presentation at meetings of technical organizations, or for departmental use.

Mineral samples received and reported upon included 25 examined for manganese, 10 for chromium, 30 for tungsten, 10 for molybdenum, 3 for diatomite, and 7 for other minerals.

The annual review of Canadian minerals for 1940 was made available for distribution in mimeographed form early in the fiscal year. Lists of the coal mines of Canada and of Canadian metallic mineral and industrial mineral milling plants were published, and the list of the non-ferrous metallurgical works in Canada and of the metallic mineral milling plants were in course of revision at the end of the year.

An Investigator, Grade IV, was transferred from the Development Division of the Bureau of Geology and Topography, but was later released on loan to the Department of Trade and Commerce for service with the newly created Export Control Sub-Committee. Three other officers of the Division continued on loan to other Departments on war work, its Chief and one engineer to the office of the Metals Controller, and a senior map draughtsman to the Gauge Division, National Research Council.

Library

The Librarian reports the following additions:

Books and pamphlets ordered	290
Bureau of Mines reports added to the circulating division	11
Canadian Government documents—individual issues (by exchange and gift)	2,739
British and Foreign Government documents—individual issues (by exchange and gift)	1,584
Scientific societies' bulletins, proceedings, and transactions—individual issues (by exchange and gift)	1,577
Periodicals (other than scientific societies and British and Foreign Government publications)—individual issues	1,987
Trade catalogues (by gift)	86
Periodicals and annuals subscribed for	211
Annuals, continuations, and periodicals (by gift)	433
Cards added to the catalogue	1,164
Volumes bound	152
Recorded loans	4,815

Draughting Section

The Draughting Section of the Bureau of Mines reports the following work performed:

Twelve maps were prepared and drawn for reproduction to be included in reports. Eighteen plans, diagrams, and mechanical drawings were also made for the Dominion Fuel Board, the Explosives Division, the office of the Metals Controller, and the Bureau of Mines. Further information was added to a considerable number of copies of the Mineral Map of the Dominion of Canada.

METALLIC MINERALS DIVISION

A co-ordinating committee was set up, consisting of representatives from the Navy, Army, Air Force, Department of Munitions and Supply, British Air Commission, Inspection Board of the United Kingdom and Canada, and the British Admiralty Technical Mission, in order that close co-operation be maintained between the Division and the Armed Services. A special war appropriation was granted to meet the need for additional staff and equipment. A liaison was also established with the British Central Scientific Office in Washington and, through that office, with the American ordnance activities. This was accomplished by maintaining a member of the staff on part time in the British Central Scientific Office in Washington, where he acted as technical adviser to that office on subjects relating to the production of armour plate, guns, tanks, ammunition, and all matters pertaining to the metallurgy of iron and steel and non-ferrous alloys. The Division was also active on procurement problems relating to strategic war minerals, the work being done in co-operation with the Metals Controller. The National Research Council co-operated with and assisted the Division on X-ray and radiographic examinations of castings and metal parts.

A large volume of work was done for the Inspection Board of the United Kingdom and Canada. Other organizations making use of the laboratories were: the Navy, the Army, the Air Force, the Department of Munitions and Supply, the British Air Commission in both the United States and Canada, the British Admiralty Technical Mission, and a number of industrial firms making armaments. Many of the problems necessitated research, in several cases on an extensive scale, as in the studies undertaken of armour plate, armour-piercing ammunition, and tank and carrier parts. The development of special armour-piercing small-arms projectiles was undertaken at the request of the Directorate of Small Arms and Ammunition.

The laboratories were used for checking and for the improvement and development of methods of heat-treating metals and alloys of various compositions. In several instances, large quantities of materials that had been condemned upon inspection were reclaimed by special methods of heat treatment devised in the laboratories.

At the request of the Department of Munitions and Supply the facilities for heat-treatment were made available to firms manufacturing gauges in the Ottawa district and thousands of these gauges were heat-treated.

Another helpful service was the providing of information on specification for alternative or substitute alloys. In the manufacture of munitions, the shortage of such metals as tin, tungsten, and vanadium necessitated many changes in specifications. Substitutes had to be found for Admiralty bronzes and for many other special alloys formerly used for specific purposes.

So much of the work was of a confidential nature that little can be said of the results obtained other than that many valuable improvements were made in armament materials. Most of the work in the Ore Dressing Laboratories

had to do with the problem of obtaining supplies of strategic minerals, and the number of gold ores handled was much less than in previous years.

Shipments of tungsten minerals, mostly scheelite from gold mines, were concentrated in the laboratories as a means of encouraging production. Beneficiation tests on chromite resulted in the erection of a mill on a property at St. Cyr, Quebec, and in plans for the erection of a 500-ton daily capacity mill on the Belanger property, near Thetford Mines in that province.

Magnetic separation tests were carried out on the ores from iron deposits along the Central Ontario Railway which were under development by Frobisher Exploration Company, Limited. The tests showed that these ores can be beneficiated satisfactorily.

Much work was done on the beneficiation and treatment of low-grade manganese ores; and some work was done on the ores of antimony, tin, mercury, copper, nickel, zinc, and molybdenum.

American Nepheline Corporation, in co-operation with Aluminum Company of Canada, Limited, devised a process in the Division's laboratories for the extraction and recovery of alumina, with potash and soda ash as by-products, from the extensive deposits of nepheline syenite in central Ontario. Full details were forwarded to the British Government for eventual use of the process in the extraction of alumina from English clays and from low-grade Irish bauxites.

Ninety-six investigations in the Physical Metallurgical Laboratories were reported upon but the titles of only five are listed below, as the remainder were of a confidential nature and had to do with work undertaken for the war departments and for industries engaged in the production of war equipment. Ninety-three investigations carried out in the Ore Dressing Laboratories were reported upon and the titles are listed. In addition to the above investigations, more than 500 information reports were issued directly to the Armed Services, and series of memoranda were prepared on such subjects as the organization of metallurgical work in the United States; the supersonic testing of metals; powder metallurgy; and reports of visits to leading armament firms in the United States and Canada.

Reports Nos. 1067 and 1067A (physical metallurgy list) were prepared to assist the small foundry operator in overcoming difficulties arising from a scarcity of raw materials. They were published in several technical journals and were widely distributed in response to requests. Report No. 1138 advocates the use of the side-blow converter to augment steel-foundry capacity in grey iron foundries. The steel so made could be used in many ways, thus releasing the electric furnace for the production of special steels.

List of Physical Metallurgical Investigations Reported Upon

(This list does not include titles of confidential reports)

No. 1067. Pig iron conservation in grey iron foundries.
No. 1067A. Comments on scrap iron conservation and substitution.
No. 1079. Testing of clays for use in synthetic moulding sand.
No. 1120. Information on powdered iron production and fabrication.
No. 1138. Some practical consideration of the use of side-blow converters in the present emergency.

List[1] *of Ore Dressing Investigations Reported Upon*

949. Gold ore from Siscoe Mines, Limited, Siscoe, Quebec. (January 25, 1941.)
953. Black sand concentrate from Compton County, Quebec. (Moe River Gold Mines, Limited.) (January 31, 1941.)

[1] Investigations Nos. 1004, 1018, 1019, 1072, and 1122 are on tungsten; 1051, 1068, and 1090, on chrome; 995, 1025, 1037, 1042, 1045, 1064, 1095, 1096, and 1100, on iron ores; 987, 1016, 1060, 1091, 1111, and 1128, on manganese; 961 and 1063, on copper ores; 983 and 1081, on magnesite; 972, 1029, 1049, 1059, 1110, and 1140, on silver, lead, and zinc ores; 1005 and 1095, on nickel; 1017, on molybdenite; 1040, on cobalt; and 1098, on copper-zinc.

956. Cyanidation tests on a sample of gold ore from the Nakhodas mine at South Porcupine, Ontario. (February 8, 1941.)
958. Investigation on the concentration of the metallic portion of grinder dust submitted by Deloro Smelting and Refining Co., Ltd., Deloro, Ont. (February 11, 1941.)
961. Concentration of a gold-copper ore from the "Molly B" Mineral Claim of the Stewart Canal Gold Mines, Limited, Stewart, B.C. (February 17, 1941.)
963. Gold ore from the Robson Group of claims, Bonanza Basin, Bridge River, British Columbia. (February 28, 1941.)
967. Mill products from Regnery Metals, Alden-Goudreau property, Algoma District, northern Ontario. (March 10, 1941.)
969. Concentration and cyanidation of arsenical gold ore from the Domineer Claims, Mount Washington, Vancouver Island, British Columbia. (March 13, 1941.)
970. Metallurgical tests on gold ore from Henning-Maloney Gold Mines, Limited, Flin Flon, Manitoba (C.I.L.). (March 31, 1941.)
971. Metallurgical tests on gold ore from Musketeer Mines, Limited, Bedwell River, Vancouver Island, British Columbia (C.I.L.). (March 31, 1941.)
972. Flotation concentration of the silver-lead-zinc ore of the Silversmith Mines, Limited, Sandon, British Columbia. (March 31, 1941.)
973. The extraction of gold from the auriferous concentrates of Nova Scotia. (Nova Scotia Technical College.) (March 10, 1941.)
975. Cyanidation and screen tests on a sample of mill tailing from Madsen Red Lake Gold Mines, Limited, Madsen, Ontario. (March 5, 1941.)
979. Concentration, amalgamation and cyanidation of an arsenical gold ore from Jewel Mineral Claim, Barren Lake, Lac du Bonnet mining district, Manitoba. (April 25, 1941.)
981. Results of investigations of amalgamation and cyanidation on samples of jig concentrates and amalgamation residues from Upper Seine Gold Mines, Ltd., Atikokan, Ontario. (March 20, 1941.)
983. Investigation on the concentration of magnesite rock from Canadian Refractories, Ltd., Kilmar, Quebec. (Section 1, March 25, 1941; Section 2, final, July 5, 1941.)
984. Gold ore from the Pamon Gold Mines, Limited, Beaver Lake, Saskatchewan. (April 2, 1941.)
987. The concentration of manganese ore from Grindstone Island, Magdalen Islands, Quebec. (Magdalen Manganese Mines.) (March 8, 1941.)
989. Investigation on the settling characteristics of a thickener pulp and mill feed ore submitted by the Leitch Gold Mines, Limited, Beardmore, Ontario. (April 1, 1941.)
992. Roasting of flotation concentrates from McMarmac Red Lake Gold Mines, Limited, and cyanidation of the calcines. (April 30, 1941.)
993. Sink-and-float tests on a sample of gold ore from Mount Zeballos Gold Mines, Ltd., Zeballos River area, British Columbia. (April 9, 1941.)
994. Cyanidation of a gold ore from Bonetal Gold Mines, Limited, Pamour, Ont. (April 30, 1941.)
995. Magnetic concentration and microscopic examination of iron-bearing material from the Burmis titaniferous iron deposit, Crowsnest Pass, Alberta. (N. H. C. Fraser, Ventures, Ltd., 2810-25 King Street W., Toronto, Ontario.) (April 30, 1941.)
996. Metallurgical tests on gold ore from Sturgeon River Gold Mines, Limited, Nezah, Ontario. (C.I.L.) (April 21, 1941.)
1002. Amalgamation and cyanidation of a gold ore from Gold Frontier Mines, Limited, Red Lake, northern Ontario. (H. W. Shoemaker, 45 Richmond St. W., Toronto, Ontario.) (May 14, 1941.)
1003. Microscopic examination of two specimens of gold ore from De Santis Porcupine Mines, Limited, Timmins, Ontario. (April 24, 1941.)
1004. Concentration of scheelite from ore of A.M. Mining Syndicate, Gilmore Lake, Beaulieu River area, Northwest Territories. (April 30, 1941.)
1005. Infrasizer tests on mill products from Falconbridge Nickel Mines, Limited, Falconbridge, Ontario. (May 1, 1941.)
1006. Concentration and amalgamation of a gold ore from the Bandolac Mining Company, Limited, Shebandowan Lake, Thunder Bay district, northern Ontario. (May 30, 1941.)
1012. Infrasizing tests on mill products from MacLeod-Cockshutt Gold Mines, Limited, Geraldton, Ontario. (May 14, 1941.)
1013. Concentration and cyanidation tests on a sample of gold ore from the Preston East Dome Mines, Limited, South Porcupine, Ontario. (May 14, 1941.)
1014. Concentration of fluorite in a barite-fluorite-calcite rock from Lake Ainslie, Inverness County, Nova Scotia. (H. B. Gillis, Dominion Steel and Coal Corp., Ltd., Sydney, N.S.) (May 22, 1941.)
1016. Concentration of a siliceous manganese ore from Amherst Island, Magdalen Islands group, Quebec. (Robert F. Hardy, 45 Richmond St. W., Toronto.) (June 30, 1941.)
1017. Concentration of molybdenite from the ore of Norwin Molybdenite Mines, Limited, Breckenridge, Quebec. (May 22, 1941.)

1018. Concentration of scheelite ore from Hollinger Consolidated Gold Mines, Limited, Timmins, Ontario. (May 22, 1941.)
1019. Concentration of scheelite ore from Edwin Phillips, Minto Mines, Quebec, Bridge River area, British Columbia. (March 22, 1941.)
1023. Concentration and amalgamation of gold ore from the Buccaneer mine, Clayoquot Mining Division, Vancouver Island, British Columbia. (H. L. Hill.) (June 10, 1941.)
1024. Beach sands from Black Bay, Lake Superior, Ontario. (Robert W. Adams, Duluth, Minn.) (June 7, 1941.)
1025. Magnetic concentration of magnetite and hematite from the property of the Bristol Iron Mines, Bristol, Quebec. (K. N. Stewart, Frobisher Exploration Co., Toronto.) (June 10, 1941.)
1028. Flotation of nepheline syenite from the Lakefield and Bancroft areas of Ontario. (F. R. Archibald, American Nepheline Corporation, Lakefield, Ontario.) (June 30, 1941.)
1029. Flotation of zinc ore from the Calumet mine, Campbell's Bay, Quebec, for smelting tests. (June 30, 1941.)
1030. Concentration of a gold-silver-copper ore from the Hunter Basin property of the Conwest Exploration Company, Limited, Telkwa, British Columbia. (July 18, 1941.)
1032. Cyanidation and concentration tests on gold ore from Snow Lake, Manitoba. (K. W. Fritzsche.) (June 30, 1941.)
1034. Flotation concentration of a sylvite in a sylvite-halite product from a fractional-crystallization of a brine from the Malagash Salt Company, Malagash, Nova Scotia. (June 25, 1941.)
1036. Roasting and cyanidation tests on a sample of arsenical gold ore from Lapa Cadillac Gold Mines (1937), Limited, Heva River P.O., Quebec. (July 14, 1941.)
1037. Magnetic concentration of magnetite ore from the Childs Iron Mine, Bancroft, Ontario. (Frobisher Exploration Company.) (July 4, 1941.)
1039. Concentration of a gold ore from the mine dump of the Relief Arlington Mine, Ymir area, Nelson District, British Columbia. (July 14, 1941.)
1040. Treatment of cobalt concentrate from mills in the Cobalt District of Ontario. (S-2.) (July 2, 1941.)
1042. Concentration of magnetite from the Rankin Iron Mines, Hastings County, Ont. (Frobisher Exploration Co., Ltd.) (July 4, 1941.)
1044. Report on sink-and-float tests on samples of gold ore from the Omega mine at Larder Lake, Ontario. (July 5, 1941.)
1045. Concentration of magnetite from the Bessemer mine, Hastings County, Ontario. (Frobisher Exploration Co., Ltd.) (July 5, 1941.)
1049. Flotation concentration of copper-lead-zinc-silver ore from the Shefford Gold Mines Company, Limited, Lake Megantic, Frontenac County, Quebec. (July 14, 1941.)
1051. Concentration of chromite from the Sterrett Property, St. Cyr, Richmond County, Quebec. (Chromite, Limited.) (July 15, 1941.)
1059. Sink-and-float tests on a sample of silver-lead-zinc ore from Silversmith mine at Sandon, B.C. (August 5, 1941.)
1060. Concentration of manganese ore from Nabco Manganese Mining Company, Limited, Elgin, Albert County, N.B. (August 6, 1941.)
1063. Sink-and-float tests on a sample of low-grade copper ore from Granby Mines at Copper Mountain, British Columbia. (August 15, 1941.)
1064. Coarse cobbing concentration of magnetite from Bessemer mine, Hastings County, Ontario. (August 19, 1941.)
1065. Concentration and cyanidation of gold ore from Snowshoe Gold Mines, Limited, Wells, British Columbia. (August 14, 1941.)
1068. Concentration of chromite from Belanger Chrome mine, Thetford Mines, Quebec. (August 19, 1941.)
1071. Crushed graphite crucibles from the Canadian Foundry Supply and Equipment Company, Montreal, Quebec. (Metals Controller's file.) (August 19, 1941.)
1072. Concentration of scheelite from the ores of the Petosa and Manley Mines, in Northwestern Quebec. (August 19, 1941.)
1073. Amalgamation and cyanidation tests on samples of arsenical gold ore from Preview Mines, Limited, at Contact Lake, Saskatchewan. (August 25, 1941.)
1076. Amalgamation and cyanidation of a gold ore from Negus Mines, Limited, Yellowknife, N.W.T. (August 22, 1941.)
1081. Sink-and-float tests on a sample of magnesite from the cull dump of Canadian Refractories, Limited, property at Kilmar, Quebec. (September 2, 1941.)
1082. Analysis, cyanidation, and concentration of mill products from Arntfield Gold Mines, Limited, Arntfield, Quebec. (September 2, 1941.)

1083. Concentration of a gold tailing from the Cordova mine, Hastings County, Ontario. (September 9, 1941.)

1084. Graphite ore from Lot 21, Ranges X-XI, Lochaber Township, Papineau County, Quebec. (August 30, 1941.)

1085. Graphite ore from Lot 22, Range X, Lochaber Township, Papineau County, Quebec. (September 2, 1941.)

1086. Magnetic removal of barren magnetite from the mill feed of Wood Cadillac Mines, Ltd., Cadillac, Quebec. (September 5, 1941.)

1090. Concentration of channel samples representing the ore-bodies of Chromite, Limited, at St. Cyr, Quebec. (September 11, 1941.)

1091. Gravity and flotation concentration of manganese ores from Sussex Manganese Mining Company, Limited, Sussex, New Brunswick. (December 9, 1941.)

1093. Mill tailing from the property of the Goldwood Gold Mines, Regina Bay, Lake of the Woods District, Ontario. (J. D. Shannon.) (December 9, 1941.)

1095. Magnetic and flotation concentration of nickeliferous pyrrhotite ore from Ontario Nickel Corporation mine at Moose Lake, Sudbury District, Ontario. (October 9, 1941.)

1096. Magnetic concentration of magnetite ore from Childs Iron mine, Hastings County, Ontario. (Frobisher Exploration Co.) (September 22, 1941.)

1097. Concentration and cyanidation of a gold ore from Cournor Mining Co., Perron, Quebec. (September 22, 1941.)

1098. Sink-and-float tests on a sample of copper-zinc ore from Normetal Mine at Dupuy, Quebec. (September 24, 1941.)

1100. Investigations on a manganiferous iron ore from Sault Ste. Marie District, Ontario. (C. W. Greenland, 779 Bayview Avenue, Toronto, Ontario.) (September 29, 1941.)

1107. Gold ore from Loon Lake, near Espanola, Ontario. (Mr. E. McElwain.) (October 9, 1941.)

1108. Infrasizing and superpanning tests on flotation tailing from Tombill Gold Mines, Ltd., Geraldton, northwestern Ontario. (October 24, 1941.)

1110. Sink-and-float tests on a sample of lead-zinc ore from Bluebell Mine at Riondel, B.C (Consolidated Mining and Smelting Co.) (October 25, 1941.)

1111. Manganese ore from near Lake Charlotte, Nova Scotia. (Mr. Reg. Charlick, Guysboro Mines, Ltd., Goldenville, N.S.) (October 27, 1941.)

1114. Gold ore from Leitch Gold Mines, Limited, Beardmore, Ontario. (November 19, 1941.)

1116. Gold ore from Central Cadillac Gold Mines, Limited, Cadillac, Quebec. (November 28, 1941.)

1119. Mill tailings from Trout Lake, B.C. (J. M. Tillen.) (November 11, 1941.)

1121. Amalgamation and flotation concentration of a gold-copper ore from Siscoe Gold Mines, Ltd., Siscoe, Quebec. (November 28, 1941.)

1122. Scheelite ore from Consolidated Nicola Goldfields, Limited, Stump Lake area, British Columbia. (November 17, 1941.)

1123. Investigation on the suitability of Tallol reagents as frothing agents in flotation of sulphide and gold ores. (Consolidation Paper Corporation.) (December 26, 1941.)

1124. Sink-and-float tests on a sample of galena-gold ore from Sops Arm, White Bay, Newfoundland. (British Metals Corp. (Canada), Ltd.) (May 12, 1941.)

1127. Sink-and-float tests on samples of gold-bearing cobalt-nickel ore from Latchford, Ontario. (H. Shakt mine). (December 12, 1941.)

1128. Gravity concentration of manganese ore from A. W. Haddock, Williams Lake, British Columbia. (November 26, 1941.)

1134. Gold recovery from the cobalt-nickel ore from the H. Shakt mine, Township of Coleman, Trout Lake area, Ontario. (J. M. Forbes.) (December 24, 1941.)

1139. Experimental tests on gold ore from the Aetna prospect in Sudbury mining area, Ontario. (Wright-Hargreaves Mines, Limited.) (December 30, 1941.)

1140. Experimental tests on gold-silver-lead-zinc ore from the A and E Group on Carnes Creek, Revelstoke mining division, B.C. (Andrew Kitson.) (December 27, 1941.)

During 1941, 6,776 samples were received and reports of analyses were issued on all samples completed; 22,042 determinations were made on these samples, in which approximately 45 different mineral constituents were involved.

The samples were made up from the following:

	No. of samples	Per Cent of total
Metallic mill products	5,180	76·45
Industrial Minerals Division	397	5·87
Division of Economics	74	1·10
Pyrometallurgical Laboratory	80	1·18
Bureau of Geology and Topography	108	1·60
Miscellaneous	143	2·11
Department of National Defence	147	2·16
Inspection Board of United Kingdom and Canada	287	4·23
British Air Commission	106	1·56
National Research Council	59	0·87
Fuel Testing Laboratories	16	0·53
Department of Munitions and Supply	10	
Department of Transport	6	
Department of Public Printing and Stationery	4	
Custom assays and analyses	159	2·34
	6,776	100·00
Total determinations	22,042	
Total gold assays	4,304	19·52
Total silver assays	542	2·46

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

Department	No. of samples	Determinations
Department of National Defence	147	1,416
Inspection Board of United Kingdom and Canada	287	3,203
British Air Commission	106	1,229
National Research Council	59	466
Department of Munitions and Supply	10	65
Department of Transport	8	67
Pyrometallurgical Laboratory (Samples from problems related to war supplies production)	80	642
	697	7,088

From the viewpoint of the time required to make the determinations, this represents 32·1 per cent of the work of the Chemical Laboratories' staff.

INDUSTRIAL MINERALS DIVISION

The Division is concerned with the industrial, or non-metallic minerals, such as asbestos, feldspar, mica, magnesite, gypsum, salt, and talc, as well as building stones, road metal, clay, bentonite, and industrial waters. The three sections of the Division deal respectively with: the resources of industrial minerals, their economic characteristics, mining, marketing, and use; the crushing, grinding, and purification of the minerals; and problems of processing in the manufacture of mineral products, particularly ceramic products.

As in the previous year the activities of the staff were devoted mainly toward promoting the development of those minerals required in the production of munitions and to supply deficiencies caused by the restrictions on imports. Throughout the year, officers of the Division were in close co-operation with the Department of Munitions and Supply and much of the field work was conducted at the request of the Metals Controller. Services were rendered to the Departments of National Defence, National Revenue, Trade and Commerce, and other Dominion and Provincial bureaux.

Field investigation on occurrence, mining, preparation for market, and industrial uses were conducted on apatite, beryl, brucite, feldspar, fluorite, graphite, limestone, mica, nepheline, salt, talc, china clay (kaolin), silica sand, peat, and other minerals.

Inquiries on various mineral subjects, dealt with by correspondence and direct consultation, showed a marked increase; and an unusually large number of mineral samples were received for examination and report on their possible economic value.

Field inspections were made of operations in Ontario and Quebec for beryl, feldspar, fluorite, graphite, mica, nepheline syenite, phosphate, and talc and soapstone. Several graphite prospects were examined and reported on for their possible economic value.

Special memoranda were prepared on the status of the fluorite, graphite, and mica mining industries for use of the Metals Controller in connection with the possibility of increasing the production of these minerals for defence needs. A large number of samples of phlogopite mica from different properties in Ontario and Quebec were tested to determine their heat resistance and possible suitability for use in the making of aviation spark-plugs. Laboratory tests were also made on samples of altered biotite mica, collected in the course of field work, to determine whether they showed exfoliation properties comparable to vermiculite; none of the material, however, proved of value.

Investigational work was continued on brucite, magnesite, hydromagnesite, dolomite, magnesitic dolomite, limestone, asbestos, marl, serpentine, whiting substitutes, and Iceland spar, with special attention to minerals and rocks that are sources of magnesia and magnesium.

A survey was made of the magnesia situation in the United States and Canada in respect of supplies for Canadian industry, and close touch was maintained with developments in the production of magnesia and magnesium in the United States.

Much advice of a technical nature was given Aluminum Company of Canada, Limited, on its plant design and quarry development in connection with the development of the brucitic limestone deposits in the vicinity of Wakefield, Quebec. The plant will use the process developed in the laboratories of the Division for the recovery of magnesia and lime.

Co-operation was given to the National Research Council and to Dominion Magnesium, Limited, in experimental work on the production of magnesium metal from dolomite by reduction with ferrosilicon. Information was supplied on dolomite deposits in Eastern Canada, and about 100 tons of dolomite was calcined, crushed, pulverized, and briquetted to supply material for pilot runs at the Research Council Laboratories.

At the request of the Lands, Parks and Forests Branch a survey was made along the route of the main highway through Cape Breton Highlands National Park, Nova Scotia, to determine the suitability of local materials for use in the construction, improvement, and maintenance of the park roads. The use of gypsum and anhydrite for improving the stability of road surfaces was also investigated. Samples of gravel from Banff and Jasper Parks, Alberta, were tested.

Laboratory tests were made for the Department of Transport on soils from the Goose Airport, Northwest River, Labrador, and on clays from Prince George, British Columbia.

At the request of the Department of National Defence, soils at Camp Sussex, New Brunswick, were examined, and laboratory tests were conducted on samples from the Camp roads to determine whether the soils could be successfully stabilized by treatment with Portland cement.

Information was furnished the Naval Service on the best sources of certain types of rock in Canada.

Peat moss deposits in Nova Scotia, Prince Edward Island, New Brunswick, Quebec, and Ontario were investigated and a report was prepared for publication. The Black Point bog in Digby County; Twin Plain and two small bogs at the headwater of the Tidnish River, in Colchester County, Nova Scotia; and

three bogs at Jolicure Lakes in Westmorland County, New Brunswick, were examined in detail. The quality and the quantity of the moss strata were determined and contour maps were made of the deposits. Eleven other bogs in New Brunswick, Quebec, and Ontario were sampled and analyses were made to determine the quality of the moss. Two peat moss plants in Quebec and three in Ontario were visited and reported upon, in continuation of the investigation of Canadian peat moss deposits commenced late in 1939.

The investigation of industrial waters was continued; 45 samples of surface and civic waters in Nova Scotia, New Brunswick, Prince Edward Island, and Quebec were collected and analysed. The waters of the Petitcodiac Basin and a system of lakes north of St. Andrews, New Brunswick, were investigated for the Fisheries Research Board of Canada.

Members of the staff served on various Government and other committees, the activities of which are closely associated with the work of the Division.

INDUSTRIAL MINERALS MILLING LABORATORIES

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

Apatite. Concentration tests on a 600-pound sample of apatite rejects from Buckingham, Quebec, for Commercial Mineral Products, Limited.

Asbestos. Pneumatic concentration tests of asbestos fibre on a series of small samples, diamond drill cores, and on two 1-ton samples from Asbestos Crude and Fibre Mines, Limited, Thetford Mines, Quebec.

Concentration of asbestos fibre from two samples of 5 tons and 3½ tons for Canadian Refractories, Limited, Kilmar, Quebec.

Asbestos Tailing. Concentration tests for the removal of iron minerals from asbestos tailing of Johns-Manville Asbestos Corporation, Asbestos, Quebec.

Bauxite. A sample of bauxite from Aluminum Company of Canada, Limited, was dried, crushed, and screened, preparatory for tests in the Ceramic Laboratories.

Brucite. Six samples—about 30 tons—of brucitic limestone from properties in Ontario and Quebec were processed for Aluminum Company of Canada, Wakefield, Quebec.

Sixty 50-pound samples of brucitic limestone from Aluminum Company of Canada were crushed and sampled for chemical analysis.

Concentration of brucite by flotation on small samples of brucitic limestone from Farm Point, Quebec, for Canadian Refractories, Limited.

Jigging, tabling, and flotation concentration tests for the removal of siliceous minerals and lime from magnesia.

Barite. Screen analysis, $BaSO_4$ content, and water solubility were determined on a sample submitted by Canadian Industrial Minerals, Limited, Walton, Nova Scotia.

Bentonite. Seven samples of bentonitic clay and two samples of foundry sands from Pembina Mountain Clays, Limited, Winnipeg, Manitoba, were compared as to their relative bonding qualities for synthetic moulding sands.

Carborundum. Much work was done on the washing and classification of used grain carborundum.

China Clay. Moisture, clay, and silica content were determined, and the removal of iron impurities by means of a Ferro-Filter was carried out on three samples of china clay from Canada China Clay and Silica, Limited, St. Remi d'Amherst, Quebec.

An extensive laboratory study of the factors affecting the dispersion and flocculation conditions of china clay was made, to show the necessity for the use of reagents. Using the best conditions indicated by the small-scale tests, a final clay-refining test was made to serve as a guide to operations at the Lac Remi plant. The resulting silica by-product was further processed by washing, magnetic separation of the iron impurities, and screening, to confirm previous test work on the grade of glass sand the property could produce.

Dolomite. Several samples of dolomite and dolomitic limestone, totalling 70 tons, were crushed, screened, calcined, ground, and briquetted for Dominion Magnesium, Limited, Renfrew County, Ontario, to be used in its experimental investigation of producing magnesium metal at the National Research Council Laboratories.

Feldspar. A 400-pound sample of feldspar from Point St. Charles, near Seal Harbour, Quebec, was ground to pass 200 mesh for W. E. Dudley, Chicago, Illinois.

Fluorite. Jigging and table concentration tests were made on three samples of fluorspar for Reliance Fluorspar Mining Syndicate, Madoc, Ontario.

Gravity concentration tests were made on a small sample of fluorspar from Madoc for Woodland Mineral Company, Hamilton, Ontario.

Garnet. Abrasive quality of a sample of garnet was determined for W. A. Yarwood, River Valley, Ontario.

Samples of garnet from T. B. Tough, Burks Falls, Ontario, were crushed and screened to determine if the products are suitable for sand blasting.

Ilmenite. Air table and magnetic concentration tests to separate ilmenite from feldspar were made on a sample from St. Jerome Township, Charlevoix County, Quebec, for E. I. Du Pont de Nemours and Company, Wilmington, Delaware.

Magnesite—Calcined. Seven hundred and ten pounds of stored calcined magnesite from Canadian Refractories, Limited, was dehydrated.

Magnesite. Two 8-ton samples of a magnesitic dolomite-serpentine ore from Canadian Refractories, Limited, were crushed to minus 1½ inches. Sink-and-float concentration tests were made to recover a product that would meet lime, silica, alumina, and other such specifications.

Mica. Screen analyses on two samples of ground mica from Blackburn Brothers, Limited, Ottawa.

Concentration of mica by crushing and screening, and tabling of a sample for Paul d'Aragon, Montreal, Quebec.

Pegmatite Rock. Seven samples of pegmatite rock from J. H. Larmarche, Mont Laurier, were crushed for spectrographic analysis.

Quartz. Table, and magnetic removal of iron impurities from a sample of quartz from Verona, Ontario, for S. A. Price, Toronto.

Quartzite. Testing consisting of crushing, washing, magnetic separation, and acid leaching was carried out on a sample of quartzite from Kamouraska, Quebec, for Dr. Arthur Beauchesne, Ottawa.

Salt. An investigation was under way for the removal of anhydrite particles from a sample of salt submitted by Malagash Salt Company, Malagash, Nova Scotia.

Sand—Silica. In addition to the work on china clay for Canada China Clay and Silica, Limited, tests were made on the silica product to determine its suitability as foundry sand and glass sand.

Screen analyses on three samples of sand from Souris, Prince Edward Island, for Ferro Enamels Canada, Limited, Ottawa.

Moisture determinations on three samples of sand submitted by Ottawa Silica and Sandstone, Limited, East Templeton, Quebec.

Preliminary tests on five samples of sand submitted by James B. Harkas, Sarnia, Ontario.

Sand—Moulding. Five samples of sand were examined as possible moulding sands for the Board of Trade, Delhi, Ontario.

Samples of sand from Stanford, Ontario, were tested as core sand, for Queen City Sand and Supply Company, Buffalo, N.Y.

Samples of sand from St. Jérome, Quebec, were tested as moulding sand from M. I. Viau et Fils, Ltée, St. Jérome, Quebec.

Sandstone. Series of tests, concluding with a 3-ton plant test on samples of sandstone from near Joyceville, Frontenac County, Ontario, were conducted for A. D. Bartlett, Kingston. Testing consisted of crushing, washing, magnetic separation, and acid leaching, as a means of producing glass sand and foundry sand.

Crushing, washing, screen, magnetic separation, and acid leaching tests to produce a glass sand product were made on a sandstone sample from Bells Corners, Ontario, for A. Campbell, Ottawa.

Sericite. A sample of sericite from Sharbot Lake, Ontario, was crushed and ground for J. M. Balderson.

Serpentine. Crushing, grinding, and air separation of minus 325-mesh material, on a sample of serpentine submitted by International Magnesite Company, Calumet, Quebec.

Vermiculite. Crushing tests using a hammer mill were made on a sample of vermiculite submitted by Canadian Refractories, Limited.

The following services were rendered for other Government departments:

A sample of fluorspar was ground to 200 mesh for the National Research Council.

Six 2-ton samples of dolomite were crushed, screened, calcined, ground, and briquetted at the request of the National Research Council.

Fifty-three tons of sandstone from Bells Corners, Nepean Township, was crushed, screened, and washed for the Dominion Experimental Farm, Ottawa.

Numerous small samples were crushed and pulverized for chemical analysis.

Metal shapes were sand-blasted for the Metallic Minerals Division and for the National Research Council.

CERAMIC LABORATORIES

The investigation on the physical properties of Canadian structural tile was completed and the preparation of the final report for publication was under way.

Complete tests, for which charges were made, were carried out on four sample lots of building brick submitted by a large eastern manufacturer.

The investigation on the use of bauxite tailing to improve the refractoriness of firebrick was continued. So far, the results indicate the possibility of developing a method for producing a super-duty grade of refractories by the inclusion of bauxite tailing in fireclay, together with special processing methods.

Advice was given on the exploratory work being carried out on the kaolin deposit at Point Comfort, Quebec. The deposit appears to have possibilities as a source of fireclay for use in Quebec and Ontario, which have been importing all of their requirements. Tests and examinations were made on a large number of samples obtained from drillings on the property. Experimental firebrick were made from a large sample obtained from the deposit, and tests on the brick gave encouraging results.

Samples of various kinds of refractories were tested for the Naval Stores, Department of National Defence, and for the Department of Public Works, to ascertain their suitability for use in fireboxes of naval vessels, in stationary boiler installations, etc. Tests were also made on raw materials and finished products submitted by manufacturers of refractories in Canada.

At the request of a Canadian pottery manufacturing company, work was undertaken to develop a casting body for the making of artware that could be vitrified at a lower temperature than the bodies that had been used. A body meeting the requirements was developed and reported upon.

An investigation was started to determine the effectiveness of brucite and serpentine in reducing the coefficient of expansion of electrical porcelain bodies.

The possibility of producing a "lava" type electrical insulator of precise dimensions for military use, from Canadian raw materials (talc, soapstone, serpentine, etc.) was investigated. A synthetic "lava" product made from Canadian soapstone was developed that is considered to be satisfactory.

In connection with the work in the Milling Section on Lac Remi kaolin, information was gathered on methods of bleaching china clay that could not be washed to a sufficiently white colour, and some investigative work was started. Work was also undertaken on a sample of kaolin from a deposit in British Columbia to ascertain its possibilities as a source of china clay suitable for use by the pulp and paper trade on the western coast. The uncertainty of obtaining English paper clay on the western coast gives stimulus to the development of domestic sources of supply.

Bleaching tests were also conducted on Nova Scotia barite.

Tests were made on samples of uranium products produced by Eldorado Gold Mines, Limited, to ascertain their suitability for use in ceramic glazes.

Thirty-four samples of clays or shales, and nine samples of ochres were tested and reported upon.

The following petrographic studies were carried out in connection with investigations:

On samples of magnesitic dolomite from Kilmar, Quebec, to determine the minerals present, their average grain size, and the character of aggregation, as a means of finding the cause of inconsistent results in flotation tests. Twenty-five thin sections, powdered samples, and various flotation products were examined.

Brucite separation tests in the Milling Laboratories and the identification of minerals associated with brucite.

Clay washing experiments on samples of kaolin under investigation and the identification by petrographic methods of accessory minerals associated with kaolin.

The identification of accessory minerals present in various samples of silica sand or rock under investigation in the Milling Laboratories.

Determining the effectiveness of separation tests on samples of fluorspar, asbestos, etc., under investigation in the Milling Laboratories.

Determination of the degree of separation of magnesite and dolomite by heavy liquid separation tests on samples of magnesitic dolomite from Kilmar, Quebec. In addition, identifications or determinations of mineral content were made on 87 miscellaneous rock samples submitted by the public or by officers of the Bureau.

Information was given to the Department of Munitions and Supply, to the Naval Stores, and to the Royal Canadian Air Force, to serve as a guide in the purchase of tableware. Three sample lots of imported tableware (chinaware) and one sample lot of Canadian-made ware were subjected to various prescribed

tests to ascertain their suitability for use in the military services, officers' messes, etc.

Information was supplied to the Department of National Revenue to serve as a basis for classifying various ceramic articles for customs and excise tax purposes.

DIVISION OF FUELS

The Chief of the Division and senior technical officers again visited collieries, by-product coke plants, and oil and gas plants in the different parts of the country to discuss and to advise on technical problems. They attended committee meetings and conferences in Ottawa with other Government organizations relating to the testing of and research work on Canadian coals, petroleum oils, and natural gas. Reports were prepared and distributed to interested parties on: physical and chemical survey of coals from collieries in Alberta and British Columbia; burning tests on domestic-type fuels in Army camp-stoves including sub-bituminous and bituminous lump coals and briquettes; and coking characteristics of certain British Columbia coals for the production of by-product coke for metallurgical purposes.

Work of direct war interest included the investigation of coal tar and petroleum oil products for the greater production of toluene for use in explosives, and the testing of a large number of samples of coal and briquettes, and of oils, including gasolines, fuel oils, and lubricating oils submitted by the Department of National Defence and the Oil Controller.

The part-time services of five technical officers were utilized in a consulting capacity on work for the Army and Air Services of the Department of National Defence, Department of Munitions and Supply, and Office of the Coal Administrator. One engineer continued on transfer-loan to the Department of Munitions and Supply, another to the Office of the Oil Controller, a third to the Office of the Coal Administrator, and a fourth to the Department of Transport.

PURCHASE OF COAL BY SPECIFICATION

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

ANALYSIS SURVEY OF COAL AND COKE

As part of the investigational program, four series of samples of coal and coke were collected and the results of analyses reported. These comprised a total of 315 samples of coal and coke from 16 mines in Nova Scotia; 17 (Canadian and American) by-product coke plants; 10 mines in British Columbia, and 45 mines in Alberta. The last series included an analysis survey conducted jointly with the Fuel Department of the Canadian National Railways, the samples having been collected periodically during the year by inspectors of the Railway. The 255 samples submitted by the National Defence Department together with the 146 samples collected from dealers in Vancouver and Winnipeg afforded valuable information on the quality of the delivered coal in relation to seam and mine samples previously collected and examined. The results of analysis were of special value for the coal tender review work.

A pamphlet on Alberta coals, prepared in co-operation with the Office of the Coal Administrator, was published by the Wartime Prices and Trade Board

under the title "Alberta Coal for the Ontario Domestic Market". Technical officers also co-operated in the preparation of manuscript of a report entitled "50 Ways to Save Coal This Winter", and supplied considerable information to mining companies in northern Ontario and Quebec on the substitution of Alberta coals for imported coals.

COMBUSTION ENGINEERING INVESTIGATIONS

Routine weather studies in connection with the degree-day heating load for Ottawa were continued. The data are of value to the Coal Administrator's Office and to industrial firms in estimating fuel requirements.

A member of the staff made extended field studies of various fuels and heating problems in defence establishments, which work necessitated the preparation of numerous technical reports. Seven trips were made, covering 76 days travelling time. He served in an advisory capacity to the R.C.A.F. Headquarters Fuel Committee in Ottawa, and to the Coal Administrator's Office throughout the year. Another conducted a series of observation burning tests on various fuels in a station agent type stove such as is used in military hutments and other establishments of the Department of National Defence. The tests were on Onakawana lignite in different conditions of preparation; briquettes; and on one eastern and one western bituminous coal in lump form. They were made to establish the relative merits and general grading in respect to radiant heat, ease of control, burning rate, violent ignition (fire hazard), soot formation, and other factors. Tests were also made to determine the clinkering properties of samples of Canadian and American (buckwheat size) anthracite, and a process was developed for the treatment of coal and other solid fuels to produce a clinkering ash residue on combustion. Such treatment applies specially to buckwheat and stoker sizes used in blower-equipped furnaces with fixed grates. Several reports were prepared as a result of laboratory test work conducted throughout the year.

Two series of locomotive tests made during July and December on Onakawana lignite in admixture with bituminous coal were witnessed by an engineer of the Fuels Division. The tests were under the auspices of the Temiskaming and Northern Ontario Railway Commission, North Bay, and were fully reported.

COAL PREPARATION, STORAGE, CARBONIZATION, AND BRIQUETTING

The scope of the physical and chemical survey of bituminous coals from Canadian collieries was enlarged to comprise two parts similar to that conducted by the British Fuel Research Board. The first part, a fundamental study of coals as mined, included collieries in the Alberta Crowsnest area and was extended to the inland and island collieries in British Columbia. The collection and examination of ton-lot samples of coal as mined from these collieries almost completed this part of the survey for all Canadian collieries producing bituminous coal. Eight typewritten reports were distributed to interested parties, and Number Three: "Physical and Chemical Survey Report for Pictou County Coalfield, Nova Scotia," was issued in mimeograph form.

The second part of the survey consisted of the systematic collection and analysis of commercial grades of coal shipped from the collieries. Commercial grades were collected from the collieries visited in connection with part one of the survey and from collieries in Nova Scotia and Alberta. At all the collieries information was gathered and correlated concerning coal preparation and handling and distribution methods to aid in establishing uniformity in coal sizes and terminology.

Instructions for storing coal at military establishments were prepared for the Department of National Defence. A technical officer investigated

several railway coal piles that had ignited spontaneously, and issued a report on the probable cause of, and on methods of preventing such heating and firing.

Interest in briquetting increased with the establishment of two new plants in Western Canada, one of which is a high pressure process of binderless briquetting. A technical officer of the Division further investigated the application of this process to Onakawana lignite from northern Ontario, and the results of preliminary tests were encouraging. Studies were made of the amenability to briquetting of certain Vancouver Island coals and the application of new types of binders was investigated. Preliminary tests were conducted and advice was given on the briquetting of dolomite and ferro-silicate for the manufacture of magnesium by the Pidgeon process.

Laboratory tests on the coking characteristics of certain British Columbia coals were carried out to determine the availability of coals mined in that province for the production of metallurgical coke. Various studies were made in the laboratory on the physical characteristics of by-product and beehive coke, especially with regard to reactivity.

Special distillation tests were made on Nova Scotia oil-shale to obtain sufficient shale oil for large laboratory scale experiments on the recovery of important by-products. A survey of Canadian coke and gas plants was made to explore sources of new raw materials vital to and not already used in the defence industries.

HYDROGENATION AND ASSOCIATED HIGH-PRESSURE TESTS

Two coal hydrogenation reports, "Yields of Gasoline by Hydrogenation of Various Canadian Raw Materials" and "Cost of a Hydrogenation Plant for Producing Aviation Base Stock from Alberta Bitumen", based on previous experimental work at the Fuel Research Laboratories, were prepared for submission to the Committee on Substitute Fuels of the National Research Council and to the Oil Controller.

The experimental investigation on the dehydration of Onakawana lignite by high-pressure steam was completed and a comprehensive report was prepared for the Industrial Commissioner of Temiskaming and Northern Ontario Railway.

COAL TAR AND PETROLEUM OILS

A statistical report was prepared on the coal tar industry in Canada, in which connection analytical surveys and experimental investigations were made on the light oil and its derivatives. Reports on this and related subjects were distributed to the Department of Munitions and Supply and to other interested parties; a list of these reports follows:

"Survey of the Coal Tar Industry in Canada".
"Toluol Production from Light Oil in Canada".
"A Survey of Benzol Motor Fuel in Canada".
"Experiments on the Catalytic Desulphurization of Light Oil Recovered from Coke Oven Gas".

Experiments on the dehydration and demulsification of coal tar and certain crude petroleum oils were made and a report prepared describing a novel heat exchange apparatus and process for the continuous dehydration of such emulsified oil products developed in the Fuel Research Laboratories. A further investigation on the dehydration and viscosity breaking of crude oil from the Vermilion field in Alberta was conducted and reported.

An experimental study of the effect of different crankcase atmospheres on the deterioration of motor oil was in progress and preparations were made for a survey of imported crude oils as potential sources of toluene for use in explosives.

ROUTINE CHEMICAL LABORATORY WORK

As shown below, 1,765 samples of solid, liquid, and gaseous fuels were analysed, the examination of which involved some 12,700 separate chemical and physical determinations (mostly in duplicate) of the different items of analysis. The total included 205 samples of mine air from British Columbia and Alberta; 61 samples of lignite from northern Ontario; and 584 samples of coals and oils from the Departments of National Defence and Munitions and Supply. Although the analysis work conducted for these two departments shows an apparent increase from about 9 per cent to 33 per cent of the total, an additional large proportion of the samples pertaining to divisional investigations concerned special wartime services to the National Defence and other Government departments.

	Number of samples	Per cent of total
1. Samples pertaining to investigations of Fuels Division—		
Solid Fuels	479	27·1
Coals 451		
Cokes, peat, briquettes, and miscellaneous 28		
Liquid Fuels	96	5·4
Crude oils 11		
Gasoline, fuel oils, lubricating oils, etc 85		
Gases	17	0·9
Natural gas 5		
Manufactured gas, flue gas, and miscellaneous 12		
2. Samples from other divisions of Department of Mines and Resources (including 72 samples of peat from the Industrial Minerals Division)	83	4·7
3. Samples from other Government departments elsewhere—		
Department of National Defence—Army, Air, and Naval Services	405	23·0
Coals, cokes, and briquettes 255		
Gasoline, fuel oils, and lubricating oils 150		
Department of Pensions and National Health—		
Coals	49	2·8
Department of Justice (Penitentiaries Branch)—		
Coals	90	5·1
Department of Munitions and Supply (Oil Controller)—		
Gasoline	179	10·2
Other Government departments (including 43 samples of standard aviation fuels from National Research Council)	55	3·1
Provincial governments—mine air and lignite	270	15·3
Commercial firms, private individuals, etc	42	2·4
Total	1,765	100·0

EXPLOSIVES DIVISION

Owing to the increase in the Division's war activities, little time was available for routine work on commercial explosives. One inspector and two chemists were continuously occupied, in co-operation with the National Research Council, in the development of new explosives for war use. The inspector at Vancouver was moved to Ottawa to assist in handling the increased work owing to the large expansion of war industries in Eastern Canada.

Little difficulty was experienced in controlling the distribution of explosives by means of explosives purchase permits (Order in Council P.C. 2903, July 4, 1940), issued under supervision of the Division. The Division continued to co-operate with the Department of Munitions and Supply in the design and operation of war plants, the investigation of accidents, and in all other matters affecting the manufacture of explosives, the making of small arms ammunition, or the filling of shells, bombs, and similar ammunition. Close co-operation was maintained with the Royal Canadian Mounted Police, who gave valuable assistance.

Work was continued on the new Physical and Chemical Laboratories near Ottawa, mentioned in last year's report, but was delayed because of difficulty in obtaining materials.

FACTORIES

The manufacturers of fireworks were busily engaged in the production of military pyrotechnics and necessary commercial signals and there was only a small production of fireworks designed for display or amusement. Output figures for factories producing commercial explosives were about the same as in past years. Inspectors of the Division made 60 visits of inspection to factories.

ACCIDENTS

A fatal accident occurred in the shot-shell department of a factory making cartridges for civilian use. This was a most unusual accident and was the subject of lengthy investigation and report. It is believed that the precautions since taken will be sufficient to prevent a recurrence.

There were recorded 105 accidents caused by the use or handling of explosives. Through these, 23 people were killed and 121 injured. Most of the accidents were caused by children playing with detonators and other explosives. A summary of the accidents follows:

	Accidents	Killed	Injured
In mines and quarries	30	15	28
Elsewhere in industry	16	6	17
Playing with detonators	28	1	42
Playing with other explosives	27	1	24
Miscellaneous	4	.....	10
Total	105	23	121

MAGAZINES

Many of the large distributing magazines have been closed for the duration of the war, but a number of firms formerly operating unlicensed premises have taken out magazine licences for very small quantities of explosives. The building of war plants accounts for the large number of temporary magazine licences. At the end of the year, 344 permanent and 543 temporary magazine licences were in effect.

MISCELLANEOUS

Many individual seizures of explosives were made by the police from enemy aliens or persons of alien origin, and large amounts were voluntarily surrendered by others. These explosives and considerable quantities of explosives that had deteriorated and been condemned on inspection were destroyed by inspectors of the Division.

Approximately 550 importation and special importation permits to allow the entry of shipments of explosives were issued.

PUBLICATIONS

Following is a list of reports issued during the year.

Mines and Geology Branch

English Publications

Report No.

Separate of Annual Report for the Fiscal Year Ended March 31, 1940.
Separate of Annual Report for the Fiscal Year Ended March 31, 1941.

French Translation

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

Geological Survey

2458 Memoir 226. *Palæozoic Geology of the Brantford Area, Ontario*—by J. F. Caley.
2459 Memoir 227. *Jacquet River and Tetagouche River Map-areas, New Brunswick*—by F. J. Alcock.
2460 Memoir 228. *Nelson Map-area, East Half, British Columbia*—by H. M. A. Rice.
2461 Memoir 229. *Noranda District, Quebec*—by M. E. Wilson.
2462 Memoir 230. *Mining Industry of The Northwest Territories*—by C. S. Lord.
2463 Memoir 231. *Bousquet-Joannès Area, Quebec*—by H. C. Gunning.
2464 Memoir 232. *The Geology of East-Central Alberta*—by G. S. Hume and C. O. Hage.
2465 Memoir 233. *Clericy and La Pause Map-areas, Quebec*—by J. W. Ambrose.
2466 Memoir 234. *Mining Industry of Yukon, 1939 and 1940*—by H. S. Bostock.
40–18 *Houston Map-area, British Columbia*—by A. H. Lang.
41–1 *MacKay Lake Area, Northwest Territories*—by J. F. Henderson. (Map only.)
41–2 *Great Slave Lake to Great Bear Lake, Northwest Territories.* (Map only.)
41–3 *Ingray Lake Map-area, Northwest Territories*—by C. S. Lord.
41–4 *Brazeau, Alberta*—by B. R. MacKay. (Map only.)
41–5 *Manson Creek, British Columbia*—by A. H. Lang. (Map only.)
41–6 *Vassan-Dubuisson Map-area, Abitibi County, Quebec*—by G. W. H. Norman.
41–7 *Northeast Part, Beauchastel Township, Témiscamingue County, Quebec*—by E. D. Kindle.
41–8 *Morley, Alberta*—by G. S. Hume and H. H. Beach. (Map only.)
41–9 *Bighorn River, Alberta*—by B. R. MacKay. (Map only.)
41–10 *Steveville Oil and Gas Field, Alberta*—by J. S. Stewart.
41–11 *Redcliff, Alberta*—by J. S. Stewart. (Map only.)
41–12 *Beaver Mines, Alberta*—by C. O. Hage. (Map only.)
41–13 *Areas in the Vicinity of Steeprock Lake, Rainy River District, Ontario*—by T. L. Tanton.

French Translations

41–6 *Région de la carte de Vassan-Dubuisson, Comté d'Abitibi, Québec*—par G. W. H. Norman.
41–7 *La partie nord-est du Canton de Beauchastel, Comté de Témiscamingue, Québec*—par E. D. Kindle.

National Museum of Canada

None

Bureau of Mines

English Publications

806 *Combined Report of Investigations on Ore Dressing and Metallurgy, July to December, 1939.*
Petroleum Fuels in Canada, 1940—by J. M. Casey (folder).
Oil Schedule 3-A.
Handbook, *Prospectors Guide for Strategic Minerals.*
Revised edition, *Prospectors Guide for Strategic Minerals.*

French Translation

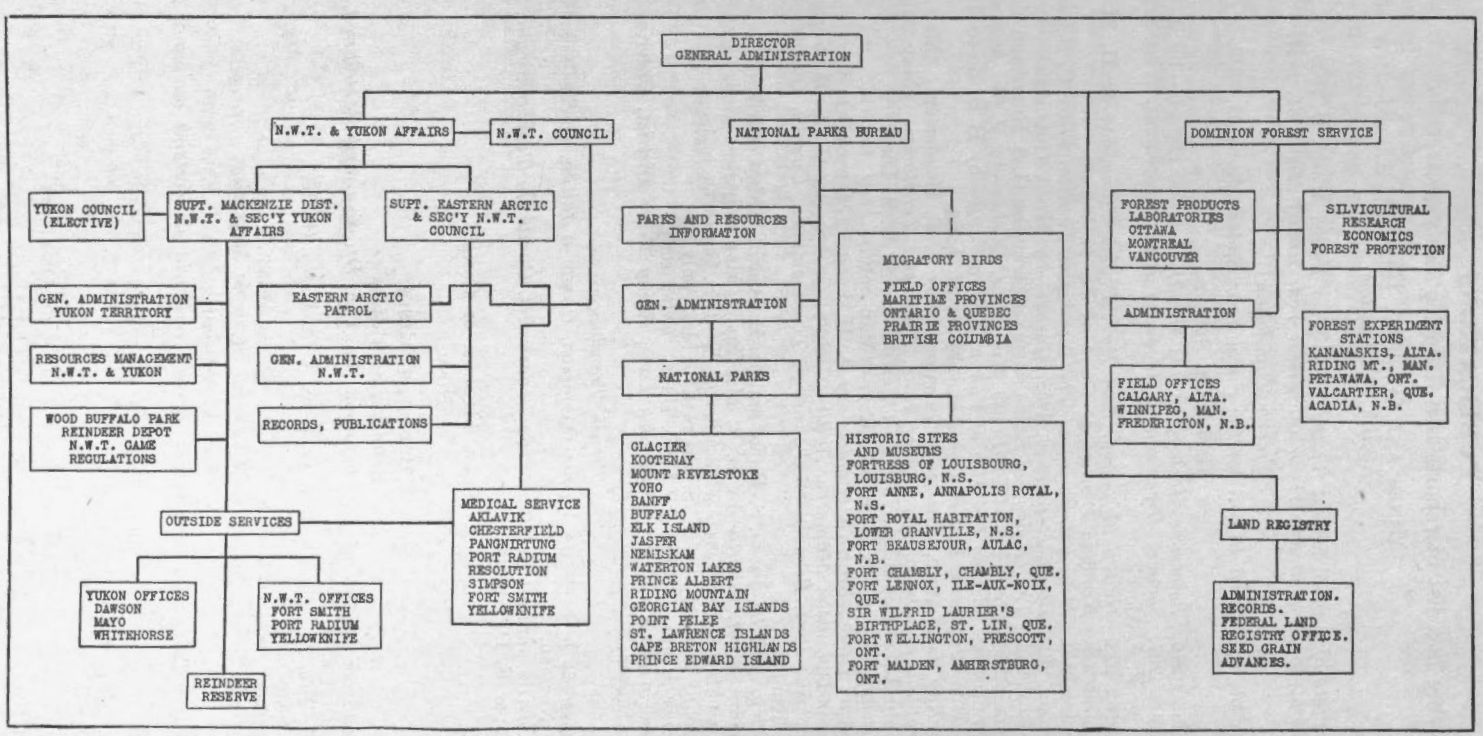
Guide à l'usage du prospecteur dans la recherche de certains minéraux de guerre au Canada.

Explosives Division

Explosives Act and Regulations.
Order in Council No. 472.

List of Mines and Mine Operators

List No. 1-2, Milling Plants in Canada Part I.
List No. 1-2, Milling Plants in Canada Part II.
List No. 4-1, Coal Mines in Canada.



Organization Chart, Lands, Parks and Forests Branch.

LANDS, PARKS AND FORESTS BRANCH

R. A. GIBSON, DIRECTOR

In this year substantially larger revenues were collected without any serious increases in rates. The cost of administration, care and maintenance of national properties was reduced by planning and economy. Important technical services were sustained. This was accomplished despite severe losses of staff because of enlistment of experienced and active young men for service in the Armed Forces and the loan of trained executives to War Departments.

The Northwest Territories and the Yukon Territory are becoming of increasing interest and certain defence schemes under way will provide readier means of transportation to country which has been little explored. The radium mines at Great Bear Lake, Northwest Territories, are being re-opened. Gold production in the Yellowknife field increased by $958,896 for the year but in the placers of the Yukon production fell off a little owing to unfavourable weather. While the gold mines are having special problems in wartime, operators in these same mining districts are exploring the possibility of increasing production of scheelite for tungsten.

Fur prices have been good and there has been less need for indigent relief among the natives and half-breeds. The administration is studying the question of nutrition and investigations under the supervision of nutrition specialists are being inaugurated.

The wild life resources of the Northwest Territories are reserved for the natives and half-breeds and for those whites who have been trapping there for years. Large game preserves are set aside for the benefit of the native population with a view to improving their economic and health conditions.

The attendance at the National Parks has been very good and it is noted particularly that a large number of those in the defence forces have spent their holidays in the parks. However, there are indications that there will be a sharp falling off in the number who are able to visit the parks during wartime because of the restrictions which the Government has found it necessary to impose on the sale of gasoline and tires.

Wood is becoming of rapidly increasing interest as a result of the war and the Dominion Forest Service has been able to supply a great deal of useful information about the forest resources, also concerning the means by which the available resources can be utilized most efficiently to meet present requirements.

The necessary work of the Branch has been sustained adequately with the reduced staff, most of whom are well above military age. Moreover, important work relating to the war has been undertaken in addition to usual responsibilities. This has involved considerable overtime duty and the foregoing of holiday leave on the part of many members of the staff.

Acknowledgment is made—first, to those who have assumed their duty in the Armed Forces—our best wishes to them wherever they may be; second, to those in other Government services who have given this Branch useful co-operation; third, to the members of the staff of the Branch who have not spared themselves in their endeavour to sustain the necessary work in an efficient manner.

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 fresh-water areas of the Northwest Territories is 1,309,682 square miles. The 1941 Census figures released to date give an unclassified population of 10,849.

The Northwest Territories Act provides for the appointment of a Commissioner of the Northwest Territories and vests in him those executive powers that were exercisable by the Lieutenant Governor of the Northwest Territories prior to the constitution of the Provinces of Saskatchewan and Alberta in 1905—so far as such powers are applicable. The Act also provides that the Commissioner shall administer the government of the Territories under instructions of the Governor in Council and the Minister of Mines and Resources and provides for the appointment of a Council of six members to aid the Commissioner in such administration. The Commissioner in Council has the same power to make ordinances for the government of the Territories as was formerly vested in the Legislative Assembly of the Northwest Territories in relation to such subjects as are designated by the Governor in Council. 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, S. T. Wood, H. L. Keenleyside
Secretary—D. L. McKeand

Work of Council

Fifteen regular and 5 special sessions of Council were held during the year. Assent was given to ordinances respecting the sale of unwrought metals, the operation and inspection of steam boilers, sanitary control, the prevention of disease, and the general welfare of camps and settlements. Amendments were made to the following ordinances: Territorial Liquor; Motor Vehicle; Businesses, Callings, Trades and Occupations; Local Administrative District, and Unwrought Metals Sales.

There was also discussion of matters of policy relating to Eskimo affairs; hunting and trapping; forest protection; transportation systems; reindeer; hospital and medical services; liquor regulations; By-laws of Yellowknife Administrative District; Eastern Arctic Patrol; applications for permit under Scientists and Explorers Ordinance; and private radio services.

Administration

The Lands, Parks and Forests Branch is responsible for the administration of the various acts, ordinances, and regulations pertaining to the Northwest Territories. To facilitate departmental administration there is a Superintendent for the Eastern Arctic and one for the Mackenzie District. A departmental agent is stationed at Fort Smith, N.W.T. and this officer is also Superintendent of Wood Buffalo National Park, Agent of Dominion Lands, Crown Timber Agent, Mining Recorder, Stipendiary Magistrate, and

Sheriff. The Mining Recorder, Agent of Dominion Lands, and Crown Timber Agent for the Yellowknife Mining District, which includes what was formerly the Great Bear Lake Mining District, is stationed at Yellowknife.

Medical Officers

The Northwest Territories has been divided into 8 medical districts over which medical doctors of the Department have jurisdiction. These officials have their headquarters at Fort Smith, Resolution, Simpson, Norman, Aklavik, Yellowknife, Chesterfield, and Pangnirtung.

All doctors have been appointed Coroners and Medical Health Officers under the Public Health Ordinance. These appointments give them full authority to enforce health and sanitary regulations. Most of the doctors make extensive patrols to outlying areas and all prescribe treatment through the medium of the radio telegraph service. Under emergency conditions medical advice is also sent over the wireless by the Director of Medical Services, Department of Pensions and National Health.

A Medical Officer also accompanies the annual Eastern Arctic Patrol. He acts as Ship's Doctor, examines and treats the natives en route, and submits reports of his findings.

Hospitals

During the year there were 11 hospitals in operation in the Territories, 10 conducted by the Roman Catholic or Anglican Missions at Fort Smith, Resolution, Hay River, Simpson, Norman, Aklavik (2), Rae, Chesterfield, and Pangnirtung, respectively, and one by mining interests at Yellowknife.

The Department pays the Mission hospitals $2.50 per diem for the treatment of indigent whites, Eskimos and half-breeds. Special arrangement was made for the care of aged and infirm indigents and chronic invalids on the basis of $200 per annum under what is known as the Industrial Home arrangement. During the year the sum of $27,134.31 was paid under these headings, representing approximately 9,479 days of care. No treatment or care of indigents is undertaken except on the recommendation of the resident Medical Officer.

Fourteen patients were treated in provincial institutions at a cost of $4,466.14.

The above figures do not include amounts paid by the Indian Affairs Branch for similar services to Indians only.

Schools

During the year the Anglican and Roman Catholic Missions operated residential and day schools in the principal settlements of the Territories. One hundred and twenty-eight indigent white, Eskimo, and half-breed children were maintained in the residential schools and 276 pupils attended the day schools. (In addition, 2 public schools were operated by the residents of the settlements at Fort Smith and Yellowknife, respectively.) Grants totalling $24,695.50 were paid toward the maintenance of schools, plus a small amount for school supplies.

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

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 sale of liquor in the Northwest Territories is governed by the Territorial Liquor Ordinance assented to April 27, 1939, and amendments. The Saskatchewan Liquor Board is Territorial Liquor Agent and stocks and operates a liquor store at Yellowknife under the direction of the Northwest Territories Administration. The net profits arising from the operation of the store and the proceeds of fines under the Territorial Liquor Ordinance are placed in a special account for Territorial purposes.

The net profits from the liquor store during the fiscal year ended March 31, 1942, amounted to $49,302.38, and fines under the Territorial Liquor Ordinance to $345, making a total of $49,647.38. Other revenue derived from liquor control amounted to $129, being $79 from the sale of permits issued at Ottawa, and $50 from fines for liquor offences under the Northwest Territories Act.

During the calendar year 1941, 57 permits were issued at Ottawa, authorizing the importation into the Northwest Territories (mainly to Eastern Arctic) of 75⅓ gallons of spirits, 5 gallons of wine, and 4 barrels of beer. Five hundred and twenty-six annual permits and 4,225 local daily permits for the purchase of liquor were issued at Yellowknife during the same period. The sales at the Yellowknife store in the calendar year were spirits 2,606 gallons, wine 1,063 gallons, and beer (including ale and stout) 20,557 gallons.

Aids to Navigation

Under the direction of the District Agent, existing aids were maintained at points on the Mackenzie River between the delta of Athabaska River and Great Bear Lake for the Department of Transport.

Lands and Timber

Surveyed Lands.—One lot was sold and patented in Arctic Red River Settlement, and one lot in Fort Smith Settlement was covered by a time sale. At Port Radium Settlement, 9 surface leases are in force, and at Yellowknife Settlement, which lies about 615 miles by air north of Edmonton, 172 such leases have been issued. These leases are for five-year periods.

On November 11, 1941, Salt Plains Indian Reserve No. 195, comprising 110·4 acres on both sides of the Salt River, was placed under the operation of the Indian Act by Order in Council.

Unsurveyed Lands.—Small parcels of unsurveyed land suitable for agricultural and fur-farming purposes, as well as tracts with water frontage suitable for transportation and shipping interests, are leased under the provisions of Chapter 113, R.S.C. 1927. The number of such leases in force is 27.

Eighteen permits to occupy land during the pleasure of the Department have been granted. There are 6 grazing leases in force, and, during the year, 5 hay permits were issued under which 101 tons of hay were cut.

During the year 18 assignments affecting lands were registered in the Department.

Timber.—The number of timber permits issued, exclusive of those granted in connection with timber berths, was 164, authorizing the cutting of 26,284 linear feet of timber, 200,000 feet board measure of saw timber, 2,035 fence posts, 615 roof poles, and 13,930 cords of fuel wood. Thirty-eight of these permits were issued free of dues to educational, religious, and charitable institutions, to settlers for domestic use, and to Government departments. Twelve timber permit berths were granted.

The revenue derived from lands, timber, grazing, and hay was $17,092.34, being an increase of $5,434.84 over the previous year.

Mining

The production of minerals in the Yellowknife area was increased during the year with the coming into production of the properties of Ptarmigan Mines, Limited, Thompson-Lundmark Gold Mines, Limited and Slave Lake Gold Mines, Limited. There were six gold mines in production with a combined output for the year valued at $3,166,723. Several important mineral discoveries were made in the district, including deposits of scheelite.

During the year 131 miner's licences, 230 renewal licences, and 362 quartz grants were issued. Representation work was performed on a number of mineral claims for which certificates of work were issued and at the end of March there were 3,165 mineral claims in good standing. Leases have been issued comprising an area of 11,383·68 acres. The total revenue obtained from fees payable under the Quartz Mining Regulations amounted to $11,700.03, including $5,015.83 collected as licence fees.

At the "Con" mine of the Consolidated Mining and Smelting Company of Canada, Limited, the main shaft is down to a depth of 1,091 feet and there are seven levels opened up with lateral work in excess of five miles. The output of the mill was increased during the year from 170 tons to 180 tons per 24 hours and 33,140 ounces of gold and 7,986 ounces of silver were produced. This brings the combined total value of the gold and silver produced by this mine since operations commenced in September, 1938, to $4,258,000. The company replaced their six-bed hospital by a new two-story well-equipped hospital with 16 beds. The Rycon Mines, Limited, property adjacent to the "Con" mine, was operated by the Consolidated Mining and Smelting Company and production for the year amounted to 4,661 ounces of gold and 1,055 ounces of silver.

A 2,500-foot drive connects the "Rycon" and "Con" mines and ore from the former is hauled along this drive to the No. 1 shaft of the "Con" and hoisted to a separate bin in the "Con" mill.

Production from the "Negus" mine for the year amounted to 18,496 ounces of gold and 3,381 ounces of silver. This property came into production in February, 1939, and the value of the output since that time exceeds $2,251,600. The mine has been opened to a depth of 734 feet with seven levels and more than two miles of workings. An 80-ton mill is in operation. The Thompson-Lundmark gold mine began production in September, 1941, and by the end of March gold to the value of $534,000 was produced from the 100-ton mill. The mine has been opened to a depth of 834 feet. In January, 1942, the Ptarmigan Mines, Limited, property came into production and by the end of March 3,956 ounces of gold and 836 ounces of silver had been produced. The underground workings have reached a depth of 924 feet and amount to more than 6,000 feet. The mill has a capacity of 100 tons but is run at a rate of 90 tons per 24 hours. The mine of Slave Lake Gold Mines, Limited, at Outpost Island, was re-opened in January, 1941, and production during the year amounted to 8,150 ounces of gold, 35,473 pounds of copper-gold concentrates, and 95,462 pounds of tungsten concentrates. The shaft has a depth of 445 feet with approximately 3,500 feet of lateral work. A small mining plant and mill have been transported to the Ruth property east of Yellowknife Bay. In March a small crew began the work of preparing the property of Eldorado Gold Mines Limited at Great Bear Lake for re-opening in 1942. Royalties collected for the calendar year ended December 31, 1941, amounted to $18,868.91.

The first hydro-electric power development in the Northwest Territories was completed in January, 1941, when the 4,200-horse-power Prosperous Lake power plant began generating electricity for transmission over the two 33,000-volt transmission lines, 22 and 26 miles in length, to the mines.

Coal.—Three coal mining leases are in force, comprising an area of 373 acres. Revenue from fees, rentals, and royalties in connection with coal mining rights during the year amounted to $303.38.

Petroleum and Natural Gas.—Petroleum and natural gas leases affecting lands in the Northwest Territories comprise a total area of 3,173·33 acres. Revenue from this source amounted to $480. Rentals satisfied from drilling credits totalled $1,253.33. Petroleum produced from the wells of the Northwest Company, Limited, below Norman on Mackenzie River, amounted to 23,776 barrels. The refinery unit erected on the company's property continued to operate and produced during the year aviation gasoline, aviation base gasoline, motor gasoline, and light and heavy diesel oil. One oil and gas permit is in force, comprising an area of 212·10 acres.

Dredging.—Two dredging leases are in force in the Northwest Territories, comprising in all 2 five-mile stretches of Grizzly and Bennett Creeks. Revenue from these leases for the year amounted to $60.

Northwest Game Act and Regulations

No person except a native-born Indian (or half-breed leading the life of an Indian) or an Eskimo (or half-breed leading the life of an Eskimo) shall engage in hunting or trapping any game protected under the Regulations without first securing a licence to do so.

The following are eligible for hunting and trapping licences:

(1) Residents of the Northwest Territories, as defined by these Regulations, who on May 3, 1938, held hunting and trapping licences and who continue to reside in the Northwest Territories.

(2) The children of those who have had their domicile in the Northwest Territories for the past four years, provided such children continue to reside in the Northwest Territories.

(3) Such other persons as the Commissioner of the Northwest Territories may decide are equally entitled to licences under these Regulations.

Only British subjects with four years' residence in the Northwest Territories are eligible for licences under Clause 2. A minor under the age of fourteen years shall not be eligible for a licence. A minor assisting his parents or guardians in connection with hunting or trapping operations will not require a licence.

Legislation.—Only one item of legislation affecting game was enacted during this fiscal year. P.C. 6838, August 29, 1941, permitted the shooting by Yellowknife residents of game birds on an area of approximately 210 square miles, around the mouth of the Yellowknife River, which lies within the Yellowknife Native Game Preserve.

Wood Buffalo Park.—The wardens maintained their regular patrols to check on the range and welfare of the buffalo. Reports indicate that the health of the herds is satisfactory. A few animals were drowned when they attempted to cross the ice of the Slave River before it had frozen sufficiently to bear their weight. A certain amount of predatory control was maintained.

The fur conservation project in the Dempsey Creek area is showing satisfactory results in increased muskrat population.

Fur and Game.—The catch of white fox, particularly by those trappers operating east and north of Reliance, was unusually satisfactory. The number of muskrats taken in the Mackenzie Delta was also large and this, combined with high price levels for these and other species resulted in better conditions for those who hunt for a living in the Territories. Other species of fur-bearers, with the exception of beaver and mink, were on the decline during the year.

Of the 8 fur farms licensed to operate in the Territories in the last fiscal year, 1 has relinquished its licence. A new mink farm located near Yellowknife has been licensed during the year. The Hudson's Bay Company did not

pelt any beaver on their Charlton Island Preserve during the year, in order to permit the breeding population to increase. A limited number of live animals were captured and transferred to other preserves to accelerate restocking of those areas. It was found impossible to secure a census of the beaver population on the Akimiski and Charlton Islands Preserves this year.

Comparative figures of the number of big game animals and birds taken during the licence years ending June 30, 1940 and 1941, and the average for the 5 years ended June 30, 1940, follow:

	Year ended June 30		5-year average 1936–40
	1941[2]	1940[1]	
Big Game—			
Caribou	18,159	22,241	14,134
Deer	77	63	36
Moose	1,211	1,072	796
Sheep	51	86	50
Game Birds—			
Ducks	11,393	12,995	7,735
Geese	838	1,009	730
Grouse	535	909	357
Partridge	2,608	4,078	1,402
Prairie chicken	1,836	1,600	1,029
Ptarmigan	10,682	7,154	4,832

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 1937–41
	1942	1941	
Hunting and Trapping—			
Resident	539	488	499
Non-resident bird licence	8	20	13
Trading and Trafficking—			
Resident	115	103	128
Non-resident	3	8	8

	Permits Year ended June 30		5-year average 1937–41
	1942[2]	1941[1]	
To establish trading posts	17	12	23
To take mammals	4	4	3
To hunt and trap in Wood Buffalo Park	341	333	346
To take migratory birds	16	12	16
To take scientific specimens	4	7	9
To take quota (15) of beaver	1,147	1,595	1,441

[1] These figures may differ slightly from those recorded in the Annual Report for 1940-41 because of additional returns received after that report was printed.
[2] Subject to revision as additional returns are received.

Revenue under Northwest Game Act for fiscal years ended March 31, 1941 and 1942 and average for five years 1937-41.

	Fiscal Year		5-year average 1937–41
	1942	1941	
	$ cts.	$ cts.	$ cts.
Hunting licences	1,060 01	1,153 84	1,554 40
Trading licences	1,524 29	1,899 90	2,115 80
Bird licences	155 00	100 00	52 00
Fur farm licences	26 00	23 07	19 21
Trading post permits	17 00	12 00	31 60
Sale of furs	700 60	454 32	467 62
Fur export tax	103,736 39	75,819 16	79,660 01
Fines and forfeitures	682 56	559 12	273 18
Sub-totals	107,901 85	80,021 41	
Revenue under Businesses, Callings, Trades and Occupations Ordinance	5,942 50	4,599 50	
Totals	113,844 35	84,620 91	

Infractions of Game Laws.—There were 38 prosecutions for infraction of the game laws. Convictions were secured in 35 of these cases.

Reindeer

There are three reindeer herds in the northern Mackenzie District, comprising about 8,000 head. A complete roundup of the main herd on the reserve near the Mackenzie Delta was prevented by adverse weather conditions but it was estimated that there were nearly 5,000 animals, including 1,100 fawns. The two herds under native management near the Anderson and Horton Rivers were reported to contain 2,093 and 1,083 head, respectively.

The slaughter of surplus stock in the main herd took place on Richards Island in September and near the main station on the winter range in December and March. The total number of deer from this herd slaughtered for meat purposes during the fiscal year was about 300. One hundred carcasses were allotted as a free issue to the missions operating hospitals and residential schools in the Mackenzie Delta area. The remaining meat was used by the reindeer staff, for relief of indigents, and by the medical officer. A limited quantity was sold. The revenue from meat sold (including a few hides) was $1,924.90.

The training of young natives as apprentice herders continued, and arrangements proceeded for the establishment of additional native herds.

Eastern Arctic Patrol

The annual Eastern Arctic Patrol sailed from Montreal on the R.M.S. *Nascopie* of the Hudson's Bay Company on July 8, and returned to Port Alfred, Quebec, on October 12. The work of the patrol was considerably heavier than in previous years as the Government radio stations on Resolution and Nottingham Islands were serviced for the first time.

D. L. McKeand, Officer in Charge of the Government party, reported that the Eskimos of the Eastern Arctic generally were in good health. Medical examinations were conducted at the various ports of call, and natives requiring hospital treatment were taken to Chesterfield or Pangnirtung. Dental treatment was extended to natives where necessary. Dr. Warren S. Smith of Montreal acted as Ship's Doctor from Montreal to Churchill where Dr. John Melling took over the duties for the remainder of the voyage.

Game was reported as plentiful, and indications were that the white fox, the principal fur-bearer, would reach the peak of its cycle of abundancy in the 1941-42 season.

Supplies and mail were delivered at the various posts, and the transfer of relief medical officers, radio operators, and Royal Canadian Mounted Police carried out. During the patrol, arrangements were made for the taking of the census of the Eastern Arctic and the distribution of identification discs to the Eskimos. Victory bonds were sold to the white people stationed at the northern posts, who oversubscribed the quota allotted them by 15 per cent.

Yellowknife Administrative District

The Local Trustee Board of 5 members held 19 Board Meetings and passed 6 by-laws, covering various subjects. The annual grant made by the Dominion Government to the Yellowknife Public School Board was increased to $1,500 as from November 3, 1941.

Public Improvements

Winter landing fields, seaplane bases, and roads were maintained. During the year the Northwest Territories Administration purchased a substantial quantity of additional fire-fighting equipment and with the assistance of the Royal Canadian Mounted Police, volunteer fire brigades were organized in most of the settlements.

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. The 1941 census figures released to date give an unclassified population of 4,687.

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

Territorial Council

Controller, Yukon Territory—G. A. Jeckell, Dawson

Seat of Government—Dawson, Y.T.

The following is the Yukon Council elected November 25, 1940; Dawson District, Andrew T. Taddie; Whitehorse District, Willard Leroy Phelps; Mayo District, Richard Gordon Lee.

Work of Council

The Yukon Council met on April 24, 1941. This was the first session of the twelfth wholly elective Council of the Territory. The Council was prorogued on April 26, 1941, after passing the annual supply bill but no new legislation.

ADMINISTRATION

The Lands, Parks and Forests Branch of the Department at Ottawa is responsible for the transaction of 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.

For local purposes the Territorial Government raised $176,658.03. The Dominion grant to the local government was $47,500. The total expenditure by the Territorial Government was $225,076.82.

LANDS AND TIMBER

One agricultural lease and 2 hay permits were granted; 5 renewal leases were issued, and 1 permit to occupy was cancelled. There are now in force 22 homestead entries, 9 agricultural leases, 24 waterfront leases, 2 miscellaneous leases, and 16 permits to occupy. The revenue derived from lands amounted to $5,846.57.

Eighty-nine permits were issued authorizing the cutting of 300,000 feet board measure of saw timber and 12,847 cords of wood. Three permits to cut wood for mining purposes were issued free of dues. Nine licence timber berths were cancelled, leaving 15 in force, for which licences were issued. Assignments of 3 berths were registered. Eight timber seizures were made. The total revenue collected from timber was $5,726.58.

MINING

Placer mining operations produced 87,442·60 ounces of gold, the value of which, at $35 per ounce, is $3,060,491. Compared with the previous year, this is a decrease of 10,695·91 ounces, due mainly to water shortage during the summer and early freeze-up in the autumn. Entries were granted for 156 placer and 44 quartz mining claims and 2,923 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, 5,310·81 acres.

Gold Royalty.—The total amount collected for royalty on gold obtained from placer deposits up to March 31, 1942, was $5,266,716.83, of which amount $32,791.28 was collected during the fiscal year.

Dredging Leases.—Three leases to dredge for minerals in the beds of rivers in the Territory are in force, comprising a total river stretch of about 14½ miles. The total rental from this source up to March 31, 1942, amounted to $210,641.17, of which $144.30 was collected during the year. These leases comprise portions of the bed of Klondike River. For the purpose of gold recovery 11 dredges engaged in mining in Yukon Territory, most of which are being operated by hydro-electric power.

Hydraulic Mining Locations.—The regulations for the disposal of hydraulic mining locations were withdrawn by Order in Council dated February 2, 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 stretch of approximately 16 linear miles. Rentals amounting to $211,141.50 have been collected on account of such locations, the amount received during the fiscal year being $2,398.

Coal Leases.—Two coal mining leases are in good standing comprising in all an area of 52 acres in the Moose River district.

Placer Mining Claims

The total number of placer claims in good standing at the close of the year was 2,616, 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 60,527 fine ounces of gold and 4,624 fine ounces of silver. The company employed an average of 390 men, the peak during the operating season being 702, and expended $1,163,000 for salaries, wages, and power. A further sum of $933,000 was expended for equipment, supplies, and freight.

The greater part of the 87,442·60 ounces of gold produced during the year was from the Dawson District, the Mayo District producing 2,550·75 ounces and the Whitehorse District, 932·37 ounces.

Lode Mining

Dawson District.—Entries were granted for 20 quartz claims staked during the year and development work was conducted on 101 claims previously staked.

Mayo District.—Twenty-three claims were located during the year and development work was undertaken on 340 others. Operations in this area were conducted mainly by Treadwell Yukon Corporation, Limited, on the Calumet claim, the mill being operated for a period of six months ended October 22, 1941. The ore mined amounted to 23,369 dry tons, 124 tons of which were sorted for shipment and the remainder milled. Concentrates recovered were 2,129 tons, the amount shipped being 1,476 tons. The concentrates shipped contained 763,055 ounces of silver and 1,552,162 pounds of lead and had a market value of $359,282.50.

Prospecting Leases

Prospecting leases representing a total stretch of 236 miles were issued during the year, comprising locations on several water courses, an increase of 38 miles as compared with the previous year.

Assay Office

The Assay Office was maintained as usual at Keno by the Territorial Government. A total of 1,098 samples of rock for assay were received from all parts of the Territory, and 1,752 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, 1,098; lead, 649; copper, 4; and tungsten, 1.

Roads and Bridges

Expenditures on the maintenance of the road system out of Territorial funds were $57,316.80, an increase of $7,266.23 over the previous year. Work was confined to maintenance of roads most used though a small amount was expended on new construction of roads to Haggart and Highet Creeks, respectively, in the Mayo District.

Development of Aircraft Landing Facilities

The sum of $3,183.60 was expended from Territorial funds on improvements to Dawson and Mayo landing fields and the Braeburn and Flat Creek emergency fields.

Agriculture

The summer 1941 was free from early and late frosts, but it was extremely dry and for this reason all crops were light. Owing to the lack of rain seeds for root crops did not germinate. In Dawson, production of tomatoes under glass was particularly good.

Public Welfare

The general health of the public of the Territory was good. Hospitals were operated at Dawson, Mayo, and Whitehorse, grants for their maintenance being provided by the Yukon Council. The numbers of hospital days of patients for the year were: Dawson, 13,776; Mayo, 1,817; Whitehorse, 2,878; the numbers of hospital days for indigents were: Dawson, 10,178; Mayo, 569; Whitehorse, 102.

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 273 and the number of teachers employed was 10.

Law and Order

Law and order have been 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. The Yukon Act having been amended to provide for the appointment of Stipendiary Magistrates to exercise the powers, authorities, and functions vested in the Judge of the Court, Mr. J. E. Gibben was appointed a Stipendiary Magistrate for the Yukon Territory on August 14, 1941.

LAND REGISTRY

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

Central Office of Record

In this inventory there are 5,890 parcels of land listed. The record shows the situation and area of each parcel, and the controlling Department.

Ordnance and Admiralty Lands

These lands were acquired by the Crown because of their strategic situation for military or naval purposes. When no longer required they were transferred to this Department to administer and they are, whenever possible, made revenue producing, usually by leasing. During the year investigations of 14 parcels were made in Quebec, 11 parcels in Ontario, and 1 each in Nova Scotia and Alberta. General investigations of lands in British Columbia were continued. A survey was made at Levis, Quebec. There were 18 leases and permits issued during the year and 17 sales effected. The revenue from Ordnance lands amounted to $34,701.66.

Public Lands

Three parcels of land were transferred to this Department for administration during the year and four properties were disposed of by sale. The revenue from sales and leases amounted to $8,288.19.

Soldier Settlement Charged Lands

The unpatented lands on the security of which advances have been made under the Soldier Settlement Act remain vested in the Crown in the right of the Dominion. There are 163 parcels comprising approximately 20,000 acres remaining of such lands, spread over the four western provinces. When entrants have completed their duties in accordance with the terms of the Dominion Lands Act and have paid their indebtedness to the Soldier Settlement of Canada, Letters Patent are issued in their favour. If the indebtedness is still unpaid when the duties are completed, Letters Patent are issued in favour of the Director of Soldier Settlement.

Timber and Grazing

Timber.—Eleven licence timber berths within the boundaries of National Parks cover a total area of 65·90 square miles; 2 of these berths are in the Province of Manitoba and 9 in British Columbia. During the year licences in duplicate were issued for these berths and the revenue amounted to $3,036.95.

On the Dominion Government Coal Block near Hosmer, B.C., one permit timber berth was relinquished, while the area of the only other remaining berth was increased by Order in Council from 272 acres to 1,032 acres. The revenue from these berths was $663.91.

Grazing.—During the year 10,695 acres were covered by 6 annual grazing permits on quarantine reserves along the southern boundary of Saskatchewan and Alberta. This was an increase of 1,095 acres as compared with last year. In the summer grazing season of 1941 there were 190 cattle, 172 horses, and 310 sheep grazing on these lands. The revenue, consisting of ground rent, amounted to $213.90.

Letters of inquiry from prospective settlers regarding the obtaining of lands in the western provinces, both for settlement and cattle grazing purposes, which are now under the jurisdiction of the provincial governments, continue to reach this Administration and are placed in their proper channels. Also considerable research work was undertaken having relation to both land settlement and timber berth transactions which took place many years ago.

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 1,338 cases. Their recommendations were ratified by Orders in Council and 1,109 discharges and releases of liens were issued, resulting in writing off the amount of $146,498.35. There were 2,055 inquiries received from the provinces for statements of indebtedness outstanding relative to the issue of land grants, and 141 certificates of indebtedness were issued to be attached to title. There were also 4,920 inquiries received from the different Debt Adjustment Boards in the western provinces. Gross collections for the fiscal year amounted to $16,990.58, which represents an increase of $1,051.85 over the previous year. The sum of $615.70 was refunded leaving a net revenue of $16,374.88.

As the staff engaged on this work has other responsibilities as well, it is impossible to give a definite figure for the cost of administration but the total amount including office expenses and field investigations is approximately $6,000.

The following summary shows the financial operations for the year ended March 31, 1942:

——	Principal	Interest	Total
DEBITS	$ cts.	$ cts.	$ cts.
Balance outstanding, March 31, 1941	2,827,034 61	3,407,863 08	6,234,897 69
Accrued interest, April 1, 1941 to March 31, 1942	.....	165,634 11	165,634 11
Total Debits	2,827,034 61	3,573,497 19	6,400,531 80
CREDITS			
Net Revenue— April 1, 1941 to March 31, 1942	10,126 38	6,248 50	16,374 88
Amount written off—as loss by Orders in Council (Sec. 1, Chap. 51, 17 George V.).	58,406 84	88,091 51	146,498 35
Amount collected and retained by Province of Saskatchewan as Commission Clause 18, Natural Resources Agreement with Province of Saskatchewan	1 00	17 65	18 65
Total Credits	68,534 22	94,357 66	162,891 88
Amount outstanding March 31, 1942	2,758,500 39	3,479,139 53	6,237,639 92

SUMMARY

PROVINCE OF MANITOBA

	Principal	Interest	Total
DEBITS	$ cts.	$ cts.	$ cts.
Amount outstanding, March 31, 1941	14,512 87	19,522 36	34,035 23
Accrued interest, April 1, 1941 to March 31, 1942	.....	768 97	768 97
Total Debits	14,512 87	20,291 33	34,804 20
CREDITS			
Net Revenue—April 1, 1941 to March 31, 1942	414 96	106 10	521 06
Amount written off as loss by Orders in Council.	182 34	542 53	724 87
Total Credits	597 30	648 63	1,245 93
Amount outstanding March 31, 1942	13,915 57	19,642 70	33,558 27

SUMMARY—*Concluded*

PROVINCE OF SASKATCHEWAN

——	Principal	Interest	Total
DEBITS	$ cts.	$ cts.	$ cts.
Amount outstanding March 31, 1941	1,771,272 67	2,081,660 16	3,852,932 83
Accrued interest April 1, 1941 to March 31, 1942	.....	103,412 36	103,412 36
Total Debits	1,771,272 67	2,185,072 52	3,956,345 19
CREDITS			
Net Revenue—April 1, 1941 to March 31, 1942	6,133 45	5,722 38	11,855 83
Amount written off as loss by Orders in Council	8,779 82	16,669 39	25,449 21
Amount collected and retained, as commission	1 00	17 65	18 65
Total Credits	14,914 27	22,409 42	37,323 69
Amount outstanding March 31, 1942	1,756,358 40	2,162,663 10	3,919,021 50

PROVINCE OF ALBERTA

——	Principal	Interest	Total
DEBITS	$ cts.	$ cts.	$ cts.
Amount outstanding, March 31, 1941	1,041,224 07	1,306,648 06	2,347,872 13
Accrued interest April 1, 1941 to March 31, 1942	.....	61,451 53	61,451 53
Total Debits	1,041,224 07	1,368,099 59	2,409,323 66
CREDITS			
Net Revenue—April 1, 1941 to March 31, 1942	3,577 97	420,02	3,997 99
Amount written off as loss by Orders in Council	49,444 68	70,879 59	120,324 27
Total Credits	53,022 65	71,299 61	124,322 26
Amount outstanding March 31, 1942	988,201 42	1,296,799 98	2,285,001 40

PROVINCE OF BRITISH COLUMBIA

Amount outstanding March 31, 1942	25 00	33 75	58 75

LETTERS PATENT

During the year 12 Letters Patent, covering a total of 1,553 acres, were issued for lands in the four western provinces and the Northwest Territories. There were 237 certified copies of Letters Patent issued for which $525 was received.

NATIONAL PARKS BUREAU

During the year the national parks continued to function as morale-building areas for a nation at war; as substantial contributors—through tourist travel—to Canada's supply of foreign exchange; and as places of sanctuary for native animal and bird life of the Dominion. War restrictions on travel did not come into effect in time to prevent attendance at the national parks reaching the highest figure on record.

Necessary maintenance and development work was carried on, having always in view the reduction of expenditures to the lowest point consistent with provident management. While the parks are not operated primarily as revenue-producers, it is worthy of note that revenue for the fiscal year exceeded all previous annual figures.

Measures were taken to protect park forests against damage by fire, insects, and depredation; wild life was protected; steps were taken to improve the fishing in park waters; historic sites were preserved and new sites marked; and a general publicity and educational campaign was carried on to acquaint Canadians with the resources they possess in their national parks, and to attract travel from other countries.

A new feature arising out of the war was the employment of Mennonites and other conscientious objectors on forest conservation and protection in the national parks.

Co-operation was extended to the Navy League of Canada in providing a site for a cadet training camp on Beausoleil Island, which is situated in Georgian Bay Islands National Park, Ontario.

Administration

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

In addition to the care and control of wild life within the parks, the Bureau administers the Migratory Birds Convention Act and the Game Export Act (assented to 14th June, 1941) which is a Dominion Statute in aid of Provincial game legislation.

HIGHLIGHTS OF THE YEAR

The official opening of Cape Breton Highlands National Park, Nova Scotia, on July 1, 1941, was an event of outstanding importance. The ceremonies were carried out at the park entrance near Ingonish Beach with John M. Campbell, M.L.A., as chairman. Brief but appropriate addresses were delivered by Hon. T. A. Crerar, Minister of Mines and Resources, and Hon. A. S. MacMillan, Premier of Nova Scotia, after which a plaid ribbon stretched across the park highway was cut by Hon. Mr. MacMillan.

Another event of interest was the official opening of the Port Royal Habitation, Port Royal National Historic Park, Lower Granville, Nova Scotia, on July 4, 1941. This group of buildings, constructed as nearly as possible as a replica of the original Habitation erected in 1605, commemorates the first permanent European settlement in Canada. The program included addresses by Hon. T. A. Crerar, Minister of Mines and Resources, who acted as chairman; Hon. E. Fabre-Surveyer of the Superior Court of Quebec; and Professor D. C.

Harvey, Archivist for the Province of Nova Scotia. Mr. Justice Fabre-Surveyer and Professor Harvey are members of the Historic Sites and Monuments Board of Canada. Greetings from and to the Order of 1606, Boston, Mass., and the Associates of Port Royal in the United States were read, and vocal selections in French and English were delivered by local artists. A record of the ceremonies was later broadcast by the Canadian Broadcasting Corporation.

On November 20, 1941, the house at Saint Lin, Quebec, in which Sir Wilfrid Laurier was born, was formally dedicated as a national historic site by Right Honourable W. L. Mackenzie King, Prime Minister of Canada. The dedication ceremonies were held on the hundredth anniversary of Sir Wilfrid's birth and were attended by many prominent in the political, social, and business life of the Dominion. Following a brief address the Prime Minister declared the house formally opened, and later officiated at the unveiling of a bronze tablet erected on the grounds to the memory of Sir Wilfrid.

Addresses were also delivered by Major-General Sir Eugene Fiset, Lieutenant Governor of Quebec; Honourable Adelard Godbout, Premier of Quebec; Honourable Bernard Bissonnette, Speaker of the Legislative Assembly of Quebec; Honourable Pierre F. Casgrain, Secretary of State for Canada; Honourable E. Fabre-Surveyer, member of the Historic Sites and Monuments Board of Canada; C. E. Ferland, M.P., and Philias Piche, Mayor of Saint Lin. Numerous messages and telegrams were also received from persons unable to attend the ceremonies, including His Excellency the Governor General, and Right Honourable Ernest Lapointe, Minister of Justice.

EVENTS OF INTEREST

The national parks continued to serve as centres for outdoor recreation, and numerous events sponsored by public and private organizations were successfully carried out. The annual five-day outing of the Trail Riders of the Canadian Rockies was held in Banff National Park and adjacent areas from July 25 to 29. The route from Banff to Mount Assiniboine traversed White Man and Assiniboine Passes, return being made via Sunshine Valley. The annual Sky Line Trail Hikers' meet was held in Kootenay National Park from August 1 to 4, and had the largest attendance in the history of the organization. The main camp was pitched at Prolific Meadow, near the headwaters of Numa Creek.

Approximately 120 mountaineers from Canada, United States, and other countries attended the annual camp of the Alpine Club of Canada in Glacier National Park, British Columbia, from July 20 to August 3. The site of the old Glacier House Hotel was used as a base of operations from which many spectacular climbs were carried out.

Winter sports events held in the parks were well attended. The annual Banff Winter Carnival held from February 12 to 15 attracted visitors from many points. A two-day skating carnival in Jasper was very successful, and the annual men's and women's curling bonspiels were well patronized. Many skiers enjoyed the opportunities for downhill skiing in Banff, Jasper, Yoho, and Mount Revelstoke National Parks.

A new attendance record was set at the Banff School of Fine Arts which held its ninth annual summer course in Banff from August 1 to 30. This project, sponsored by the Department of Extension, University of Alberta, offers special courses in art, music and drama. A party of 34 photographers, representing nearly every state in the United States, attended a school of photography in Jasper National Park from June 18 to 25.

During the latter part of June a large party of travel editors and feature news writers from the United States visited Banff, Jasper, and Waterton

Lakes National Parks. The excursion was sponsored by the Pacific Northwest Tourist Association, and the itinerary included a trip over the Banff-Jasper Highway.

His Excellency the Governor General and Her Royal Highness the Princess Alice visited Banff National Park in April. During the summer the Duke of Kent and party spent several days in Banff and Jasper National Parks.

The extensive use made of camping and picnic grounds in the parks was evidenced by the season's registrations. A total of 27,919 persons made use of the camping facilities at Tunnel Mountain camp-ground in Banff National Park, in addition to 8,850 persons utilizing the Central Park picnic grounds in the townsite of Banff. Public camp-grounds in Jasper, Kootenay, Yoho, Waterton Lakes, Elk Island, Prince Albert, Riding Mountain, and Point Pelee National Parks were also extensively used during the summer tourist season.

Bath-houses and swimming pools operated at the hot mineral springs in the parks were well patronized. The bathing establishment at the Upper Hot Springs, Banff, was used by 55,100 persons, and at the Cave and Basin Springs 48,845 persons were registered. At Radium Hot Springs in Kootenay Park a total of 29,471 persons used the swimming pool, and 14,952 persons made use of the swimming pool and baths at Miette Hot Springs in Jasper National Park.

The popularity of golf was reflected by increased use of many of the park courses. The annual tournament held at the Wasagaming Golf Club in Riding Mountain National Park attracted a record entry of 128. In Prince Albert National Park the annual "Lobstick" tournament was one of the popular events of the season. The number of players using the new Green Gables links in Prince Edward Island exceeded previous records, and increased use was made of the links in Cape Breton Highlands National Park. Annual tournaments were staged on the courses in Waterton Lakes and Elk Island National Parks, and on the courses operated in connection with Banff Springs Hotel and Jasper Park Lodge.

Annual regattas held in Prince Albert National Park and Riding Mountain National Park were well attended.

The park museum at Banff was visited by 33,482 people, an increase of 3,478 over the previous year. Exhibits on display in the museums at Riding Mountain and Prince Albert National Parks also attracted many visitors.

Information bureaus maintained in the larger parks during the summer tourist season found favour with the travelling public. A total of 22,371 inquiries were handled at Banff, 9,600 at Jasper, and 7,500 at Waterton Lakes National Parks.

Travel to the Parks

Visitors to the national parks and national historic parks numbered 1,000,563, an increase of approximately six per cent over the previous year. New attendance records were established at several parks, including Banff, Waterton Lakes, and Riding Mountain. Details as to the attendance at individual parks are given in the accompanying table.

A change in the method of compiling attendance figures for Banff, Jasper, Kootenay, and Yoho Parks—contiguous areas in the Rocky Mountains—was instituted during the year. Under the system adopted, inter-park traffic is no longer included in the totals. For purposes of comparison, the figures for 1940-41 in the following table have accordingly been revised.

Attendance at National Parks

National Parks	1941–42	1940–41*
Banff	278,286	240,900
Cape Breton Highlands	23,694	20,151
Elk Island	36,606	49,977
Georgian Bay Islands	4,061	3,157
Glacier	320	941
Jasper	24,761	32,017
Kootenay	33,812	31,233
Mount Revelstoke	5,783	9,025
Nemiskam	11	14
Point Pelee	104,442	107,833
Prince Albert	28,833	30,090
Prince Edward Island	40,470	35,665
Riding Mountain	176,161	163,230
St. Lawrence Islands	16,396	16,650
Waterton Lakes	135,774	114,578
Yoho	34,975	27,925
National Historic Parks		
Fort Anne	7,595	11,321
Fort Beausejour	6,379	12,488
Fort Chambly	5,835	9,345
Fortress of Louisbourg	6,690	10,879
Fort Malden	11,821	.....
Fort Wellington	8,771	8,852
Port Royal	9,087	6,662
Total	1,000,563	942,933

* Revised figures.

PUBLIC RELATIONS

Attention was directed to the value of national parks and the recreational opportunities afforded by them through the media of press, motion picture film, lantern slide, photo and mat services, educational exhibits, and public and radio addresses. Co-operation was extended to the Canadian Travel Bureau, transportation companies, advertising services, and other agencies engaged in the promotion of tourist travel. Special publicity was devoted to the official opening of Cape Breton Highlands National Park, and Port Royal National Historic Park, and to the dedication of the birthplace of Sir Wilfrid Laurier as a national historic site.

Press Services

The inauguration of a new mat service met with a ready response from the press of Canada. More than 475 daily and weekly newspapers and a number of periodicals were furnished on request with this type of material. Many mats were accompanied by specially prepared articles describing the attractions of the national parks. Articles and illustrations were also supplied to a number of publications in the United States where they received generous publicity. In addition, nearly 300 half-tones and line-cuts were lent to editors, publishers, and advertising services.

Press publicity was also obtained through the medium of the Canadian Resources Bulletin, a news-sheet issued weekly by the Department. This sheet

carries news items and facts of interest relating to the parks and associated services, and is mailed to a large number of newspapers in Canada and the United States, as well as to writers, news services, and travel agencies.

Parks Literature

Requests for literature descriptive of national parks and historic sites continued, and to meet the demand 393,535 copies of publications were printed. Included was "Canada's Mountain Playgrounds", the third in a series of illustrated booklets describing the national parks in groups according to geographical location. An illustrated folder descriptive of Riding Mountain National Park was lithographed in natural colour, and a new folder describing Canada's national park system, was also produced.

Material forwarded to tourist agencies, transportation companies, automobile associations, boards of trade, educational institutions, and individuals during the year included 539,922 copies of parks literature, 1,746 copies of the Canada Descriptive Atlas, and approximately 15,500 copies of maps and other literature published by private enterprise. A considerable part of this material was distributed in the national parks from tourist information bureaus operated during the season.

A list of publications printed for general distribution follows:—

Banff National Park (general information folder)	55,800
Canada's Mountain Playgrounds (descriptive booklet)	100,000
Fort Chambly National Historic Park (leaflet) (English edition)	10,000
Fort Chambly National Historic Park (leaflet) (French edition)	10,000
Jasper National Park (general information folder)	25,885
Kootenay-Yoho-Glacier-Mount Revelstoke National Parks (general information folder)	35,150
National Parks of Canada (illustrated folder)	100,000
Riding Mountain National Park (folder in natural colour)	30,000
Waterton Lakes National Park (general information folder)	25,700
Catalogue of Motion Picture Films	1,000
Total	393,535

A leaflet describing the Habitation at Port Royal National Historic Park, and new editions of general information folders on Banff, Cape Breton Highlands, Jasper, Prince Albert, and Riding Mountain National Parks were also prepared, but at the close of the fiscal year had not been delivered by the printer.

Films and Lantern Slides

The popularity of motion pictures as a medium of publicity and education was evidenced by a circulation of 3,038 films depicting the attractions of the national parks. These films were shown by travel organizations, educational institutions, conservation societies, field officers, and lecturers in different parts of Canada, the United States, Newfoundland, the West Indies, Great Britain, Brazil, Argentina, New Zealand, and Australia. The reported total attendance at showings of these films at home and abroad was 1,032,004.

A total of 183 new prints was added to the film library during the year. The library now contains 96 subjects in 16-mm. size and 86 prints in 35-mm. size. New kodachrome film was purchased, cut, and edited for five new subjects which have not yet been released. Assistance was furnished in re-editing the film "Radium Mining in Canada's Sub-Arctic" for another Branch of the Department, and in cutting and re-editing the film "Greenland". The services of the Motion Picture Division were also extended in the field of entertainment to various groups of the National War Services by provision of an operator for more than 200 film showings after office hours.

The demand for lantern slides as a publicity and educational medium continued, and 2,254 slides, accompanied by lecture notes, were lent to lecturers, educators, and others. Additions to the library stock included 156 new slides.

Illustration Material

An increased demand for photographs of the scenery, wild life, and recreational facilities of the parks by editors, publishers, advertising services, lithographers, and writers was met by the free distribution of 4,171 prints and enlargements. Additions to the photographic library included 50 new negatives and 2,176 prints and enlargements. Thirty-five translites were also obtained for display purposes.

Information Service

Requests for information from editors, publishers, and individuals were dealt with, and text matter, maps, and captions for illustrations in encyclopedias, almanacs, year books, highway maps, and tourist guides were checked and revised as required. Numerous inquiries for detailed travel information were also given individual attention.

Parks Exhibits

Excellent publicity was obtained from exhibits arranged at expositions and sportmen's and travel shows in Canada and the United States. The National Parks Bureau again participated in the Canadian National Exhibition at Toronto. A new exhibit with artistically designed background depicting the recreational advantages and wild life resources of the national parks was displayed in the Railway Building, and was awarded a gold medal by the Exhibition Commission. A travel information service was maintained in connection with the exhibit.

In co-operation with the Canadian Travel Bureau, mounted wild life specimens, photographs, translites and other national park exhibits were placed on view in resort, travel, and sportsmen's shows at New York, Boston, Philadelphia, Chicago, Detroit, Indianapolis, Milwaukee, Walla Walla, and Los Angeles. Material was also lent for showing at the Royal Agricultural Exhibit in Sydney, Australia.

New exhibition material obtained included mounted specimens of wild animals native to the national parks. Assistance was extended to the Canadian Exhibition Commission in the selection of specimens required to complete a representative collection of Canadian mammals.

General

The Superintendent of Publicity and Information attended travel conferences held at Edmonton, Alberta, and Spokane, Washington. Addresses, both to the public direct and over the radio, were delivered on various occasions. Publicity contacts were established at Minneapolis, St. Paul, Chicago, and Detroit which have had favourable results in acquainting Americans with Canada's war effort and in keeping before them the attractions which this country presents to vacationists.

Publicity for the official opening of Cape Breton Highlands National Park, including radio broadcasts and motion pictures, was personally supervised, as was also that for the opening of the Habitation in Port Royal National Historic Park and the dedication of Sir Wilfrid Laurier's birthplace at St. Lin, P.Q., as a national historic site.

DIRECT REVENUE

The gross revenue from the National Parks and from administration of the Migratory Birds Convention Act for the fiscal year 1941-42 amounted to $470,572 and $941.36 respectively, exceeding all previous records. Compared with figures of $393,012.55 and $534.12 respectively for the previous year, the combined net increase was $77,966.69.

MAINTENANCE AND IMPROVEMENTS

Maintenance of motor highways and secondary roads, trails, bridges, buildings, and recreational facilities in the parks was continued. In the park townsites streets and sidewalks were maintained and repaired; electric light, telephone, water, and sewage systems operated; collection and disposal of refuse attended to, and mosquito control measures carried out.

New Construction

A number of important projects were commenced or completed during the year. New steel highway bridges were constructed over Pipestone River in Banff Park, Sinclair Creek in Kootenay Park, Athabaska River in Jasper Park, and Pass Creek in Waterton Lakes Park. These bridges replaced original timber structures that had become unsafe for traffic and could not be economically repaired. A contract was let and construction commenced on a new fish hatchery in Jasper Park. The construction of a new breakwater in Prince Albert Park was commenced as a joint undertaking with the Department of Public Works. Approximately 20 miles of the Trans-Canada Highway in Banff Park, including a short spur road to Chateau Lake Louise, were hard-surfaced, and three miles of highway between the Town of Jasper and Jasper Park Lodge were given similar treatment.

Roads and Bridges

New highway construction was carried out in Cape Breton Highlands Park where 1·8 miles of the Cabot Trail at the eastern entrance were re-aligned and brought up to park standard. In addition, half a mile of new road leading from the main highway to the recreational area at Ingonish Beach was built.

Considerable work was also carried out in extending and grading secondary roads and trails in Kootenay, Yoho, Glacier, Elk Island, Banff, Jasper, Prince Albert, and Riding Mountain National Parks. These roads serve a dual purpose in opening up new scenic areas and permitting easy access of fire protection equipment.

Communication Systems

A total of 20 miles of forest telephone lines was constructed during the year. This mileage included 10 miles of new construction in Banff Park and 6 miles in Riding Mountain Park. Three miles of line were reconstructed in Jasper Park. In addition, 2 miles of telephone wire were replaced in Waterton Lakes Park.

Portable transmitter-receiving wireless sets were installed in Banff and Jasper Parks for forest protection and inter-park communication purposes. This type of communication has proven very satisfactory in Prince Albert, Riding Mountain, and Cape Breton Highlands Parks where similar types of sets were previously installed.

The following table shows the mileage of roads, trails, and telephone lines within the national parks as of March 31, 1942:—

National Park	Roads			Trails	Telephone Lines
	Motor	Secondary	Total		
Banff	171·7	11·6	183·3	755·0	266·5
Cape Breton Highlands	50·8	1·6	52·4	21·0	.....
Elk Island	16·0	.....	16·0	14·0	16·0
Glacier	.....	6·0	6·0	115·0	1·5
Jasper	155·0	9·0	164·0	554·0	411·0
Kootenay	61·1	8·0	69·1	152·7	60·0
Mount Revelstoke	18·0	.....	18·0	30·5	10·75
Point Pelee	6·5	2·8	9·3	.....	.....
Prince Albert	69·0	185·9	254·9	248·0	162·0
Prince Edward Island	7·1	2·5	9·6	.....	.....
Riding Mountain	60·3	46·9	107·2	119·0	146·0
Waterton Lakes	47·8	13·5	61·3	244·1	60·2
Yoho	46·0	6·0	52·0	199·0	51·0
Total	709·3	293·8	1,003·1	2,452·3	1,184·95

Buildings

Buildings completed in Banff Park included new warden cabins on the north side of Lake Minnewanka, on Stoney Creek, and at Fortune warden station in the Spray Lakes district. Fire lookout stations were constructed on Beehive and Tunnel Mountains, a comfort station was erected on the Administration Building grounds at Banff, and two staff residences were transferred from Lake Minnewanka to the Town of Banff and altered for isolation hospital purposes.

A new horse stable, fire shed, and patrol cabin were constructed in Glacier Park. In Kootenay Park two work camps were built along the Banff-Windermere Highway. Kitchen shelters, together with water and sanitary conveniences, were provided at three new public camp-grounds in Jasper Park. A modern barn was erected in Elk Island Park to replace a structure destroyed by fire. In addition a small pump-house and an ice-house were built.

Farm buildings near the golf links in Cape Breton Highlands Park were moved and remodelled for use as a golf club-house and a storage building. A grandstand was also built at the athletic field at Ingonish Beach.

General Improvements

Additional guard rails, embankment protection works, and rustic signs were provided in many parks for the protection of highway traffic. The intake of the water system at Radium Hot Springs in Kootenay Park was extended up Sinclair Creek to provide a higher pressure for both fire protection and domestic requirements. Small dams were built in the Sturgeon River in Prince Albert Park and at the outlet of Whirlpool Lake in Riding Mountain Park to assist in regulating the flow of water and maintain higher levels. The cultivation of a black walnut plantation in Point Pelee Park was continued. Special attention was devoted to the maintenance of cribs and dykes constructed for the protection of park highways in Cape Breton Highlands National Park from the action of the sea during storms.

Extension of Tourist Accommodations

Facilities for the accommodation of tourists in Banff Park were improved by the addition of approximately 40 new bungalow cabins, erected by private enterprise. In Jasper Park, a new bungalow camp situated near Sunwapta Falls on the Banff-Jasper Highway was opened. A new central building with lounge

was added to a bungalow camp in Riding Mountain Park, and additional tourist conveniences were provided by a bungalow camp operator in Waterton Lakes Park. Two four-room bungalows were added to the Keltic Lodge development at Ingonish in Cape Breton Highlands Park.

Lake Minnewanka Power Development

Under authority of the War Measures Act, permission was granted by Order in Council to the Calgary Power Company to increase the storage facilities of Lake Minnewanka and to construct a hydro-electric development at Anthracite, both areas being in Banff National Park. This action was subsequently ratified by concurrent legislation of the Dominion of Canada and the Province of Alberta (Natural Resources Transfer Agreement Act, 1941, Chapter 22). The additional power to be provided is intended to augment existing energy for war industry in the City of Calgary.

Work on the project was commenced early in 1941, and considerable progress has been made. As of March 31, 1942, construction of the main dam, power canal, tail race, and wood-stave pipeline was completed. The substructure of the power-house was also finished and turbine installed. Nearly completed were a steel penstock, surge tank, railway and highway culverts, control dam, and rip-rapping for the power canal. Necessary clearing and grubbing along the canal and around Lake Minnewanka was carried out, and a new trail built along the north shore of the lake.

The project also calls for the construction of a new scenic motor road from Anthracite to Lake Minnewanka which will provide a link in a loop drive from Banff, and the development of an area at the western end of Lake Minnewanka which will contain sites for a bungalow camp and a public camp-ground. While the progress made by the Calgary Power Company on these developments has not been up to expectations, it is hoped that all work will be completed by the end of the 1942 season.

Use of Alternative Service Workers

By authority of the National Resources Mobilization Act and the War Measures Act, the National War Service Regulations were amended in 1941 to permit Mennonites and other conscientious objectors exempted from military service to perform alternative service work for a period of four months in Banff, Jasper, Kootenay, Prince Albert, and Riding Mountain Parks. During the period June 1, 1941-March 31, 1942, a total of 1,277 men of the 21- to 25-year-old class as of July 1, 1940, reported for work. Of these 74 were subsequently discharged for medical or other reasons, and 16 enlisted for active service.

Projects on which workers were employed included construction or improvement of fire roads and trails, telephone lines, fences, dams, trail bridges, and culverts. Silviculture, the control of forest insect infestation, salvage of fire-killed timber, and the harvesting of hay for park use were also carried out.

New construction completed by alternative service workers included 1·7 miles of highway, 28·25 miles of secondary road, and 2,000 rods of fencing. In addition 50 miles of highway, 120 miles of secondary road, and 8·6 miles of pony trail were improved, and 10 miles of telephone line rebuilt. Tourist camp-ground facilities were improved in several parks, and a number of permanent buildings constructed. The construction of a large breakwater was partly completed in Prince Albert Park, and dams and flumes were built in other parks to improve the supply of water available for park purposes.

Practically all workers willingly carried out tasks assigned to them. At most camps the return of work in man-days equalled that usually performed by regular park labourers at prevailing rates, and much useful work of a forest con-

servation nature, which would not have been possible under regular appropriations, was accomplished.

Health and Medical Services

During the year, constant supervision was maintained over all matters relating to public health in the national parks. The Bureau continued to receive assistance and advice from the Department of Pensions and National Health in connection with health and sanitation. Through the co-operation of the latter Department, medical supplies and first aid kits were obtained for use in the parks, and medical services were also provided for alternative service workers' camps.

CONSERVATION

Forest Protection

Losses by fire during the 1941 season were considerably lower than in 1940. Increased precipitation in the mountain parks assisted in keeping the fire hazard at a low point. A total of 64 fires occurred, which burned an area of 60,487 acres inside the national parks, as compared with 104 fires and a burned area of 186,362 acres in 1940. The greater part of this loss was sustained in Prince Albert Park, where fires swept in from settled areas to the south and west, and burned some 59,000 acres within the park. Only one fire—in the marsh area of Point Pelee Park—occurred in the eastern parks.

An analysis of the cause of these fires showed that lightning was responsible for 26 per cent of the total. Approximately 20 per cent of the fires resulted from carelessness on the part of campers, and smokers accounted for 17 per cent.

Fire losses by parks in the fiscal year ended March 31, 1942, compared with losses for the preceding year, are given in the following table:—

Fire Losses in the National Parks

Park	Number of Fires	Area Burned Acres		Cost of Suppression	
		1940	1941	1940	1941
				$ cts.	$ cts.
Banff	26	8,885	68	20,138 58	610 56
Buffalo	.....	125	.....	24 50	.....
Elk Island	3	.....	650	.....	195 29
Glacier	1	Spot	1	.....	61 25
Jasper	11	"	33	23 65	271 51
Kootenay	.....	"	.....	53 07	.....
Mount Revelstoke	5	2,904	7	6,725 58	266 32
Point Pelee	1	.....	500	.....	20 00
Prince Albert	14	123,705	59,056	20,299 54	10,777 02
Riding Mountain	1	50,718	10	9,358 11	18 60
Waterton Lakes	.....	Spot	.....	91 35	.....
Yoho	2	25	162	780 98	532 16
Total	64	186,362	60,487	57,490 36	12,752 71

Improvement in Fire Prevention Equipment

An important requirement for forest protection in the mountain parks of Western Canada is an adequate lookout system to detect fires while they are small and controllable. With this fact in view a preliminary survey was carried out in 1940 to select potential sites for lookouts. This survey was continued in the summer of 1941, and sites for lookout stations were located in Banff, Jasper, Kootenay, Yoho, and Waterton Lakes Parks.

As a result of this survey, a 30-foot steel tower with pre-fabricated wooden cabin was erected on Tunnel Mountain, and a reinforced concrete cabin was constructed on Little Beehive Mountain, both in Banff Park. In Jasper Park material was bought for a 40-foot tower and pre-fabricated wooden cabin which will be erected in 1942.

Fire protection communication system in Banff and Jasper Parks were improved by installation of twelve trans-receiver radio sets to supplement the existing forest telephone systems. Fire trails, sufficiently wide to allow passage of light trucks, were improved in Banff, Jasper, Prince Albert, and Riding Mountain Parks.

Fire Hazard Studies

Fire hazard studies commenced in 1939 to determine the relationship between weather and fire-hazard conditions were continued. A new fire-weather station was established in the Ottertail region of Yoho Park, which complements stations already established in Banff, Jasper, Waterton Lakes, Prince Albert, and Riding Mountain Parks.

Insect Control

Measures for the control of the lodgepole pine bark-beetle (*Dentroctonus monticola*) were continued in Banff and Kootenay Parks under the supervision of an entomologist of the Department of Agriculture. Following a survey of an affected area in Banff Park, all infested trees were marked, cut and burnt. In this work, care was taken to burn around stumps so that no bark remained to harbour grubs.

In Kootenay Park, where infestation first occurred several years ago, dead trees were removed from affected areas on each side of the Banff-Windermere Highway. Using alternative service workers, the necessary logging and sawmill operations were carried out, and as a result, approximately 500,000 board feet of lumber were salvaged for official use.

Further examinations of areas showing evidence of beetle infestation are planned, and, where necessary, control measures will be inaugurated promptly to prevent the disease from reaching epidemic stage.

During the year the Bureau continued to co-operate with the Division of Entomology, Department of Agriculture, in collecting specimens for the annual "Forest Insect Survey".

Wild Life Management

The national parks continued to function as living museums, where examples of Canada's native wild life flourish in an ideal environment. When the parks were first established, most of them contained depleted wild animal populations, but under sanctuary conditions, one species after another is attaining the maximum population that the area can support. Even in Banff, oldest of Canada's park units, this development is still going on. In this area the white-tailed deer, common a century ago, has reappeared and is increasing each year.

In general, natural controls limit the animal population of the parks to reasonable figures. An exception, however, was recorded during the year in Banff Park, where it was found necessary to slaughter a number of elk in Bow River Valley. This action was taken only after a biological investigation, carried out during the critical months of winter.

Inspections were also carried out by biologists of the Department's staff in Cape Breton Highlands, Point Pelee, St. Lawrence Islands, Riding Mountain,

Nemiskam, and Jasper Parks. These investigations, supported by the scientific observations recorded, assist in the interpretation of detailed reports forwarded by the park wardens. In this manner, the value of the parks as natural sanctuaries may be gauged. Among other results of investigations carried out, detailed lists of birds are now available for ten national parks.

In May, 1941, a party of scientists from the Royal Ontario Museum, Toronto, visited Point Pelee Park. The party was engaged in the study of reverse migration of birds.

As opportunities arise, species which once occurred in parks but have been exterminated, are reintroduced. In accordance with this policy, a number of beaver were placed in Elk Island Park during the year. This area, situated in the Beaver Hills region of Alberta, at one time was a home for large numbers of this industrious little animal. Beaver placed in Cape Breton Highlands Park in 1938 have thriven, and the species is now well established in the Ingonish region.

Wild Animal Parks

An important feature of wild life conservation in Canada has been the establishment of special parks for the protection of certain animals that were in danger of extinction. Of these, Elk Island Park in Alberta contains a large herd of buffalo in addition to a number of moose, wapiti, and deer. In order to keep the herd within the grazing capacity of the park, it was found necessary this year to slaughter 500 buffalo under contract, which included the disposal of all products. The herd at present numbers 1,128 head.

Large numbers of buffalo are also successfully established in Wood Buffalo Park, an area of 17,300 square miles situated partly in Alberta and partly in the Northwest Territories. The most recent authoritative estimate places the number of buffalo in this park at 12,000.

Nemiskam National Park, situated in southern Alberta, contains a herd of prong-horned antelope. During the year, range and water conditions were satisfactory, and the antelope are reported to be in good health.

The remaining wild animal reserve, Buffalo National Park, has been turned over to the Department of National Defence for military purposes.

Following is a census of wild animals in fenced enclosures within national parks, as of March 31, 1942:—

Animals in Fenced Areas

Species	Banff Park Paddock	Elk Island Park	Nemiskam Park	Prince Albert Park Paddock	Riding Mountain Park Paddock	Total
Antelope			125			125
Buffalo	12	1,128		6	60	1,206
Elk	3	545			120	668
Moose		144			1	145
Mule deer		24			1	25
White-tailed deer					8	8
Rocky Mountain sheep	6					6
Total	21	1,841	125	6	190	2,183

Wild Life Protection

During the year, conservation activities necessary to prevent the depletion of Canada's wild life resources were carried on by the Bureau. The study of

fluctuations in the population of the snowshoe rabbit or varying hare in Canada was continued, and the data obtained from the return of questionnaires were forwarded to the Bureau of Animal Population, Oxford University, Oxford, England. A summary of the inquiry, compiled by Dennis and Helen Chitty of Oxford University, was published in *The Canadian Field-Naturalist.*

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

The Fifty-ninth Stated Meeting of the American Ornithologists' Union, Denver, Colorado, September 1-5.

Annual Convention of the Nova Scotia Fish and Game Protective Association, Halifax, February 19.

First Annual Meeting of the Canadian Conservation Association, London, Ontario, May 9-10.

Considerable effort was devoted to the preparation of agenda for the Dominion-Provincial Wild Life Conference, and to the arranging of details of the first Canadian meeting of the North American Wild Life Conference, both of which are to be held early in the fiscal year 1942-43.

The Advisory Board on Wild Life Protection held one meeting for consideration of eider-down collection in Baffin Island, and other wild-life problems of the Northwest Territories.

The following additions to the personnel of the board were made during the year:—

Inspector D. J. Martin, O.C. "G" Division, Royal Canadian Mounted Police, vice Assistant Commissioner Caulkin;

Dr. J. M. Swaine, Director of Science Service, Department of Agriculture, Ottawa, vice Dr. Arthur Gibson, Dominion Entomologist, now retired from the Service;

James Smart, Controller, National Parks Bureau, Department of Mines and Resources, Ottawa, vice the late F. H. H. Williamson;

D. Roy Cameron, Dominion Forester, Department of Mines and Resources, Ottawa;

Eric Druce, Bureau of Northwest Territories and Yukon Affairs, Department of Mines and Resources, Ottawa;

Dr. Austin L. Rand, Assistant Zoologist, National Museum of Canada, Department of Mines and Resources, Ottawa.

Fishing and Fish Culture

Efforts to improve sport fishing in the national parks were continued, and cultural activities were carried on in Banff, Jasper, Waterton Lakes, Kootenay, Yoho, Mount Revelstoke, Prince Albert, Riding Mountain, and Cape Breton Highlands National Parks. In Jasper Park, the construction of a new fish hatchery was started. When completed, this hatchery will have a capacity of 750,000 fish eggs, and will assist in maintaining the fish population of the park at a high figure. Research work was carried out by the officer in charge of the hatchery in a number of lakes near the Town of Jasper. As a result, much information essential to the proper management of fisheries in the park was obtained.

The experiment of stocking Lake Waskesiu in Prince Albert with small-mouthed black bass was continued, and a shipment of 300 adult fish from Ontario was received. Evidences of natural spawning of black bass were found in Hanging Heart Lakes and are attributed to adult fish introduced in 1936. As an experiment, rainbow trout fry were wintered in rearing ponds in

Riding Mountain Park in an endeavour to raise them from fry to fingerling stage before release in Clear Lake. In the latter stage the fish have a better chance of survival.

The park hatcheries in Banff and Waterton Lakes Parks again were utilized by the Province of Alberta in hatching trout eggs for restocking provincial waters, and more than 1,200,000 fry were distributed. In addition, numerous park waters were stocked with game fish. Included was Lake Louise in Banff Park, in which 400 rainbow and 200 speckled trout, all over legal size, were placed. During the year, a total of 1,470,327 fry, fingerlings, and adult fish were distributed in park waters as follows:

Park	Rainbow Trout	Cutthroat Trout	Speckled Trout	Salmon	Small-mouthed Black Bass	Total
Banff	504,900	124,000	99,300	.....	.....	728,200
Cape Breton Highlands	.....	.....	.....	150,000	.....	150,000
Jasper	265,995	.....	10,680	.....	.....	276,675
Kootenay	20,000	.....	10,000	.....	.....	30,000
Mount Revelstoke	6,000	.....	.....	.....	.....	6,000
Prince Albert	.....	.....	.....	.....	300 (adult) 100,000 (fry)	300 100,000
Waterton Lakes	109,062	20,090	.....	.....	.....	129,152
Yoho	50,000	.....	.....	.....	.....	50,000
Total	955,957	144,090	119,980	150,000	100,300	1,470,327

Improved fishing was reported in Waterton Lakes Park, where the season's catch exceeded that of previous years. Many fine catches of great lake trout, great northern pike, and pickerel were reported at Prince Albert Park. Trout and salmon fishing were enjoyed by many anglers in Cape Breton Highlands Park, and numerous deep-sea species were caught in adjacent waters.

The creel census inaugurated in 1940 was continued, and returns showed a marked improvement over the previous year. More than 2,000 cards were received from anglers reporting their catches in Banff, Jasper, Waterton Lakes, Kootenay, Yoho, and Prince Albert Parks. This figure, however, represents only a small percentage of possible returns. The object of the census is to record the improvement or deterioration of fishing from year to year, and as its purpose becomes better known, it is hoped that fishermen will be more anxious to co-operate.

NATIONAL HISTORIC PARKS AND SITES

The functions of the National Parks Bureau include the restoration, preservation, marking, and administration of National Historic Parks and Sites, and the commemoration of the public services of outstanding personages connected with the civil and military history of the Dominion. In this phase of its work the Bureau is advised by the Historic Sites and Monuments Board of Canada, an honorary body composed of recognized historians representing the various parts of the Dominion.

Because of war conditions the annual meeting of the Board did not take place. Several tablets, however, were erected, bringing to 332 the number of sites which have been marked on the recommendation of the Board.

The personnel of the Board is as follows: Chairman, 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.; Hon. E. Fabre-Surveyer, Montreal, P.Q.; J. A. Gregory, M.P., North Battleford, Sask.; Rev. Antoine d'Eschambault, St. Boniface, Man.; Major G. Lanctot, Dominion Archivist, Ottawa, Ont.; W. D. Cromarty, National Parks Bureau, Ottawa, Ont.

National Historic Parks

Fort Anne National Historic Park, Annapolis Royal, N.S.—During the year the sally-port or postern at Fort Anne National Historic Park was repaired and made waterproof. The entrance to No. 1 powder magazine was repointed and the stone stairs restored. Extensive repairs were made to No. 2 powder magazine, including the repointing of the interior and exterior walls. Additional articles of interest were obtained for the museum. Visitors to the park included many members of the active forces, as well as teachers and pupils from Canadian schools.

Port Royal National Historic Park, Lower Granville, N.S.—The newly constructed buildings forming the "Habitation" at Port Royal National Historic Park, Lower Granville, were officially opened on July 4, in the presence of a large gathering. A series of coloured drawings by Dr. C. W. Jefferys depicting life at the original "Habitation" was framed and hung in the Community Room. The furniture for this room was donated by The Order of 1606, Boston, Mass. Suitable pieces for some of the other rooms are being acquired. The number of visitors to the park showed an increase of nearly 50 per cent over the previous year.

Fortress of Louisbourg National Historic Park, Louisburg, N.S.—The exterior woodwork of the museum was painted and the roads and paths within the park were improved. Additional book-cases were obtained to house the library of the late Senator McLennan, which has been donated to the museum. In addition to the 6,690 persons who signed the museum register, it is estimated that another 1,000 people visited the park.

Fort Beausejour National Historic Park, Aulac, N.B.—During the year, parcels of land in the vicinity of Fort Beausejour National Historic Park which contain the site of the old British blockhouse and the remains of Monckton's lines of entrenchments were donated to the Crown. Steps are being taken to have these areas included in the park. The exterior woodwork of the museum was painted, and the parking area was regravelled.

Fort Chambly National Historic Park, Chambly, P.Q.—Various sections of the stone walls of the fort were repointed and repairs were carried out on the northeast bastion and the retaining wall facing Richelieu River. The iron fence in front of the fort and picnic grounds was painted, and the surrounding grounds improved. A leaflet describing the exhibits in the museum was compiled and printed.

Fort Wellington National Historic Park, Prescott, Ont.—Improvements carried out at Fort Wellington National Historic Park included the reshingling of the building originally used as the officers' quarters. The palisades, flag pole, and fence surrounding the park were repaired, the cannon on the grounds were painted, and the parking area improved. Additional articles of interest were obtained for the museum.

Fort Malden National Historic Park, Amherstburg, Ont.—The exterior woodwork of the museum was painted, and the stonework around the basement windows and front entrance steps repointed. Two oak racks were built to display a collection of guns of historic interest. Among the numerous articles presented to the museum were a hand-pump fire engine formerly used at Fort Malden, and a hand-press on which the first issue of the "Amherstburg Echo" was printed. A full-time caretaker was appointed during the year.

During the nine-month period in which a record of attendance was kept, a total of 11,821 persons entered the museum, in addition to approximately 1,000 who visited the grounds.

Fort Prince of Wales National Historic Park, Churchill, Man.—General supervision was continued at Fort Prince of Wales National Historic Park during the year, and signs affixed to the walls were repaired.

National Historic Sites

During the year the following national historic sites were marked:

Birthplace of Sir Wilfrid Laurier, Saint Lin, P.Q.—At the ceremonies attending the dedication of the birthplace of Sir Wilfrid Laurier as a national historic site, a boulder and tablet on the grounds were unveiled by the Right Honourable W. L. Mackenzie King on November 20, 1941, the one-hundredth anniversary of Sir Wilfrid's birth.

Sir Samuel Leonard Tilley, Gagetown, N.B.—A bronze tablet was affixed to the Post Office Building in memory of Sir Samuel Leonard Tilley, K.C.M.G., a Father of Confederation, Premier and Lieutenant-Governor of New Brunswick, and Minister of Finance of Canada. He was born at Gagetown in 1818, and died in Saint John in 1896.

Treaty with the Indians, 1778, Saint John, N.B.—A bronze tablet was affixed to a monument on Fort Howe Hill, in honour of Abbe Joseph Mathurin Bourg and the Honourable Michael Francklin, Superintendent of Indian Affairs, for their services in keeping the Indians of Nova Scotia loyal to the Crown during the American Revolution by a Treaty of Peace made at Fort Howe on September 24, 1778.

Charles Fisher, Fredericton, N.B.—A bronze tablet was affixed to the Legislative Assembly Building in memory of Charles Fisher, a Father of Confederation; lawyer, statesman, and judge; Premier of New Brunswick, 1851-61. He was born in Fredericton on September 16, 1808, and died there on December 8, 1880.

William Henry Steeves, Saint John, N.B.—A bronze tablet was placed in the main hallway of the New Brunswick Museum in memory of William Henry Steeves, a Father of Confederation; industrialist and legislator; Senator, 1867-73. He was born at Hillsborough on May 20, 1814, and died in Saint John on December 9, 1873.

John Mercer Johnson, Chatham, N.B.—A bronze tablet was attached to the Post Office Building in memory of John Mercer Johnson, a Father of Confederation and Speaker of the New Brunswick Assembly. He was born in Liverpool, England, on October 10, 1818, and died at Chatham, New Brunswick, on November 8, 1868.

John Hamilton Gray, Saint John, N.B.—A bronze tablet was placed on one of the inner walls of the New Brunswick Museum in memory of John Hamilton Gray, a Father of Confederation; lawyer, legislator, and historian; Speaker of the New Brunswick Assembly, 1866-67, and Judge of the Supreme Court of British Columbia. He was born at St. George's, Bermuda, in 1814, and died in Victoria, B.C., on June 5, 1889.

Peter Mitchell, Newcastle, N.B.—A bronze tablet was affixed to the Post Office Building in memory of Peter Mitchell, a Father of Confederation; lawyer, legislator, and journalist; Premier of New Brunswick, 1865-67, and Senator, 1867-72. He was born at Newcastle on January 4, 1824, and died in Montreal on October 25, 1899.

Sir James McPherson Le Moine, Quebec, P.Q.—A bronze tablet was placed on an inner wall of Morrin College in memory of Sir James McPherson Le Moine, Kt., D.C.L., F.R.S.C., author, historian, and ornithologist. He was born in Quebec City on January 24, 1825, and died at Spencer Grange, Sillery, on February 5, 1912. The tablet was unveiled under the auspices of the Quebec Literary and Historical Society on January 14, 1942.

Joseph Bouchette, Quebec, P.Q.—A bronze tablet was affixed to the house at 44 St. Louis Street in memory of Joseph Bouchette, Surveyor-General of

Lower Canada and author of standard topographical works. Bouchette was born in Quebec City on March 14, 1774, and at one time resided in the house to which the tablet is affixed. He died in Montreal on April 9, 1841. The tablet was unveiled under the auspices of the Quebec Land Surveyors' Association on April 16, 1941.

Chemin Royal (King's Highway), Quebec, P.Q.—A bronze tablet was affixed to St. John's Gate, to commemorate the historic events connected with this highway. On August 5, 1734, Lanouillier de Boiscler, Chief Roadmaster of New France, started from Quebec by coach for Montreal, thus officially inaugurating the King's Highway in Canada.

MIGRATORY BIRDS CONVENTION ACT

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

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

The length of the waterfowl hunting season, bag limits, and other restrictions affecting the hunting of migratory birds in Canada continued without any major change as compared with the previous year. A closed season for Ross's goose, a species which has been greatly depleted in numbers, was established in Alberta and in the Northwest Territories, the only political divisions of Canada in which this species occurs. A similar closed season is provided throughout the range of the species in the United States. The closed season upon Atlantic brant was continued.

A change affecting sale of birds for food in less accessible areas in Canada was made.

In British Columbia the waterfowl situation was generally satisfactory in spite of local deterioration of nesting habitat. The mallard is widely distributed in this province, and is adaptable to a variety of conditions. This species continued to be abundant and the annual kill probably exceeded that of many other species.

In some respects a substantial improvement took place in the waterfowl situation in the Prairie Provinces, although many lakes and pot-holes in the south became dry or seriously subsided as the season progressed. The water-table continued to fall over substantial areas in the three provinces. In spite of these conditions waterfowl held their own in numbers and it may be possible that additional benefits will accrue to waterfowl owing to the war, since fewer hunters may be in the field and sporting ammunition is increasingly scarce. The water development work under the Prairie Farm Rehabilitation Act has been of distinct benefit in providing breeding habitat for waterfowl.

The duck population in Ontario and Quebec is very satisfactory for the most part. The birds that are principally hunted by sportsmen here are standing up to hunting pressure very well. The principal game duck is the black duck and they were present in satisfactory numbers.

In the Maritime Provinces the waterfowl situation might be described as highly satisfactory with the exception of brant, the continued scarcity of the latter being caused, no doubt, by the long-standing failure of the eel-grass crop.

Two new bird sanctuaries were established during the year. These are located at Port Joli in the Province of Nova Scotia, and at South River in the Province of Quebec. A total of 61 bird sanctuaries have now been reserved in Canada under the Migratory Birds Convention Act, giving a total area of 1,290 square miles.

There are 789 Honorary Game Officers appointed throughout the Dominion, of which 15 are Officers of the Forestry Service, 108 are Officers of the Department of Fisheries, and 107 are Canadian Pacific Railway Police. In addition, the Game and Fishery Officers of the Provinces of New Brunswick, Quebec, Ontario, Manitoba, and British Columbia, are ex-officio Game Officers operating under the Migratory Birds Convention Act as are also the members of the New Brunswick Provincial Police.

The responsibility for the police work in connection with the enforcement of the provisions of the Migratory Birds Convention Act and Regulations thereunder throughout Canada was transferred from the Department of the Interior to the Royal Canadian Mounted Police by Order in Council, P.C. 2283 of the 14th of October, 1932.

Field administration of the Act was continued under the supervision of four District Migratory Bird Officers. In addition to their regular work they carried out extensive waterfowl investigations, studies of food of waterfowl, snowy owl migration, the numerical status of woodcock, and the destruction of sea birds by oil, as well as faunal investigations as opportunity offered in certain national parks and other areas of special interest.

Special protective measures were continued for the few remaining trumpeter swans in British Columbia. They wintered very well and in one area were given the benefit of small supplies of grain for food.

Lectures were given on the value of native wild birds and their conservation, and successful co-operation was continued with the provincial governments, game conservation societies, and other organizations interested in bird conservation.

The eiderdown industry in Saguenay County, Quebec, on the north shore of the Gulf of St. Lawrence, continued to provide income for local residents through rational utilization of the down produced by a large nesting population of eider ducks. An experiment in the development of an eiderdown industry in southern Baffin Island was terminated after production of a quantity of down.

In order that proper steps may be taken towards the conservation of native wild birds as a valuable natural resource, it is necessary to have available for study certain precise data about them. The only practical and satisfactory way in which much of the important information required may be obtained is by means of scientific bird-banding.

Bird-banding in North America is being conducted in full co-operation between Canada's National Parks Bureau and the Fish and Wildlife Service of the United States Department of the Interior.

Practically all of the birds banded in Canada are marked by some 200 voluntary co-operators who serve without pay and furnish their own equipment and transportation. These conservation-minded citizens operate under Dominion permits, use only official bands which are furnished them free of charge, and provide the National Parks Bureau with full details of their banding activities. Permits to band birds are issued only to persons who possess definite ornithological ability.

Up to December 31, 1941, a total of 400,912 birds of many species have been banded in Canada and details as to band numbers, species, dates, etc. have been duly recorded. Of these, well over 20,000 individual birds have been recaptured and released, killed by hunters, or found dead. It is through study of such data that problems relating to wild life may be investigated. During

the calendar year 1941, a total of 22,299 new records of birds banded in Canada were added to the official records, while the recovery of 1,624 banded individuals was recorded.

Success of bird-banding research depends largely on the voluntary co-operation of the public in reporting details relating to any banded birds that are recovered, and the National Parks Bureau is deeply grateful to all those who have thus far helped in this way. Reports about banded birds may be mailed postage free in Canada if sent in envelopes marked "O.H.M.S." and addressed to the Controller, National Parks Bureau, Ottawa.

Permits and licences issued during the year under the provisions of the Migratory Birds Convention Act totalled 1,268. Printed material distributed comprised 5,446 copies of the Consolidation of the Migratory Birds Convention Act and Regulations; 19,456 copies of Abstracts of the Regulations; 37,881 posters, and 17,613 pamphlets; 1,981 motion picture films and slides were lent to voluntary co-operators, and 66 lectures were given by officers of the Bureau.

DOMINION FOREST SERVICE

During 1941 products of Canadian forests and forest industries continued to play an important part in the Allied war effort. Although full details are not available it seems probable that production of both the pulp and paper and the lumber industries exceeded all previous records. Exports of lumber to the United Kingdom were considerably smaller than those of the previous year, but those to the United States were greatly increased. Demand for Canadian newsprint was steady but the vastly expanded needs for other kinds of paper and for wood-pulps strained production facilities to the utmost.

War conditions have made it necessary to restrict silvicultural research on forest experiment stations. Provision of useful forestry work for internees at internment camps on three of the forest experiment stations continued. In addition, an alternative service workers' camp was established at the Kananaskis station. These men evinced an inclination to give of their best and the work output was very creditable.

Forest protection organizations throughout the country worked under handicaps during the summer season of 1941, due to losses of key men to the armed forces and restrictions in labour supply available. The fire hazard was extremely high in some parts of the country, particularly in the Provinces of Ontario and Quebec, and losses were heavy. Under war conditions dependence must rest on the exercise of an unusual degree of care by the general public if forest fire losses are to be kept within bounds. Wood is probably being put to a higher variety of uses in the war effort than any other single commodity, and it is the duty of every citizen to live up to his responsibilities in preventing forest fires.

The work of the Forest Products Laboratories during the year has to a large extent pertained to problems arising in the uses of wood for war industries and for special war equipment. The use of timber for aerodromes, military camps, aircraft, naval construction, munitions containers, and related uses, has demanded a great deal of attention and close liaison with the Timber Control and with various purchasing, inspection, and military services.

FOREST ECONOMICS

In external trade the "wood, wood products and paper" group of commodities were again responsible for a large favourable trade balance, principally with the United States. Thus wood and its derivatives made possible the purchase of large quantities of war supplies which had to be obtained outside Canada.

Domestic consumption of lumber for war purposes was about equal to that of 1940, namely, 400,000,000 board feet. Lumber was delivered at 150 different sites in Canada for use in the construction of more than 4,000 wooden buildings at naval, military, and air establishments and at munitions factories. About 25,000,000 board feet of Sitka spruce were produced for use in aircraft construction at home and abroad, while the output of birch veneer logs increased from 66,500 tons in 1940 to 90,000 tons in 1941. Increased quantities of lumber were used in boxes and crates. Many materials, and particularly metals, are in relatively short supply for civil purposes because of the demands of war industries, and wood has been found to be a satisfactory substitute in many instances.

Operations of the timber trade continued to be directed by the Timber Controller of the Department of Munitions and Supply. Because a system of price controls had gradually been developed from the commencement of timber control operations in 1940, the lumber industry was little disturbed by the institution of the general price control policy established by the Government in December, 1941.

It is estimated that the total area of Canada's forests, commercial and non-commercial, is 1,220,405 square miles. Of this area about 430,000 square miles are considered to be accessible and productive. About 35 per cent of the land area of Canada, and 58 per cent of the area of the nine provinces, is occupied by forests of one kind or another.

Forest Areas

	Square Miles
Productive forests:	
Merchantable	381,515
Young growth	389,050
Non-productive forests	449,840
Total forested land	1,220,405

The total volume of merchantable timber is estimated to be 313,140 million cubic feet, of which 211,656 million cubic feet are considered to be accessible to commercial operations.

The average annual depletion of merchantable timber during the ten-year period 1931-40 was estimated to be 3,642 million cubic feet. Nearly all of this depletion took place on the accessible and productive portion of the forest, and its replacement requires an average annual growth rate of 14 cubic feet per acre on that area.

Average Annual Depletion, 1931-40

	Millions of Cubic Feet
Volume used	2,548
Merchantable timber burned	394
Destroyed by insects, tree diseases, etc.	700
Total	3,642

Approximately 70 per cent of the total depletion was used and 30 per cent wasted.

In a group of important forest countries in northern Europe the annual increment actually secured averages 28 cubic feet per acre; but this is only achieved under conditions of forest management which are more intensive than those to be found in Canada to-day. It is believed that, under present conditions, any increase in the average rate of depletion may cause considerable reductions in our forest capital. In any case it has to be recognized

that our stocks of very large timber of great age are being rapidly used up and that the industries depending on logs from such trees will have to adapt themselves to the use of smaller material in the not distant future.

The relative importance of the principal branches of forest industry in 1940 is indicated in the following table:—

FOREST INDUSTRIES

Summary of Principal Statistics, 1940

——	Capital Invested	Employment	Salaries and Wages	Net Value of Products
	$	Man-years[1]	$	$
Woods operations	209,000,000	100,000	100,000,000	150,000,000
Lumber industry	91,602,899	39,501	34,021,825	61,700,043
Pulp and paper industry	642,979,942	34,719	56,073,812	158,230,575
Wood-using industries	106,761,146	35,547	34,570,093	54,892,521
Paper-using industries[2]	58,350,125	13,235	15,904,147	33,637,248
Totals	1,108,694,112	223,002	240,569,877	458,460,387

[1] 300 man-days.
[2] Not including printing trades.

The net value of products of the forest industries in 1940 exceeded that of the previous year by 21·6 per cent

AERIAL FOREST SURVEYS

Measurements of timber quantities and other related data required for general use in aerial photographic estimating were obtained at the Petawawa Forest Experiment Station. The great value of aerial photographs for purposes of site classification was demonstrated on the same area.

At the request of the Indian Affairs Branch an estimate of spruce saw-timber on the Red Earth Indian Reserve in Saskatchewan was made. A stand table was compiled by measuring tree heights and crown widths in winter photographs taken ten years previously, and the volumetric estimates were adjusted to allow for growth during the past decade. The area was logged during the winter and the quantity cut was found to be very close to the amount estimated by study of the photographs. No ground work whatever was done in connection with this project. Maps and timber estimates were also prepared on two areas of Indian lands in Nova Scotia totalling 25 square miles.

Forest inventory maps were prepared covering 26 square miles in Saskatchewan and 2,605 square miles in Nova Scotia. In the latter province special uses for these maps have been found in connection with an economic survey which is being conducted by provincial authorities, and in coastal defence areas.

Estimates have been prepared from aerial photographs for test purposes covering two small areas, one located in the Baie Comeau region and the other on the upper basin of the Lièvre River, in the Province of Quebec. Cutting is proceeding in these areas and the returns will be available for comparison with the estimates when the work is completed.

Winter photographs of the Riding Mountain National Park in Manitoba were used for making estimates of the board foot volume contained in scattered large trees. Previous estimates had been expressed only in cords.

A number of Canadian foresters showed considerable interest in the aerial photographic work of the Dominion Forest Service, and a representative of the United States Forest Service made a special visit to Ottawa and entered into lengthy consultations on various aspects of the work.

A research note on the "Determination of Tree Heights from Shadows in Air Photographs" was published. This note is the first of a series which will deal in detail with the technique that is being developed. It is believed that these publications may be of value in connection with the use of aerial photographs for war purposes.

SILVICULTURAL RESEARCH

Botany and Ecology

For the fifth consecutive year phenological records—data on the time of leafing, flowering, fruiting, and growth of trees and shrubs—were taken at the several stations. The accumulated data will shortly be published.

The Sub-committee on Tree-Breeding of the Associate Committee on Forestry, National Research Council—made up of representatives of the Council, of the Entomological and Pathological Divisions of the Department of Agriculture, and of the Dominion Forest Service—has been actively pursuing its efforts to develop means of stimulating the production rate of desirable species, and to produce, by selection, cross-breeding, and hybridization, new types of commercially desirable trees; resistance to insect and fungus damage plays an important part in these investigations. Nurseries, arboretums, and testing gardens have been established at the Petawawa Forest Experiment Station, and at the National Research Council Laboratory. Promising results along the lines of vegetative propagation have been secured.

Other ecological studies conducted at the several research stations covered nursery studies, seed dissemination, seed-bed conditions, and crown development.

A check survey was made of the areas in the Lièvre basin which were surveyed in 1930. The growth rate of spruce and balsam fir was found to be 43·1 cubic feet per year for the period 1930-40. Results are given in Silvicultural Research Note No. 71.

Outlines for methods of studying conditions on cut-over lands were prepared and published.

Silviculture

The war has tremendously stimulated the demand for wood and wood products of all descriptions, and, as a result, logging operations were in progress on several experiment stations. Advantage was taken of this situation to conduct studies of thinnings, improvement cuttings, and harvest cuttings.

Thinnings were carried out in fifteen-year-old plantations as part of a study to determine the minimum number of trees per acre required for maximum growth results. Pruning experiments to develop knot-free material were carried out. Inferior species such as poplar, balsam fir, and jack pine were removed from a number of mixedwood stands, to provide better growing conditions for such species as red pine, white pine, and spruce. An extensive operation to fill a war order for red pine poles released considerable young white and red pine.

An examination was carried out on cut-over white spruce lands in the Carrot River area, Saskatchewan, with a view to comparison with residual stands left after selective logging.

Mensuration

Some preliminary yield tables for even-aged red pine stands at Petawawa have been developed. Tables showing yields of stands of various densities, for a ten-year period, are being prepared.

Advances in scaling methods have been made. A log scale on calipers showing values in International board foot units has been devised, to simplify timber cruising. Poles are now being scaled in cubic feet instead of in linear feet.

A volume table for spruce pit-props and a table showing shrinkage of cordwood when resawn were prepared.

Administration

Cover-type maps have been completed for the Petawawa Station, as part of the working plan survey.

Estimates of permissible annual cut of coniferous species for each working circle of the Riding Mountain National Park were prepared.

The amount of timber cut was kept within the working plan budget allowance at all stations.

FOREST PROTECTION

Taking Canada as a whole, the fire season of 1941 was the third worst on record since reliable statistics began in 1918. The total damage and cost was $13,242,179 as against an average for the decade 1931-40 of $4,498,463. In 1923 the total damage and cost was over forty-six million dollars and in 1919 it exceeded twenty-seven million dollars. The total area burned over in 1941 was 4,252,651 acres as against an annual average of 2,212,786 acres for the period 1931-40. The total number of fires reported was 5,951, while the 10-year average was 6,087. Of these fires, 23 per cent were attributed to lightning, an average of 16 per cent being attributed to this cause during the period 1931-40.

The season was not equally severe in all parts of Canada. The losses were below average for the previous decade in all provinces except Quebec, Ontario, and Alberta, where the areas burned over and the losses were much above normal. A statistical analysis will be found in Tables 1-4.

A short description of the fire season of 1941, by provinces, follows:

British Columbia.—An unusually high spring hazard developed following a winter of light snowfall and warm dry spring weather. However, from May onward the precipitation was much above the average and no prolonged dangerous periods occurred.

Alberta.—The spring fire season was abnormally long and severe following a winter of scanty snowfall. Bad conditions prevailed in the northern part of the province well on into the summer, and this resulted in one of the worst seasons on record.

Saskatchewan.—Serious hazard periods developed in the latter part of May and in midsummer but fortunately these were terminated by wet periods before extensive damage occurred.

Manitoba.—The fire hazard was generally below normal. Dry conditions prevailed in the northwestern part of the province and some bad fires occurred in the spring. Later in spite of rain these fires continued to spread in the ground and necessitated a great deal of trenching.

Ontario.—The season was marked by periods of extremely high hazard in certain sections. In one such period during May, three fires accounted for 60 per cent of the total area burned during the season and 70 per cent of the total damage. Two of these fires were of incendiary origin and accounted for half the total area burned over during the season.

Quebec.—Quebec experienced the worst fire season since 1923. The spring fire season was long and severe and extended well into the summer with little or no rain for long periods. Five people lost their lives as a result of forest fires.

New Brunswick.—The spring season was cool with frequent rains and well distributed rainfall throughout the rest of the season served to keep the hazard below normal, so that the year was one of the most favourable on record.

Nova Scotia.—The fire season began with dry windy weather in April. Later the weather became cold and damp, resulting in a favourable season with fewer fires than usual.

Dominion-Protected Lands.—These comprise National Parks, Indian Reserves, and Dominion Forest Experiment Stations. The fire season was generally favourable in national parks with the exception of Prince Albert Park where bad fires swept in from settled areas outside the park and accounted for 93 per cent of the total area burned in all the parks. Indian lands, as a whole, experienced a rather bad season, the area burned being about five times greater than normal and the cost plus damage about double the normal for the 10-year period 1931-40. Fire losses on Dominion Forest Experiment Stations were very small.

Forest Fire Research

For the benefit of the east slope national parks, research work in forest fire hazard was continued at the Kananaskis Forest Experiment Station in Alberta. The aim is to develop forest fire hazard tables for the east slope forest types, by means of which an accurate daily index of fire-hazard in each region may be computed from simple weather records. This system of fire-hazard measurement, developed some years ago at the Petawawa Forest Experiment Station and adapted for use in eastern regions by additional research in Quebec and New Brunswick, is now used throughout these two provinces in the daily administration of forest fire protection. Seventeen weather stations for the use of this system are now in operation in western national parks.

A study to determine the effect of altitude above sea-level upon the performance of portable gasoline forest fire pumping units was undertaken. The efficiency of these units was found to decrease rapidly with altitude. The study provided, for the first time, a knowledge of the performance to be expected from a unit at any given altitude, and made possible rating tests on a large number of units in the mountain parks to determine their existing state of efficiency. Where necessary, means for the improvement of such units were suggested.

Surveys were conducted in Rocky Mountains parks to determine the most economical and effective locations for lookout points for forest fire detection. Large numbers of mountain peaks were scaled and the area visible from each peak was mapped. A careful analysis of the data thus noted will make possible the selection of sites upon which lookouts may be constructed to provide the most economical and efficient coverage for fire detection in these mountain areas.

TABLE 1

*Forest Fire Losses in Canada, 1941, Compared with 10-Year Average 1931-40**

Item		Annual Averages 1931-40	Year 1941
Fires under 10 acres, number		.....	3,833
Fires 10 acres and over, number		.....	2,118
Total number of fires		6,087	5,951
Area burned—			
Merchantable timber	acres	476,782	1,498,128
Young growth	"	644,081	858,892
Cut-over lands	"	396,543	972,018
Non-forested lands	"	695,380	923,613
Total area burned	"	2,212,786	4,252,651
Merchantable timber burned—			
Saw timber	M. ft. b.m.	768,398	703,828
Small material	cords	1,929,394	7,620,649
Estimated values destroyed—			
Merchantable timber	$	2,244,912	8,814,098
Young growth	$	886,690	1,549,200
Cut-over lands	$	246,603	961,606
Other property burned	$	302,028	610,216
Total damage	$	3,680,233	11,935,120
Actual cost of fire-fighting	$	818,230	1,307,059
Total damage and costs	$	4,498,463	13,242,179

* Minor differences in certain figures (as found in previous reports) are the result of more accurate revisions.

TABLE 2

Forest Fires in Canada by Causes, 1941, Compared with 10-Year Average 1931-40

Cause	Average 1931-40		Year 1941	
	No.	%	No.	%
Camp fires	1,198	20	797	13
Smokers	956	16	827	14
Settlers	1,018	17	1,068	18
Railways	272	4	265	4
Lightning	953	16	1,343	23
Industrial operations	138	2	140	2
Incendiary	500	8	176	3
Public works	63	1	45	1
Miscellaneous known	402	6	514	9
Unknown	586	10	776	13
Totals	6,086	100	5,951	100

TABLE 3

Statistics of Forest Fires by Regions, 1941

(Averages given are those for 10-year period 1931–40)

Item	British Columbia		Alberta		Saskatchewan		Manitoba		Ontario	
	Average	1941	Average	1941	Average	1941	Average	1941	Average	1941
Fires—										
Total number	1,676	1,561	358	445	248	274	404	259	1,563	1,265
Caused by lightning ... %	29	56	4	2	5	11	9	11	21	22
Areas burned—										
Merchantable timber ... acres	66,877	47,771	123,186	372,637	47,479	47,360	32,635	28,881	146,948	325,892
Young growth ... "	79,572	25,467	154,866	488,802	235,324	100,613	33,090	14,283	76,752	78,031
Cut-over lands ... "	213,538	34,659	17,496	34,510	15,250	11,304	4,506	1,285	21,471	150,422
Non-forested lands ... "	66,540	46,991	164,592	459,475	158,115	95,386	144,191	82,096	94,034	112,202
Total ... "	426,527	154,888	460,140	1,355,424	456,168	254,663	214,422	126,545	339,205	666,547
Damage ... $	872,982	548,305	835,299	2,085,489	195,731	159,173	124,823	113,688	1,004,194	2,669,868
Cost of fire fighting ... $	190,669	174,271	74,686	161,862	62,121	50,233	32,879	16,251	268,561	230,698
Total damage and costs ... $	1,063,651	722,576	909,985	2,247,351	257,852	209,406	157,702	129,939	1,272,755	2,900,566

Item	Quebec		New Brunswick		Nova Scotia		Dominion Lands					
							National Parks		Indian Lands		For. Expt. Stations	
	Average	1941	Average	1941	Average	1941	Average	1941	Average	1941	Average	1941
Fires—												
Total number	1,087	1,710	260	147	356	153	79	64	51	68	7	5
Caused by lightning ... %	5	6	12	16	0	0	9	27	14	9	13	0
Areas burned—												
Merchantable timber ... acres	41,506	665,625	7,522	327	1,477	300	6,245	177	2,503	9,157	449	1
Young growth ... "	36,522	111,071	6,634	33	4,612	1,002	14,283	27,386	1,641	12,182	873	22
Cut-over lands ... "	110,564	718,014	10,241	324	1,269	1,232	1,504	19,555	673	633	36	80
Non-forested lands ... "	20,482	95,524	24,457	492	9,181	2,895	11,179	16,069	1,981	12,483	719	0
Total ... "	209,074	1,590,234	48,854	1,176	16,539	5,429	33,211	63,187	6,798	34,455	2,077	103
Damage ... $	524,037	6,257,200	80,623	10,398	21,774	4,118	61,824	64,184	11,359	22,550	6,165	147
Cost of fire fighting ... $	118,844	647,445	26,874	1,143	22,376	4,708	16,461	12,130	4,296	8,284	594	34
Total damage and costs ... $	642,881	6,904,645	107,497	11,541	44,150	8,826	78,285	76,314	15,655	30,834	6,759	181

TABLE 4

Fire Season, 1941—Comparative Statement by Provinces

Province	Increase or Decrease in Relation to Average for Period 1931-40			Proceedings Under Provincial Fire Laws	
	Number of Fires	Area Burned, Acres	Cost Plus Damage	Prosecutions	Convictions
	%	%	%		
British Columbia	− 7	− 64	− 32	25	24
Alberta	+ 24	+193	+147		
Saskatchewan	+ 10	− 44	− 19	20	19
Manitoba	− 36	− 41	− 18	1	1
Ontario	− 19	+ 97	+128	22	19
Quebec	+ 57	+660	+974	95	74
New Brunswick	− 44	− 98	− 89	23	20
Nova Scotia	− 57	− 67	− 80	6	6

FOREST PRODUCTS LABORATORIES

During the past year the work of the Forest Products Laboratories in Ottawa and Vancouver has been directed chiefly towards problems connected with the prosecution of war. Similarly, the Pulp and Paper Research Institute of Canada at Montreal has been giving valuable advice and assistance in connection with the war effort. Long-term investigations undertaken in days of peace have necessarily been curtailed so that the staffs could devote their attention to questions of immediate urgency. From the brief review of some of the year's activities which follows it may be noted that some projects were undertaken in direct co-operation with the fighting services while others were concerned chiefly with increasing the efficiency of war industries.

The following is a brief reference to some of the more important activities which have received attention.

MAIN LABORATORIES—OTTAWA

DIVISION OF TIMBER MECHANICS

Developments in the application of plywood to building construction and to the manufacture of aircraft have been reflected in the great increase in demand for basic strength data of plywood made from species such as yellow birch and Douglas fir. In addition, there has been a demand for data on the suitability of other species for the manufacture of plywood. This has been particularly true of some of the hardwood species which might provide suitable substitutes for birch in the manufacture of aircraft veneer. The possibilities of certain softwoods have also received attention. The investigation of these plywoods has been carried out in co-operation with other Government services and the data obtained have been made available to the services concerned.

Restrictions in the availability of certain glues for aircraft construction, and the necessity of speeding up production of glued assemblies, have caused heavy demands on the Laboratories. Tests to determine the suitability of numerous types of urea and phenol formaldehyde synthetic resins in the manufacture of special equipment have been called for by the Royal Canadian Air Force and other services of the Department of National Defence.

Supplies of Sitka spruce for aircraft are in great demand at the present time, and an extensive series of tests was carried out on white and red spruce to find out to what extent they could be used instead of Sitka spruce.

Among the many aircraft components for which high-grade Sitka spruce has been used are laminated wing spars. Experiments were continued to determine whether sufficiently strong components could be built using lower grade material in the less highly stressed parts of these spars, without any sacrifice in the strength or quality of the completed component.

The packaging of munitions, both for transportation overseas and within Canada, consumes large quantities of lumber. The design of such packages upon scientific lines has been instrumental in making considerable economies in lumber consumption, in better protection of the contents, and in reduction in package volume, thereby conserving shipping space. The design of such containers has been carried out for the Departments of National Defence, Munitions and Supply, and for munitions manufacturers. The containers designed and tested were built from wood, fibreboard, corrugated board, plywood and other materials.

A life-float designed and built from Canadian materials at the Laboratories was submitted to tests by the naval authorities and showed considerable promise. Some changes in the design have been made to improve the construction and the new design is undergoing further development.

An investigation to determine the effect upon strength of worm holes in fire-killed timber was commenced at the request of one of the provinces in which considerable damage had occurred to a large stand of jack pine from borer attack subsequent to a fire which killed, but did not destroy, large quantities of timber.

On request an investigation was carried out to determine the effect of weathering upon the strength of cross-arms with a view to determining whether their maximum working life is being utilized to the best possible advantage. Some of these cross-arms had been in service for twenty-five years.

The amount of check testing being carried out for the Department of National Defence and the Inspection Board of the United Kingdom and Canada has continued to increase. A considerable part of the time of the staff of the division is now taken up in testing materials submitted by these departments and the Department of Munitions and Supply. Testing of a similar nature has also been carried out for aircraft manufacturers upon metals, adhesives, and aircraft parts.

DIVISION OF WOOD PRESERVATION

Work was continued on the treatment with fire-retardants of timber and plywood for naval and military purposes and on the testing of fire-retardant paints for wooden buildings.

Records of tests to determine the service life of treated and untreated timbers, some of which have been under observation over a period of years, were kept up to date but the work was not extended during the year.

There are in use in Canada some 10,000,000 untreated line poles, representing an investment of $150,000,000. Prolongation of the service life of these poles would mean an immense saving of labour, material, and money.

In co-operation with various interested concerns, which contributed the necessary material and labour, stub cedar poles, subjected to six various types of ground-line treatment had been installed in a test plot at the Central Experimental Farm. These were analysed and examined, and a report was issued.

Some work was done on treatments to protect window sash from decay and to prolong the life of manila rope.

Processes to render wood plastic by impregnation with tanning agents and phenol-formaldehyde resins were investigated. The claims made for tanning agents were not substantiated but it was found that western white pine and western red cedar veneers could be compressed to a specific gravity of between 1 and 1·1, the veneer then being approximately one-half its former thickness.

The Department of Public Works was interested in the creosote treatment of white pine piling, and two charges were treated by the boiling-under-vacuum process.

A review was made of the literature regarding moisture-retardant coatings and a report issued.

Accelerated tests on wood preservatives by exposing small pieces of treated and untreated wood to the attack of fungi in glass jars filled with garden loam, at moisture contents of 20 to 30 per cent, were conducted in an attempt to find a better method of quickly evaluating wood preservatives.

DIVISION OF LUMBER SEASONING

Following a study carried out in the Laboratories, sugar maple was accepted as a substitute for black walnut in rifle furniture manufacture. The kiln-drying of maple rifle-furniture blanks was supervised by the Laboratories and additional manufacturing sources and suitable kiln-drying facilities were arranged for the firm manufacturing these rifles.

The study of kiln-drying eastern spruce with the least possible effect on the strength of the wood for aircraft construction was continued.

Urea-treated white pine deal, piled for several months since treatment, was inspected at time of shipment, but results indicated that a more intense treatment was necessary to obtain results sufficient to compensate for the extra cost. Gunstock blanks after short dips in saturated solutions of urea, and kiln-drying to 10 per cent moisture content, failed, without end-coating, to stand up to the standard drying schedule common to untreated blanks.

The year was featured by the numerous installations of modern dry-kilns made necessary by war requirements. The Laboratories were called on for advice with respect to a number of these installations.

DIVISION OF WOOD CHEMISTRY

Work was continued on the study of the yield and quality of pine tar obtained by the destructive distillation of various Canadian softwoods, encouraging yields being obtained from selected resinous sawmill waste of Douglas fir and white pine. Refining of the crude distillate was carried out with a view to determining the suitability of certain fractions for use in the rubber industry, for ore flotation, and for other industrial uses.

Increased consumption of gasoline for war purposes has directed attention to other substitute fuels, including producer-gas from wood or charcoal. A study was made of developments in other countries and some experimental work carried out on a truck fitted with a gas-producer. Assistance was rendered to committees of industry and of government interested in this specific subject, as well as in the general one of substitute fuels for internal combustion engines.

Difficulty has recently been encountered in obtaining genuine beechwood creosote, ordinarily imported from Europe for pharmaceutical purposes. Experiments were carried out with a view to determining the practicability of using Canadian beech in the preparation of this material.

A special beech charcoal was prepared at temperatures higher than those normally used in hardwood distillation. This charcoal was for use in experiments in the case-hardening of steel.

DIVISION OF WOOD UTILIZATION

The major work of the year was the formulation of tentative standard grading rules for Eastern Canadian spruce lumber. This work has been done in co-operation with the Trade Promotion Committee of the Canadian Lumbermen's Association with the support of the governments of the Provinces of Quebec, New Brunswick, and Nova Scotia. Data on the quality of spruce, obtained in the field last year, were tabulated and analysed, and the first draft of the grading rules based on these data was presented to the Committee in October, 1941. Later, an amended draft was submitted and approved, and by the end of the year the grading rules were in the hands of the printer.

Considerable time was devoted to work directly connected with the war effort. This work was concerned with such matters as the use of Eastern Canadian spruce for the construction of aircraft; various questions relating to construction lumber and other forest products for military establishments; and matters concerning the selection of suitable woods for specific war supplies.

Assistance was given to the Coal Administrator in connection with the use of wood and wood products for domestic heating and in compiling information useful to the consumer of wood fuel. Several problems which involved the selection of suitable Canadian woods to replace foreign woods previously imported were dealt with.

DIVISION OF TIMBER PATHOLOGY

Considerable losses in handling birch logs used for high-grade veneer were found to be largely due to faulty storage. It was found that storage under water gave one hundred per cent control, and this practice is increasing. Fungus infection of aeroplane wood caused numerous inquiries, and information was provided which would enable inspectors to evaluate the various stains and discolorations encountered.

Twenty creosoted jack pine ties, originally affected by red stain, which had been in service in a main-line track for twelve years, were examined. They were found in good condition, and there was no evidence of the spread or development of *Trametes pini*, although this organism was found yet alive in three of the ties. Some secondary wood-rotting fungi were found in five ties.

Some 7,000 red pine poles valued at approximately $20,000 were inspected for the presence of decay. A report on the inspection provided a basis for classification of the poles and their economical utilization. Further assistance was given to two pulp and paper companies in the adjustment of treatment for slime control in their mills.

Inspection was made of wood in a warehouse in which vigorous fungal attack was in progress, and recommendations were made for arresting the decay threatening the wood installed in the building.

TIMBER PHYSICS DIVISION

An investigation of possibilities for increasing the use of sawdust and planer-shavings for insulation was commenced, and a preliminary report was prepared for the lumber organization which had requested the work. Investigation of the use of sawdust and shavings is being continued with special reference to building code regulations with respect to insulation.

Various inquiries were dealt with regarding the selection of wood and specifications for wooden articles used by the Department of Defence and other departments directly concerned with war work.

Attention was given to the use of Canadian woods to replace foreign woods in ship construction; to the examination of material which had failed in aircraft, to determine the reason for such failures; and to the effectiveness of various proprietary moisture-resistant coatings for war materials.

VANCOUVER LABORATORY

The work of this Laboratory has shown increasing concentration on the use of timber for war requirements. On this account research work on several projects had to be suspended while others had to be modified to meet immediate requirements.

Some of the more important problems dealt with are noted hereunder:

DIVISION OF TIMBER MECHANICS

Standard tests were carried out on yellow cedar to determine its basic properties for many specialized uses, particularly boat construction. Tests were also carried out on Douglas fir of the Mountain type.

A special study was conducted on the effect of kiln-drying at various temperatures on the strength of Sitka spruce, in order to facilitate the drying of this material for aeroplane construction.

A series of tests was started on Douglas fir and western hemlock timbers, in three merchantable grades, as defined in the Export No. 1 Grading Rules of the British Columbia Lumber and Shingle Manufacturers' Association.

Recommendations, following special tests, have led to the acceptance on a rate of growth and specific-gravity basis of Sitka spruce for slicing, prior to the manufacture of laminated leading edges for aircraft.

Tensile and panel tests were made on three-ply Sitka spruce and on mahogany-faced three-ply with a Sitka spruce core, in connection with the substitution of spruce for mahogany in aircraft construction.

The use of Engelmann and white spruce from the interior of British Columbia to augment supplies of Sitka spruce of aeroplane quality was investigated, with the co-operation of interested parties.

DIVISION OF TIMBER PRODUCTS

The use of shed dryers for accelerating the air-drying of lumber received attention. Marked acceleration of the drying rate was shown by tests at one mill where large fans are used to circulate air through the stock in unheated sheds.

A study was carried out at a mill where exhaust steam was passed through steam pipes under piles of 1-inch lumber. The results indicate a much faster drying rate and a moisture content considerably below what is possible during winter months on the coast under ordinary air-drying conditions.

Investigations were made of the reaction during kiln-drying of certain imported hardwoods, in order to determine their suitability as substitutes for woods which are unprocurable owing to war conditions.

Attention was given to the use of western white birch and broad-leaved maple for flooring, as a means of relieving demands for oak. Tests were carried out to determine the effect of kiln-drying to a low moisture content upon the hardness of these species and the efficacy of a special synthetic resin treatment in retarding the pick-up of moisture in manufactured strips.

A study of western hemlock timbers treated with urea and bulk-piled for various periods prior to kiln-drying showed much less degrade in the treated than in the untreated pieces.

A shipment of urea-treated Douglas fir and western hemlock flitches was made to South Africa to determine what effect this treatment might have upon timbers bulk-piled for considerable periods in a ship's hold. The results indicate that checking is eliminated but considerable staining occurs.

Attention was given to the possible use of arbutus to replace briar for smoking pipes, and also to extensive termite damage in foundation timbers of a large factory.

The cause of decay in western birch logs, after a comparatively short period of storage, was investigated and improved storage methods were devised to greatly reduce or prevent loss from this cause.

Problems having to do with the cause and prevention of decay of wood in service included: rot in laminated floors of a large department store; decay in foundation and basement timbers resulting from faulty construction; and decay in red alder furniture stock during air-seasoning.

Examinations were made of a green stain found in considerable volumes of Douglas fir from certain areas; a brown stain in the ends of certain western birch logs, which caused wrinkling of veneers cut from them; red stain in western red cedar shingles; and a bark-like tannin inclusion in western hemlock classed as "black check" in the United States.

PULP AND PAPER RESEARCH INSTITUTE OF CANADA
MONTREAL

Since August 1, 1940, the Montreal Laboratory of the Forest Products Laboratories has formed part of the Pulp and Paper Research Institute of Canada. On that date, the Dominion Government, the Canadian Pulp and Paper Association, and McGill University, entered into a new agreement

whereby all their pulp and paper research was placed under a General Director responsible to a Joint Administrative Committee consisting of representatives of the three corporate bodies.

Both fundamental and applied research is carried on at the Institute.

FUNDAMENTAL RESEARCH STUDIES

In the manufacture of sulphate pulp, the lignin, which constitutes from twenty to thirty per cent of the content of softwoods, is a total loss. Studies of lignin structure indicate the possibility of utilizing this substance for increasing the production of valuable aldehydes and in the field of plastics.

A more efficient method of bleaching kraft pulp and a method of manufacturing vanillin from sulphite waste liquor, both developed at the Institute, are now in active commercial operation. Work on the hydrogenation of wood indicates the possibility of using lower pressures and cheaper catalysts.

APPLIED RESEARCH STUDIES

In studies of the groundwood method of producing wood-pulp, the need arose for an instrument capable of testing the character of the pulp, as to strength and stretch, when in the form of a wet sheet. Such an instrument was successfully devised, and a duplicate was, with the co-operation of the Institute, constructed by a commercial mill. In the hope that some relation between the strength of the sheet at the wet end of a paper machine and the behaviour of the sheet in the machine might be found, a third instrument was installed in another mill. As no definite relation was found, this showed that other factors were of greater influence.

Work was continued on the development of an electrical conductivity method for measuring the consistency of a dilute pulp suspension. A device giving satisfactory results under laboratory conditions was built, and was subsequently simplified with a view to making it commercially practicable. While certain modifications yet remain to be worked out, its ultimate industrial adoption seems likely.

An objective method of measuring the printing qualities of paper has been under study for some time past. The principal lines of approach have been the measuring of the fidelity of reproduction of a standard half-tone, and the Carlsson trial printing method, which consists of pressing the paper against a definite weight of ink spread on a glass plate. The study is complicated by the fact that quality is itself largely subjective, but much suggestive and valuable material has nevertheless resulted.

Readings obtained with the Mullen tester, an instrument widely used in the paper industry for measuring the bursting strength of paper, are unfortunately subject to two major errors, inherent in its design. Methods for considerably reducing these errors under commercial conditions were devised, thus much increasing the value of the instrument.

An instrument for measuring the foldability of boxboard—one of its most important qualities—was designed and constructed. Certain modifications suggested by its experimental application were made, and a standard method of testing is now being worked out.

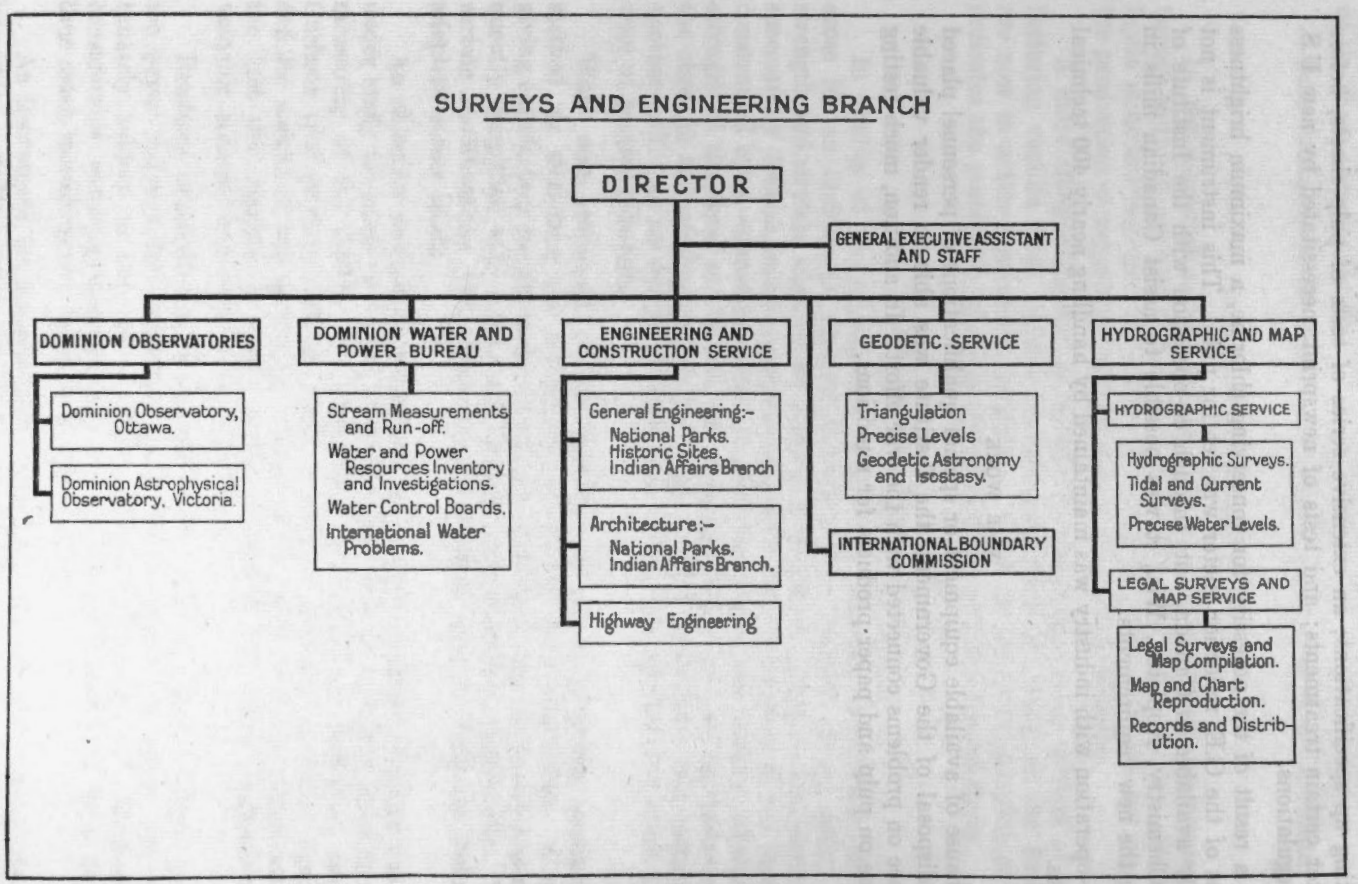
Other miscellaneous investigations covered building papers, to provide data for setting up specifications; an extensive series of tests of pulp sheets, before and after certain treatments; and tests of newsprint, necessitated by new U.S. tariff regulations.

As a result of the necessity for conserving chlorine, a maximum brightness in terms of the G.E. reflection meter was set for pulp. This instrument is not generally available in Canada, but, through co-operation with the Institute of Paper Chemistry, Appleton, Wis., it was possible to assist Canadian mills in meeting the new requirements.

Co-operation with industry was maintained by handling nearly 400 technical problems.

WAR WORK

Because of available equipment or special qualifications of personnel placed at the disposal of the Government, the Institute was able to render valuable assistance on problems connected with the war effort. In addition, much testing was done on pulp and paper products for munitions.



Organization Chart, Surveys and Engineering Branch.

SURVEYS AND ENGINEERING BRANCH

J. M. WARDLE, DIRECTOR

The fiscal year ended March 31, 1942, showed an increase in the volume and variety of work being undertaken by the various Services of this Branch relative to Canada's war effort.

The amount and urgency of the mapping work being undertaken by the Hydrographic and Map Service was further increased. The requirements of the Army, Air, and Naval Services of the National Defence Department for maps and hydrographic charts were greater than ever before and covered wider areas. Early in the summer of 1941 preliminary maps were compiled covering the air route from Edmonton to Alaska, via Fort St. John, Fort Nelson, and Whitehorse. The entrance of the United States into the war late in 1941 resulted in an immediate demand from the United States Army and the United States Army Air Force for existing maps and map information. Colour prints of many map sheets were supplied the United States authorities for reproduction purposes. Towards the end of the fiscal year mapping programs covering large areas in Northern Canada, both east and west, and in which Canada and the United States will both participate for defence purposes, were under consideration. This work involves the immediate issue of preliminary map sheets by the Hydrographic and Map Service, with final editions to follow when air surveys are completed by the United States Army Air Force.

In addition to the standard air navigation maps printed for the R.C.A.F. for training schools and operational duties, special maps on British specifications were prepared for final air training purposes.

The Hydrographic Service was busy on special soundings and harbour surveys, practically all of which were directly connected with the war. Work was undertaken on the Atlantic and Pacific Coasts and on the Gulf of St. Lawrence. Special navigation charts were issued for Navy purposes.

During the year the Engineering and Construction Service assumed the responsibility of several important war projects.

In the spring of 1941 work camps for conscientious objectors were established and operated by this Service on the Trans-Canada Highway in Ontario, and on an important north and south road in Saskatchewan. These camps provide work for those citizens of Canada who are exempt from military service because of religious beliefs. The men are given board and paid a nominal sum for their work in the highway camps.

As an urgent measure for the R.C.A.F., the location of 38 miles of highway to connect Gander Lake air centre in Newfoundland with the harbour of Lewisporte was undertaken. While this work was under way location requirements were extended to cover a road to Bishop's Falls. The Lewisporte section was completed and a good portion of the extension to Bishop's Falls under way before the field parties were disbanded for the winter.

In February, 1942, the Engineering and Construction Service undertook the establishment and operation of highway construction camps on certain main highways in British Columbia, to provide work and a livelihood for men of Japanese origin who were moved from the Pacific Coast areas of British Columbia. The original program called for placing 2,000 Japanese on the uncompleted section of the northern Trans-Provincial Highway from the vicinity of Yellowhead Pass to Blue River, B.C.; the placing of some 1,400

Japanese on the uncompleted section of the southern Trans-Provincial Highway between Hope and Princeton, B.C.; and the placing of 600 Japanese on improving narrow sections of the Trans-Canada Highway between Revelstoke and Sicamous. The men were established in 100-man camps, which were erected as quickly as possible. The establishment of these camps under winter conditions and under great pressure was a project of considerable magnitude.

In February, 1942, Canadian Government authorities decided that the highway leading easterly from Prince Rupert to Hazelton, B.C., should be completed as an urgent defence measure, and the Department of Mines and Resources was charged with this work through the Surveys and Engineering Branch. As the road was not surveyed, arrangements were made for location parties to be placed in the fields as quickly as possible and the Engineering and Construction Service immediately began to prepare plans and specifications for construction by contract. Preparatory work was well under way by the end of the year under review.

The Geodetic Service undertook important work of a research nature for the National Defence Department on both the Pacific and Atlantic Coasts. It supplied a great deal of map control information—both horizontal and vertical —to United States authorities and which was available from its triangulation records, from its field activities in geodetic astronomy, and from its precise level records. Triangulation work was continued along the north shore of the Gulf of St. Lawrence and two important nets of secondary triangulation were completed along the west coast of British Columbia.

The Dominion Water and Power Bureau continued its water-power administration work and the collection of important hydrometric data throughout Canada. This latter work has become increasingly important because of the demand for power from all sources by war industries. This Bureau gave assistance to the office of the Power Controller, not only by supplying water-power data but by assisting in the analyses of the power output and power possibilities of various hydro-electric plants.

A senior official of the Bureau acted in an advisory capacity with the International Committee on the St. Lawrence Waterway project, and other Bureau officials continued their duties as members of various Boards of Control that regulate river and lake water levels in which the Dominion has an interest.

The Dominion Observatories at Ottawa and Victoria, while short of staff due to the transfer of technical men to war work, continued their more important programs. A very useful development took place in the time service at the Ottawa Observatory, a new Master Clock being purchased and arrangements being made to improve time broadcasts. An interesting feature in this connection was the passing of an Order in Council that designated time determined by the Dominion Observatory at Ottawa as official time for Canada. While prior to this official time had been designated as Greenwich time at certain meridians of longitude, there had been no general definition as to the source from which such time would be obtained. As a result of this Order in Council all Dominion Government activities now have one official time and it is expected that the various provinces will, in due course, accept Dominion Observatory time as their official standard.

The greatly expanding war activities of the Branch during the past fiscal year have made it increasingly difficult to keep up-to-date the regular and basic work of its various Services. The absence of technical men of the staff who have enlisted, or who have been loaned to various war departments for the duration, is being severely felt, particularly as it is difficult to replace them with competent temporary help.

The activities of the Surveys and Engineering Branch are provided for through its own votes, and through funds made available by other Government

Branches or Departments for work done in their interests. In the case of projects relating to the war, votes were allotted the Branch from the War Appropriation Vote.

The following tables give the total expenditures made:—

Regular Votes	$1,127,643 82
Special Votes	18,423 78
War Appropriation Vote—	
Alternative Service Work Camps	96,194 97
Prince Rupert-Terrace-Cedarvale Highway	10,469 86
Construction Camps for Japanese	70,497 18
	$1,323,229 61

Expenditures of moneys made available by other Branches and Departments as follows:—

	Regular Votes	Special Votes	Trust Funds	Total
To Engineering and Construction Service from—				
Lands, Parks and Forests	$ 4,397 16	$267,125 65	.....	$ 271,522 81
Indian Affairs	27,159 71	6,962 95	$3,304 78	37,427 44
National Defence (Air)	.....	10,919 84	.....	10,919 84
				$ 319,870 09
To Legal Surveys and Map Service from—				
Indian Affairs	2,340 97	.....	.....	$ 2,340 97
National Defence (Air)	.....	27,231 01	.....	27,231 01
				$ 29,571 98
To Geodetic Service from—				
National Defence (Army)	.....	1,892 02	.....	$ 1,892 02
To Hydrographic Service from—				
National Defence (Naval Service)	.....	3,230 43	.....	$ 3,230 43
Total Expenditure				$1,677,794 13

DOMINION OBSERVATORIES

The Dominion Observatories at Ottawa and Victoria continued work on various programs with increasing attention to war problems in any way connected with geophysical and astronomical practice and research.

DOMINION OBSERVATORY, OTTAWA

The Dominion Observatory at Ottawa has done extensive research work on the refinement of the national time service, and, in view of war necessities, introduced during the year improvements for greater precision in time reception, comparison, and broadcasting, and also in the control of frequencies; special magnetic surveys were made and navigational magnetic data accumulated; and instruction was given on air navigation and time problems, and on general phases of astronomy to several groups of members of the R.C.A.F.

Observing conditions continued below normal, but satisfactory results were obtained from most of the work undertaken.

Various members of the staff attended the two following important annual meetings in May, 1941, and presented papers on astronomical and geophysical subjects: Eastern Section of the Seismological Society of America, Washington; and Royal Society of Canada, Kingston.

The usual meteor observing was much restricted owing to adverse conditions; however, some useful visual and photographic results were obtained during the Perseid shower in August.

The Observatory was open to visitors each Saturday evening and the equatorial telescope made available when the sky was clear. Numerous daytime visitors were instructed in the use of research equipment. Lectures on general scientific subjects were given to various gatherings and young people's groups, including one on "Time Determination and Distribution" before the Montreal Centre of the Royal Astronomical Society of Canada, and one on "Life in the Universe" before the Ottawa Centre. A group of young people of collegiate age, sponsored by the Ottawa R.A.S.C. Centre, formed a Junior Astronomical Club with regularly elected officers, and twelve successful meetings have since been held, all at the Observatory under the direct supervision of two astronomers of the staff and two technical high school teachers.

Position Astronomy and Time Service.—With the meridian circle, 1,255 fundamental observations were made for right ascension and declination. The instrumental constants were determined, and the computations carried on.

With the reversible transit, observations for correct time were made on 143 nights. The primary sidereal clock maintained a satisfactory rate and continued to synchronize the two signal clocks which control all the mean time circuits, including the various time signals, circuits operating chronographs, minute and seconds dials, seismograph shutters, and the Government and outside clock systems.

Time signals were sent continuously by wire to the Canadian National Telegraph Company, the Canadian Broadcasting Corporation, the Monitoring Station of the Department of Transport, and to the National Research Laboratories. Wireless time signals were transmitted directly from the observatory station CHU on 3330, 7335 and 14670 kc. continuously; also through station VAA on 11990 kc. daily except Sundays and holidays, and through the Canadian Broadcasting Corporation chain of stations daily. Wireless time signals were received daily from Arlington, Bordeaux, Monte Grande, Nauen, Rio de Janeiro, and Rugby, and comparisons forwarded monthly to other co-operating observatories. Experimental work with tube amplifiers, relays, and recorders was continued to provide further improvement in transmission and reception of time signals, in time records of earthquake and rock burst waves, and in synchronizing standard and secondary clocks.

The synchronized time service of 700 electrically-driven clocks in the various Government buildings in Ottawa was maintained with a minimum of interruptions. Chronometers, watches, and other timing mechanisms were overhauled and rated for various Government departments.

The time determined at the Dominion Observatory was designated by Order in Council of August 28, 1941, as official time for Dominion official purposes. Previous to this the only regulations in force had been those of the various provinces and the Northwest and Yukon Territories, designating zones of standard time as the times corresponding to certain degrees of longitude, but no agency had been designated as the official source from which this time should be derived. This was scarcely a logical situation, and since in practice the Dominion Observatory was the only source of accurate time determination in Canada it seemed proper to give this fact official recognition.

A crystal controlled Primary Frequency Standard was purchased as an addition to the previously inadequate primary clock equipment of the Observa-

tory with a view to modernization of the methods for providing continuity of exact official time and raising the efficiency of the control system for the precise standardization of frequencies in general use for broadcasting, airways and flying fields, synchronized power plants, commercial and research laboratories, and other organizations. The addition of this primary frequency standard, or crystal clock, advances Observatory frequency standards to approach a precision of the order of one part in ten million, necessary for war time and other recent requirements, establishes a more adequate control in the determination of clock rates within approximately one-hundredth of a second per day, and provides a further guard against primary clock failure and rate changes, especially during periods of adverse weather conditions which prevent star observations, on which the control of time and frequencies ultimately depends.

Terrestrial Magnetism.—Field observations, between June 15 and November 25, were restricted to areas for which specific magnetic data were most urgently in demand by the Naval Intelligence Service, Royal Canadian Navy, the British Admiralty, and the United States Navy Department. Seven stations in Newfoundland, three in Nova Scotia, and one in Ontario were occupied. On request by the Naval Service, and in co-operation with the Hydrographic Service of Canada, more than a month was spent in making a survey of two strategic harbours in Newfoundland, involving astronomical observations for latitude and longitude, detailed observations of magnetic elements for charting, computation of the annual declination change, and the determination of precise index corrections for five hydrographic survey compasses by reference to magnetometer CIW No. 20 at the Dominion Observatory magnetic station in one of these localities. The instruments employed in field operations were compared in May and in October with the Dominion Observatory standards at Long Island, the Ottawa B station.

For British Admiralty requirements determinations of magnetic elements were made on three of the magnetic comparison piers in the test laboratory of the Ottawa Service Depot of the Ontario Hughes-Owens Company, and a La Cour type declination instrument was loaned to them for the standardization of marine and aircraft compasses.

The observations of inclination and total force obtained by the British Canadian Arctic Expedition, 1936-1940, were computed for final values.

Magnetic and astronomical data from Dominion Observatory magnetic stations in the Eastern Arctic were supplied to the Department of Terrestrial Magnetism, Carnegie Institution of Washington, to facilitate the reduction of magnetic observations made by the 1941 Louisa A. Boyd Arctic Expedition.

Other magnetic survey results were supplied from time to time in answer to applications from the Department of National Defence, commercial and scientific organizations, and surveyors.

The magnetic observatories at Agincourt, Ontario, and Meanook, Alberta, provided the usual continuous photographic records of horizontal force, vertical force, and declination, with practically no interruption. The Meanook La Cour type variometers were transferred from temporary to permanent housing in the enlarged basement of the observatory. Rigid piers and improved temperature conditions have greatly reduced former variations in level and azimuth, providing better base-line control with increased accuracy in records of the magnetic elements.

Preliminary computations and reductions of the records of both observatories have been completed to the end of 1941.

Co-operative international research on magnetic activity was continued, and regular reports were prepared for the co-operating institutions. Special

reports on magnetic data in Canada were also prepared, on request, for several other research institutions and independent investigators in foreign countries.

Seismology.—The teleseismic seismographs at Victoria, Saskatoon, Toronto, Ottawa, Seven Falls, and Halifax, and the short-period seismographs at Kirkland Lake, Ottawa, Shawinigan Falls, and Seven Falls were maintained in continuous operation, and interpretation of records was kept up to date.

Five hundred and forty-nine earthquakes were recorded in Canada, nine being sufficiently well-defined for reports to the Press and to Science Service, Washington. All registrations were regularly reported to the principal world seismological stations, still available, through the usual medium of monthly bulletins. Reports on the two Quebec stations were made each month to the co-operating agency. Local registrations were reported as usual to the central station of the Northeastern Seismological Association at Weston, Mass., in connection with seismic studies covering Eastern Canada and the Northeastern States.

Selected Canadian seismograms were loaned to several research stations in the United States and Mexico for special investigations of continental seismic problems.

The rock burst research program at Kirkland Lake was continued and is yielding data for a satisfactory study. Considerable work was done on the measurement of diamond drill hole distortion under pressure. Methods of detecting mine disturbances and of recording subaudible rock-strain vibrations have been under study and experiment in search of means for predicting rock bursts. Mr. L. A. Obert of the United States Bureau of Mines visited mines at Sudbury and Kirkland Lake in October with Observatory officials and carried on investigations with detection apparatus of his own design. A severe rock burst at Lake Shore Mines on July 30 was well recorded on the Ottawa seismographs, which provides material for a study of the transmission time of the ground waves.

The Seismologist visited several institutions in the United States for investigation of various geophysical problems, including seismic prospecting for oil, rock burst research and experimental apparatus, and geological faults under the surveyed foundations of the St. Lawrence Waterway.

Gravity.—Gravity operations and investigations were suspended as a war measure early in 1941; however, questions on various problems and requests for publications have been attended to as occasion required.

Solar Physics.—Nineteen direct solar photographs taken during the year show a decrease in sunspot numbers from the average cycle, as was to be expected.

Preparation for publication of 1911-1914 solar rotation observations and reductions for λ 5600 was continued, following a recomputation of velocity factors, in which the latest determinations of wave-length and velocity of light were used; differences from previous results were inappreciable.

In order to secure observations of solar rotation at latitudes near the solar pole, required in connection with explanations of the new law of solar rotation, a sliding mask was devised and installed on the solar spectrograph for taking limb and centre spectra alternately when the pole was farthest from the limb; however, observing conditions proved unsuitable for these observations, which were planned for November and March.

Among requests for information on sunspot influences, one in regard to snowfall in relation to logging operations involved an investigation for the North Bay region through the last two complete sunspot cycles.

Fifteen-inch Equatorial.—Occasional observations were made with the photo-electric photometer on *zeta* Geminorum and *alpha* Virgins. The routine computations of these observations were completed.

Photographic Photometry.—No work on Cepheid variable star fields and the program for the determination of star magnitudes was undertaken. However, the 6-inch doublet telescope, cameras, etc., were overhauled and provision was made against deterioration during disuse.

Publications, Reports, and Bulletins.—Two numbers of the regular series of Publications of the Dominion Observatory were issued, as follows: Vol. XIII, "Bibliography of Seismology", Nos. 9 and 10. This Bibliography was previously issued quarterly, but owing to a reduction in volume due to the war it has been restricted to two issues per year, beginning with the year 1941. The regular report, "Record of Observations at the Magnetic Observatories, Agincourt and Meanook", for 1934-1935 was prepared and edited at the Dominion Observatory and awaits publication and distribution by the Department of Transport. Quarterly reports on the magnetic character of the day for 1941 were sent to the International Association of Terrestrial Magnetism and Electricity at Lausanne, Switzerland, and the Department of Terrestrial Magnetism, Carnegie Institution, Washington, D.C. The following bulletins, pamphlets, and brochures were issued and distributed: Wireless Time Signals (monthly); Seismological Bulletin (monthly); Northeastern Seismological Association Bulletins (Nos. 65 to 86); The Rockhurst Research at Kirkland Lake (Nos. 5, 6, 7); The Interior of the Earth Viewed in Its Relation to Earthquake Causes: The Viewpoint of Seismology; Saturday Evening Program (quarterly); tables of sunrise and sunset, moonrise and moonset, phases of the moon, eclipses; and numerous questions were answered by special pamphlets, or correspondence, on standard time and time zones; differences between local, standard, and daylight saving time and its legal applications; the influence of the sunspot cycle on special problems; and general questions on astronomy.

DOMINION ASTROPHYSICAL OBSERVATORY, VICTORIA, B.C.

Instrumental equipment was improved in several respects during the year. The steel tank forming the vacuum chamber for aluminizing the 72-inch mirror has been constructed, and the mounting of the electrodes and other auxiliary equipment is being proceeded with. The reconstruction of the three-prism spectrograph, effectively transforming it into a six-prism instrument, with provision for additional use of a grating if desired, has been partially completed. A portable 6-inch reflecting telescope was purchased for instructional purposes. Improvements were made in the mechanism for operating the dome shutters and wind curtains. A suitably darkened room was constructed for housing the projection measuring machines to improve facilities for the precise measurement of spectra for radial velocities and wave-lengths; also a new photographic dark room.

Contributions to the war effort were made in various ways: Dr. Andrew McKellar was loaned to the University of British Columbia at Vancouver for the academic year 1941-42, on request by the National Research Council; weekly lectures were given on practical astronomy to the Officers' Training Corps of Victoria; instruction on gas warfare was given to air raid wardens; and advice and assistance were given on the care and renewal of searchlight reflectors.

Approximately 20,000 people visited the Observatory during the year. From April to September, Saturday evening visitors viewed celestial objects

through the telescopes, and in July and August illustrated lectures were given prior to the observing periods.

Two members of the staff attended the meeting of the Royal Society of Canada at Kingston in May, 1941, and proceeded to Ottawa on departmental business. Dr. J. A. Pearce represented the Observatory at an Inter-American Scientific Conference held in Mexico City in February, 1942, in connection with the formal opening of the National Astrophysical Observatory at Tonanzintla, Puebla, and took part in symposia on galactic structure and related subjects.

Observations.—Observing weather was ten per cent below average. On 187 nights, 1,094 spectrograms were secured, as compared with the 23-year average of 200 nights and 1,298 spectrograms.

Current observing programs involve extensive investigations requiring some years for completion. They are as follows:—

(*a*) Studies of class B stars north of the celestial equator and fainter than the 7th magnitude.

(*b*) Radial velocities of 150 A- and B-type stars, previously studied at Victoria, but requiring further observation.

(*c*) Investigation of the dynamical and physical properties of spectroscopic and eclipsing binaries.

(*d*) Investigation of Wolf-Rayet, *P Cygni*, and emission-line stars.

(*e*) Studies of R- and N-type stars within 100° north polar distance and brighter than the 9th magnitude.

(*f*) Photoelectric photometer determination of the colours of several hundred distant stars.

(*g*) High dispersion investigation of spectral line intensities in solar-type stars.

Spectroscopic and Spectrophotometric Research.—Binaries: A circular orbit was computed for the double-lined A-type binary H.D. 203858, and the absolute magnitudes of its components were determined spectrophotometrically. An orbit for the single-lined B9 star H.D. 34762 was completed. An accurate orbit for 1940-41 for the eclipsing variable *AR Cassiopeiae* was derived from 30 recent Victoria observations, 67 Allegheny spectrograms were remeasured and elements for 1908-09 redetermined, and revised elements were also deduced from the Yerkes and Michigan observations 1933-36. From the four orbits it was shown that the line of apsides advances in a period of 435±125 years; theory would predict a period of the order of 400 years. An accurate orbit was derived from 25 spectrograms for the recently discovered 8th magnitude eclipsing binary H.D. 227696, which turns out to be a very massive system with its components having masses of 16·7 and 12·8, and radii of 6·6 and 5·2 times the sun respectively. Observations are practically complete for 24 binaries, and plate measurements fairly advanced. *Emission-Line Stars:* Sufficient plates of the peculiar spectrum variables H.D. 41511, 45910, 51480, 190073, and 207757 have been obtained to provide reliable data for measurements of intensity and velocity. A detailed analysis of the spectrum of one of these, H.D. 190073, has been completed for publication. This *P Cygni* star has a complex atmosphere consisting of an underlying reversing layer with ordinary A-type properties, and an outer envelope of outward-moving atoms giving rise to the *P Cygni* characteristics. *Solar-Type Stars:* Spectra, extending from λ 4028 to λ 6752, of four solar-type stars, including the sun, were obtained by using the three-prism spectrograph with a bright-first-order grating, and detailed spectrophotometric measurements of the equivalent widths and intensities of about 600 spectral lines were made. The deduced excitation temperatures are: the *sun* 4400° ± 100°K, *gamma Cygni* 5375° ± 75°K, *alpha Persei*

6275° ± 150°K, and *alpha Canis Minoris* 5275° ± 150°K. *R- and N-Type Stars:* The unidentified bands in the spectra of N-type stars have been found to be especially strong in the variable star *RY Draconis*. Wave-length measurements of these bands from several spectra of the same star exhibit certain regularities in wave-number differences that may aid in the eventual identification of the bands, which have not yet been produced in the laboratory. The resonance line of Lithium I, λ 6708, which was discovered last year in stellar spectra for the first time has now been found in eighteen N-type stars. *Interstellar Molecules:* An extensive table has recently been prepared giving the wave-lengths arising from the lowest states of about thirty of the more commonly occurring diatomic molecules composed of at least one cosmically abundant atom. These are the interstellar lines to be expected if the molecules under consideration are present in sufficient quantity in interstellar space. A discussion of all the work on interstellar molecular absorption up to April, 1941, is included in the publication, "Molecular Lines from the Lowest States of Diatomic Molecules Composed of Atoms Possibly Present in Interstellar Space", which is in press.

Seismograph Service.—The seismographs were maintained in operation, and 256 earthquakes were recorded.

Publications, Papers, and Addresses.—Three numbers of the regular series of Publications were printed and distributed: Vol. VII, No. 12, "The Determination of the Magnitude Difference Between the Components of Spectroscopic Binaries"; Vol. VII, No. 13, "The Spectrographic Orbit of H.D. 207826 (Boss 5620)"; and Vol. VII, No. 14, "The Spectrographic Orbits of H.D. 207650". Twelve technical papers were presented before scientific societies, and six articles published in astronomical journals. Twenty-one illustrated addresses on popular astronomy were delivered to societies in Victoria and Vancouver, and eighteen staff seminars were held.

DOMINION WATER AND POWER BUREAU

The necessity of providing a steadily increasing flow of power to war industry lent emphasis to the work of the Dominion Water and Power Bureau which continued collecting, recording, and making available data relating to the water and power resources of Canada.

WATER AND POWER

Lake of the Woods Regulation.—During the year the run-off throughout the Lake of the Woods watershed was well above normal and reached flood proportions in September, October, and November. Lake level rose from elevation 1056·36 on April 1, 1941 to elevation 1061·0 on September 23, at which point the regulation became subject to the approval of the International Lake of the Woods Control Board. The control facilities were so operated that lake level crested at elevation 1062·0 on October 23 and was brought down to elevation 1061·0 on December 15 when the regulation again became the responsibility of the Canadian Lake of the Woods Control Board. The outflow was continued at above normal rates throughout the winter months and lake level was drawn down to elevation 1060·14 on March 31, 1942.

Lac Seul Regulation.—The actual regulation of Lac Seul remained under the control of the Hydro-Electric Power Commission of Ontario acting in co-operation with the Lake of the Woods Control Board. The run-off was above normal and reached flood proportions in September, October, and November.

Lake level rose from elevation 1164·33 on April 1, 1941 to elevation 1171·76 on October 23 and was drawn down to elevation 1166·82 on March 31, 1942.

Snow Survey.—The fourteenth annual snow survey in the Lake of the Woods and Lac Seul watersheds was carried out during the first week of March in co-operation with the United States Engineer Office at Duluth, Minnesota, and the Hydro-Electric Power Commission of Ontario. The results show that the water content of the snow was 49 per cent of the average for the 14-year period.

Water Power Administration

In December, 1941, the Calgary Power Company Limited filed an application for a licence to develop the Russell water-power site on the Bow River, and a survey permit was issued so that development plans may be prepared. This site lies in the Stony Indian Reserve between the company's Horseshoe and Ghost developments and is capable of producing about 30,000 continuous horsepower under a head of 135 feet.

In connection with its water-power development on the Yellowknife River in the Northwest Territories, described in last year's report, the Consolidated Mining and Smelting Company of Canada, Limited, has filed plans for a storage dam at the outlet of Duncan Lake to retain about 100,000 acre-feet of water. It is expected that the dam will be completed during the summer of 1942.

Work by the Calgary Power Company, Limited, on the combined storage and power development in Banff National Park, also described in last year's report, was continued. During 1941-42 the main dam across the outlet of Lake Minnewanka, 1,900 feet long and containing about 800,000 cubic yards of material, was substantially completed as well as the power canal, pipeline, tailrace, and transmission lines. Most of the machinery has been installed in the power-house and the development is expected to be ready for testing by the end of May.

In order to avoid apprehended difficulties in the construction and operation of the power canal at the level originally proposed, the company was permitted to raise the grade elevation of the canal about twenty feet or about ten feet above the minimum draw-down level in the lake reservoir. To supply water to the power-house at the lower lake levels and maintain a safe range of levels in the power canal, a permanent pumping installation, consisting of three electrically-driven pumps with a combined capacity of 700 cubic feet per second at 19-foot head, is being constructed as part of the canal control works. The inflow to Lake Minnewanka was abnormally low during the past season and at the end of the fiscal year the lake was still several feet below the normal minimum level for the new development.

Technical Assistance to Indian Affairs Branch

In furtherance of applications filed under the British Columbia Water Rights Act, three conditional water licences were obtained for irrigation and domestic purposes serving reserves in Lytton, Okanagan, and Stikine Agencies, and for the same purposes eleven final licences were secured in confirmation of Indian rights to the use of water, four in Kamloops Agency, three in Williams Lake Agency, two in Lytton Agency, and one each in Kootenay and Bella Coola Agencies.

In connection with conditional licences appurtenant to Indian reserves which called for completion of works or putting the water to beneficial use by December 31, 1940, representations were made to the Provincial Comptroller of Water Rights as to sixteen licences. Extensions of time were granted for five

licences, ten were ordered for final licence surveys, and one was held in abeyance.

The Water-Power Resources of Canada

Canada's total hydraulic installation at January 1, 1942, was 8,845,038 horse-power and therefore represented a utilization of slightly less than 20¼ per cent of the total estimated potential capacity of 43,700,000 horse-power.

Census of the Central Electric Station Industry

Canada's central electric station industry generates more than 98 per cent of the electricity sold for use in Canada or for export to the United States, from water power, utilizing 7,843,625 horse-power or 88·7 per cent of the Dominion's total hydraulic development for that purpose. Approximately 32¾ billions of kilowatt hours of hydro-electricity were generated during the calendar year 1941 and approximately 70 per cent of all power equipment employed in Canadian industrial production and in mining, smelting, and refining, was operated by purchased hydro-electricity.

DOMINION HYDROMETRIC SERVICE

The Dominion Water and Power Bureau carries on the work of securing and compiling stream measurement records throughout Canada under co-operative arrangements with the various provinces.

Run-off Conditions in Canada.—The run-off for the year varied widely throughout Canada but on the average was about normal. Low run-off was general in the Prairie Provinces and flood run-off was general in the area extending from the Red River Valley eastward across northwestern Ontario. A new minimum rate of run-off was recorded in the Assiniboine River at Headingley in January, and a new maximum rate of run-off was recorded in the Upper English River at Sioux Lookout, Ontario, in October. The flood flow in the English River was typical of the September and October floods in northwestern Ontario; all storage reservoirs were filled and the run-off continued at above normal rates throughout the winter. As a consequence the level of Lake Winnipeg rose almost two feet during the year.

In the Pacific drainage typical stations showed a range in run-off from 80 per cent of the long term mean in the Kootenay River at Wardner to 104 per cent of the long term mean in the North Thompson River at Barriere. In the Arctic and Western Hudson Bay drainage, typical stations showed a range in run-off from 40 per cent of the long term mean in the Assiniboine River at Headingley, Manitoba, to 175 per cent of the long term mean in the English River at Sioux Lookout, Ontario. In southern Saskatchewan, in the Mississippi drainage, the yearly run-off of Horse Creek near the International Boundary was 40 per cent of the long term mean. In the St. Lawrence and Southern Hudson Bay drainage, typical stations showed a range in run-off from 70 per cent of the long term mean in the St. Francois River in southern Quebec to 129 per cent of the long term mean in the Harricanaw River in northern Quebec. In the Atlantic drainage, typical stations showed a range in run-off from 85 per cent of the long term mean in the Lepreau River in southern New Brunswick to 127 per cent of the long term mean in the St. Mary River in eastern Nova Scotia.

Power and Special Investigations

In British Columbia, special investigations of hydraulic conditions on Kootenay River and the West Arm of Kootenay Lake, Columbia River, Pend d'Oreille River, Skagit River, Okanagan River, and Phillips Creek were con-

tinued. On all of these waters there are international problems of importance to Canadian interests. Assistance was given to the Department of Public Works in a major hydraulic problem involving the development and maintenance of permanent ship channels in the Fraser River from the City of New Westminster to the sea and engineering studies of importance were made on Vancouver Island streams for the Department of Fisheries in connection with the Pacific Biological Station and for the Department of Agriculture at Kamloops in connection with irrigation problems. Co-operation was given the Engineering and Construction Service in supervising the highway construction program carried out by the Province of British Columbia with Dominion assistance. Investigations were also made for the Lands, Parks and Forests Branch of the Department in connection with administrative problems on various reserves and properties including the construction of monuments for the Historic Sites Board.

The Twentieth Annual International Snow Survey on the Upper St. Mary River in Glacier National Park, Montana, was carried out early in May 1941 in co-operation with the United States Geological Survey and in March 1942 the Sixth Annual Bow River Snow Survey was made in the vicinity of Lake Louise, Alberta. Extensive studies were again made in the Milk and St. Mary River basins for the purpose of determining the natural flow of the St. Mary and Frenchman Rivers at the point where each stream crosses the International Boundary. Co-operation was also continued with the Calgary Power Company in studies of water storage and power possibilities on the upper reaches of the Bow River and its tributaries.

In Saskatchewan and Manitoba, special investigations of the water supply situation in the Souris River watershed were made throughout the open-water period, particular attention being given to conditions in the river channel in Manitoba following the release of water from the reservoirs in North Dakota immediately south of the International Boundary.

In Ontario, special investigations were made in co-operation with the Hydro-Electric Power Commission of Ontario of the discharge from the control dam in the diversion channel delivering water from Long Lac to Lake Superior. Check measurements of flow in the Canadian power canal at Sault Ste. Marie were made for the International Lake Superior Board of Control. On Niagara River, studies were continued of river slopes and discharge and special attention was given to hydraulic problems in connection with the construction of remedial works in the river above the Falls undertaken jointly by the Governments of Canada and the United States. Special investigations of hydraulic conditions on South Nation River were repeated during the freshet period of 1941 at the request of the Department of Public Works. Snow surveys were again undertaken for the Hydro-Electric Power Commission of Ontario in the watersheds of Wanapitei, Sturgeon, South, and Muskoka Rivers.

In Quebec a special investigation was made of an international drainage problem on the St. Regis Indian Reserve. Special studies also included investigations of backwater effect, metering and rating of storage reservoirs, checking of power station ratings in co-operation with various power organizations, and maintaining special gauges in Richelieu and Magog Rivers in connection with international matters.

In New Brunswick an inspection 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 in 1941.

In Nova Scotia a series of investigations was made for the Department of Munitions and Supply of sources of water supply in the Halifax-Dartmouth area and estimates were prepared for alternative sources under consideration. This work was made necessary by the heavy demands upon municipal water supply arising from the greatly increased population in the area, both civil and

military. A complete report on the Paradise Brook development was prepared for the Nova Scotia Power Commission. The Nova Scotia Light and Power Company Limited was provided with plans and other data on the Black and Sackville Rivers and a detailed study of water supply and storage levels for the St. Croix River plants, as affected by increased power output and diversion from Ingram River, was prepared for Minas Basin Pulp and Power Company. Reconnaissance investigations in connection with power and storage projects were made at West River Sheet Harbour, Rawdon River, and Gold River.

St. Mary and Milk Rivers Water Development Committee.—This Committee was established by authority of Order in Council P.C. 682, dated February 17, 1941, to make a thorough study of the additional works required to utilize fully the share of St. Mary and Milk Rivers apportioned to Canada by the International Joint Commission in its order of October 4, 1921.

Under the chairmanship of the Controller of this Bureau, the committee held numerous meetings in Alberta where much information was obtained and at which representations were made by organizations and individuals interested in the conservation and beneficial utilization of these waters.

The Committee met in Ottawa during February, 1942, and completed its report.

INTERNATIONAL WATERWAY MATTERS

Among the more important matters dealt with during the year were the following:—

Attention was given to international problems which arose in the Columbia-Kootenay River basin. Field investigations and office studies were made and submissions were presented to the International Joint Commission in connection with hydraulic problems arising from the application of the United States Government to the Commission for approval of the construction and operation of the Grand Coulee dam and reservoir. Bureau and United States engineers continued joint studies of hydraulic conditions of the Kootenay River and reached agreement on several important matters in connection with the regulation of Kootenay Lake.

The International Souris River Board of Control, which was appointed in 1941 with the Controller of the Bureau as the Canadian member, commenced its duties in connection with recording and apportioning the flow of the Souris River.

The collection of hydrometric records of the Roseau River and its tributaries in Manitoba was continued.

Attention was given to problems arising from the Convention between Canada and the United States, providing for the emergency regulation of Rainy Lake and other boundary waters in the Rainy Lake watershed.

The International Boards of Control which functioned during the year were those relating to Kootenay Lake, St. Mary and Milk Rivers, Rainy Lake, Lake of the Woods, Prairie Portage, Lake Superior, Niagara, Massena, Lake Champlain, and St. Croix River.

REVENUE

During the year sums aggregating $30,822 were received from the various provinces in support of the co-operative resources studies; $89,531 was received from the Province of Manitoba in connection with the capital and operating costs of the Lake of the Woods and Lac Seul storages as provided by the Natural Resources Transfer Agreement and $4,813 was collected as revenue from

water-power licences, etc. In addition, $3,500 was received in connection with a water-power development on the Bow River on behalf of, and was remitted to, the Indian Affairs Branch.

PUBLICATIONS

During the year Water Resources Paper No. 80 dealing with the surface water supply of the Pacific Drainage in British Columbia and the Yukon Territory from October 1, 1934 to September 30, 1936, and No. 82 for the Arctic and Western Hudson Bay Drainage in Alberta, Saskatchewan, Manitoba and Western Ontario from October 1, 1935 to September 30, 1937, were published. Water Resources Paper No. 79 for Ontario and Quebec from October 1, 1935 to September 30, 1937, was in press at the end of the year. Bulletins entitled "Hydro-Electric Progress in Canada during 1941" and "Water Power Resources of Canada" were issued during the year. Similar bulletins are issued annually.

ENGINEERING AND CONSTRUCTION SERVICE

The Engineering and Construction Service acts as a general engineering unit to the various branches of the Department, and also is called upon by other Departments of the Government to undertake engineering work or act in an advisory capacity. Its work includes the organization and supervision of construction operations for the larger projects, the preparation of plans, estimates, and specifications for such activities, and such inspections, reports, technical advice, and supervision as is required on numerous smaller projects for various Government services.

In connection with wartime activities, technical officers have been loaned for temporary work, and others seconded for required periods or for the duration.

Under authority of the National War Services Regulations, 1940, and amendments thereto, the National War Services Boards throughout the country were empowered to require conscientious objectors, of military ages subject to call up, to give alternative service in work camps to be established by the Department of Mines and Resources. In accordance with this authority, steps were taken by the Engineering and Construction Service, in the spring of 1941, to establish two camps,—one in Ontario and one in Saskatchewan. Road work, in continuation of existing provincial highways, was selected as the most suitable form of labour to be undertaken.

Following the decision of the Government that certain Japanese in British Columbia should be removed from coastal areas, the Engineering and Construction Service was instructed to make preparations to establish camps for at least 2,000 Japanese, from which construction operations would be carried out, along the highway route from the vicinity of Yellowhead Pass to Blue River, B.C. During the last week in February the first lots of men were received and housed in railway bunk car units, pending completion of camp buildings. The latter work was done by these crews.

Subsequently, it was decided to open up camps along the route of the Hope-Princeton Highway and on the Trans-Canada Highway between Revelstoke and Sicamous, to accommodate Japanese workers.

By the end of March, 1942, sufficient camp accommodation had been provided on the Jasper-Blue River Highway project for some 1,700 men. Camps consist of frame bunk-houses, kitchens, dining rooms, office, storehouses, and wash-houses. A field hospital of 12 cots was established.

Architectural work performed included the preparation of plans, specifications, and estimates for buildings, and certain other structures to be undertaken

by the Department, the examination of reports and returns made in connection with construction of buildings, as well as the examination and approval or revision of plans of buildings proposed to be erected by private individuals on lands under the control of the Dominion.

A description of the more important construction and maintenance projects, undertaken by this Service in the year under review, is given hereunder:

Alternative Service Work Camps

Montreal River Camp (Ontario).—The first groups of trainees for this camp arrived in July, 1941. The total number of trainees accommodated to March 31, 1942, was 273. In addition, 47 individuals were given employment as staff and key men.

Trainees were employed on highway construction on Ontario Provincial Highway No. 17. Work of completing the existing highway consisted of cleaning out ditches, brushing and cleaning up right-of-way, trimming rock and earth slopes, widening fills, and the cutting and setting of guard rail posts. New construction north of Montreal River consisted of the usual clearing, grubbing, and excavation work. Operations continued throughout the winter. The following work was done: Tote road improvement, 1 mile; brushing, 12·65 acres; clearing, 48·88 acres; grubbing, 18·32 acres; excavation, solid rock, 14,478 cubic yards; other material, 41,391 cubic yards; guard-rail posts in place, 1,383; rip-rap, 246 cubic yards. Timber was cut for culverts, corduroy, guard-rails and camp firewood. Number of man-days worked: trainees, 30,125; keymen, 3,967.

Lac la Ronge Camp (Saskatchewan).—The first group of trainees for this camp arrived in June, and various others at later dates. The total number of trainees accommodated was 84. In addition, 37 individuals were employed in connection with staff work or as key men. The first camp was established some 120 miles north of Prince Albert, on the road to Lac la Ronge, and later moved to new locations as work progressed.

In view of the severity of the climate and type of country through which the road was being constructed, it was not considered economically feasible to continue operations during the winter months. The camp was therefore closed down on November 5, and trainees returned to their homes.

The following items of work were carried out during the season: Clearing deadfall over a distance of 25 miles; repairing low spots and washouts, 10 miles; completing sections partially graded, 5 miles; new grading, 6 miles; and clay surfacing and trimming sandy sections of earlier construction. The foregoing involved the following quantities: Clearing and grubbing, 17 acres; excavation: solid rock, 300 cubic yards; loose rock, 12,000 cubic yards; earth, 99,250 cubic yards; round logs in culverts, 9,400 linear feet; number of man-days worked: trainees, 7,775; keymen, 2,821.

HIGHWAYS

Main Tourist Highways and Entrance Highways from International Boundary

KINGSGATE-KOOTENAY PARK HIGHWAY

During the 1941 season, some 19 miles of seal-coating work were undertaken by the Province on a 50-50 basis with the Dominion, south of Cranbrook, and 9,016 linear feet of guard-rail were installed. All work under the agreements was therefore completed by the end of the 1941 season.

The following amounts have been contributed by the Dominion under the two Agreements: 1936-37, $92,877.25; 1937-38, $136,416.59; 1938-39, $174,845.14; 1939-40, $190,000; 1940-41, $96,977.08; 1941-42, $10,771.31; Total, $701,887.37.

PRINCE RUPERT-TERRACE-CEDARVALE HIGHWAY

Early in 1942 it was decided to commence the immediate construction of a highway between Prince Rupert and Cedarvale, B.C., a distance of some 137 miles, which would afford highway connection with Hazelton, B.C. The Department was charged with the responsibility of building the road.

Arrangements were made with the Government of British Columbia, whereby the latter organized location parties and placed them in the field almost immediately to start operations. Late in March, 1942, an inspection of the route of the above highway was made by an engineer of the Engineering and Construction Service, in company with representatives of the British Columbia Government, Department of National Defence, and Canadian National Railways, when the general location to be followed was considered.

TOURIST HIGHWAYS

The work during the 1941-42 season was done under an extension of an existing agreement with the Province of British Columbia, whereby certain finishing-up work was undertaken along the King George VI (Peace Arch) Highway, between the International Boundary at Blaine and New Westminster. Under the agreement, the Dominion contributed 50 per cent of the total provincial expenditures, as approved by the Dominion, up to a stated maximum.

1941-42	Maximum Dominion allotment	$7,605 50
	Payments by Dominion	7,263 07

Work Accomplished.—Work during the season consisted in shaping and oiling the shoulders along sections of the highway, which it was impossible to undertake the previous season, and minor grading, guard-rail installation, and drainage structures on the Nicomekl River to International Boundary Section.

Dominion Expenditure under the Tourist Highways Program for Construction of the King George VI (Peace Arch) Highway

1938-39	$147,436 17
1939-40	118,275 88
1940-41	85,964 40
1941-42	7,263 07
Total	$358,939 52

GANDER LAKE HIGHWAY—NEWFOUNDLAND

In accordance with a request from the Royal Canadian Air Force, two parties were organized to carry out location surveys for a motor highway in Newfoundland. Camps were established and survey operations started at the beginning of October.

Following the closing down of field work, the plotting of survey notes, designing of bridge plans, and preparation of estimates of quantities and costs were proceeded with.

ENGINEERING WORK IN NATIONAL PARKS

BANFF NATIONAL PARK

Trans-Canada Highway (Lake Louise East Section).—Under contract with a Vancouver construction company, hard-surfacing of a section of the Trans-Canada Highway, between Johnson Creek and Lake Louise Station, was undertaken. A total of 19·72 miles of bituminous mulch pavement was laid, and in addition 17 miles of seal-coating was placed during the season on this road.

Gravel shoulders were constructed along the whole newly hard-surfaced section. The Banff Park section of the Trans-Canada Highway is now hard-surfaced from the east boundary of the park to Lake Louise Station, a distance of 47 miles, with the exception of about 1,000 feet of new fill at the Pipestone River Crossing.

Bituminous mulch pavement was also laid on the half-mile of road between Lake Louise and the Trans-Canada Highway.

A new concrete and steel girder bridge of two spans was constructed over the Pipestone River, east of Lake Louise Station. The location of the river crossing was revised slightly to improve road conditions in the vicinity. This necessitated the construction of heavy fill approaches to the new bridge, as well as on the wye junctions to the Lake Louise-Jasper highway. The old timber truss spans at this crossing and at the Corral Creek crossing were dismantled.

Some 3,000 lineal feet of tile drain were placed along the foot of the cut-bank on the revised highway location through the Eldon Hill section.

A valuation survey was made of the Banff electrical distribution system in connection with its proposed sale to the Calgary Power Company.

Lake Minnewanka Power Project.—In connection with the project of the Calgary Power Company for raising the level of Lake Minnewanka and the construction of a power-house at Anthracite, an engineer of the Engineering and Construction Service acted as Departmental representative. Inspections of work in progress were made daily, or oftener if required.

Jasper National Park

Jasper to Jasper Park Lodge Road.—Under an arrangement with the Canadian National Railways, the new approach road between Jasper townsite and Jasper Park Lodge was surfaced with road mix bituminous pavement, a total of some 4 miles of road being treated. In addition, the loop drive and parking area at the Lodge was paved. The entire length between Jasper and the Lodge was seal-coated.

Athabaska River Bridge.—Early in the season a contract was let for the replacement of the 225-foot timber truss span over the Athabaska River, some 12 miles east of Jasper, by a steel truss. In order that tourist traffic should not be affected during the busy season, actual erection of the span was postponed to the autumn. On September 22, dismantling of the timber truss started, and all erection work of the steel span, including floor and painting, was completed by early December, when the bridge was opened to traffic.

An inspection was made of the 4 shorter spans of this bridge, and maintenance and necessary repairs and replacement of failing members carried out.

Fish Hatchery.—A survey was carried out of the site for the new Fish Hatchery Building and water supply line at Maligne River. Plans and specifications for the building were got out and contract let. Work started on the building in March, 1942, and by the end of the period excavation work and concrete foundations were completed.

Water Supply.—An inspection was made and report prepared in connection with conditions at the storage and reservoir basins of the Jasper water supply.

Waterton Lakes National Park

Pass Creek Bridge.—A new concrete and steel beam bridge, consisting of three 55-foot spans, was constructed over Pass Creek on the main entrance road. The new bridge was erected on a location a short distance downstream from the old crossing, and involved the revision of some 2,400 feet of the high-

way in the vicinity, with the construction of new approaches. Some 15,000 cubic yards of fill were required for the latter work. Timber crib protection work was placed along the south bank of the creek. The old timber truss structure, which the above bridge replaced, was dismantled.

Kootenay National Park

Sinclair Creek Bridge.—On the Banff-Windermere Highway, at Mile 4·2 above the junction with the Columbia Valley road, a new concrete and steel beam bridge was constructed to replace a timber truss span over Sinclair Creek. A revised location was selected for the new structure to provide for the straightening out of the approaches. All work was completed except for the finishing coat on the concrete, which was postponed in view of weather conditions. The old timber truss at this point was dismantled.

Elk Island National Park

A barn and stable were constructed under the direction of the Park Superintendent.

Cape Breton Highlands National Park

Cabot Highway.—During the season of 1941 improvement of the Cabot Highway from the east entrance of the park was undertaken for a distance of about two miles. A section of the road also was relocated in the vicinity of the golf course in view of certain changes projected for the latter. This road work involved clearing, grubbing, grading, installation of permanent culverts, ditching, and gravel surfacing.

In addition to the foregoing, a road was constructed from the Registration Building to the recreation grounds, a distance of slightly more than half a mile.

Information was obtained in connection with the proposed replacement of four trestles on the section of highway leading up North Mountain from the east.

A survey was made of the route of the power-line following the highway near the East Park Entrance.

Sketches were prepared for cabins and a combined store and restaurant building for the proposed auto bungalow camp.

A sketch was prepared for the proposed temporary golf clubhouse.

Riding Mountain National Park

Plans were prepared for a new Post Office.

An estimate of cost was prepared for the proposed Royal Canadian Mounted Police quarters.

General

Plans and bills of material were prepared for the construction of experimental sections of a prefabricated type of tower lookout cabin for forest rangers.

ENGINEERING WORK FOR INDIAN AFFAIRS

Engineering work performed by the Service for Indian Affairs Branch included studies, inspections, and improvement of irrigation, domestic water supply, lighting, and sewage disposal systems; repairs and improvements to hospital, school and agency buildings; improvement of roads; protection of river banks, and a variety of other tasks.

Work was performed on the following reserves:

British Columbia.—Penticton I.R. No. 1; Okanagan I.R. No. 1; Upper Similkameen I.R. No. 2; Okanagan I.R. No. 7; Osoyoos I.R. No. 1; Chekwelp I.R. No. 26; Sliammon Village; Burrard I.R. No. 3; Pemberton I.R. No. 1; Coqualeetza Hospital, Sardis; Kitsegukla I.R.; Alberni Residential School; Kuper Island School; Saanich I.R.'s Nos. 1, 2, 3 and 4; Lillooet I.R. No. 4; Lillooet I.R. No. 1 (Cayoosh Creek); Kamloops I.R. No. 1; Kamloops Residential School; Kootenay I.R. No. 1; Kootenay Residential School; Anaham Village; Williams Lake I.R. No. 1; Soda Creek I.R. No. 2; Port Simpson Village; Nicomen I.R. No. 1; Cook's Ferry I.R. No. 9.

Alberta.—Peigan Agency; Lesser Slave Agency; Blood Reserve; St. Cyprian Residential School.

Saskatchewan.—Muscowequan Residential School; Round Lake Residential School; St. Philip's Residential School; Carlton Agency (Leask); Big River Reserve; Gordon's Residential School; Onion Lake Reserve.

Manitoba.—Norway House Agency; Portage la Prairie Residential School; Cross Lake Residential School; Lake St. Martin Reserve.

Ontario.—Sarnia and Kettle Point Indian Reserves Nos. 44 and 45; Moravian Reserve; Garden River Reserve; Chapleau Residential School; Christian Island Agency; McIntosh Residential School; Moose Factory Agency; Kenora Agency; Six Nations Reserve.

Quebec.—Pointe Bleue Agency; Lorette Village; Restigouche Reserve; Caughnawaga Reserve; St. Regis Agency.

GEODETIC SERVICE OF CANADA

The field work carried on in the year 1941-42 was almost entirely for the immediate use of the Department of National Defence. Special publications of this Service were sent out in response to an increased number of requests. Many of them were used to furnish control data in the revision of charts and maps, and others were required in the compilation of aerial navigation maps. Publications on geodesy and geodetic methods were sent to scientists in England in response to a request made through the Office of the Canadian High Commissioner in London.

Two publications were printed and are to be distributed by means of a mailing list of carefully selected names.

Primary triangulation was extended along the north shore of the Gulf of St. Lawrence. Special levelling was carried on in the Maritime Provinces. Two nets of secondary triangulation were completed on the British Columbia coast. Observations of the astronomical latitudes and longitudes of a number of geodetic survey stations in Ontario and Quebec were made in connection with the "Deflection of the Vertical".

The transfer of triangulation data to the 1927 North American datum was continued. Special work was completed for a number of scientific investigations required for defence purposes. Geodetic results of Canadian triangulation in Newfoundland, Alberta, and British Columbia were furnished in compliance with a request from the U.S. Army Engineering Service.

TRIANGULATION

Gulf of St. Lawrence.—Primary triangulation was continued in 1941, along the north shore of the Gulf of St. Lawrence. Observations for angle measurement were commenced near Havre St. Pierre and were carried eastward to a

point just east of Kegashka. Twenty stations were occupied, and the progress for the season was 80 miles. Stations were prepared for observing further east.

The most difficult section of the coast net, on account of the problem of transportation to inland stations, has now been completed.

Halifax, N.S.—Secondary triangulation and precise levelling were carried out in the defence area of the Halifax district for the Department of National Defence as a basis for an investigation into coefficients of refraction.

The services of the Triangulation Adjustments Division were utilized in the design of methods leading to rapid calculation of ranges subject to specified variations in the sighting of instruments and the electrical transmission of the results in connection with Coast Defence.

Saint John, N.B.—Secondary triangulation and precise levelling was also carried out in the defence zone of the Saint John area for the Department of National Defence.

British Columbia Coast.—Two fairly extensive secondary triangulation nets were completed in Queen Charlotte Sound and other areas between the northern end of Vancouver Island and the mainland. In general their purpose was to secure additional stations close to the shore to provide control in the charting of important deep inlets in this district.

LEVELLING

Special levelling for the Department of National Defence was undertaken in three areas in the Maritime Provinces, the work in each case involving the carrying of the levels across bodies of water by the method of simultaneous reciprocal readings.

Saint John, N.B.—Levels were carried down the east shore of Courtenay Bay and also across the harbour to Fort Dufferin. Five standard bench marks were established and connections to a number of existing bench marks and other points were made.

Halifax, N.S.—Levels were carried from the previously established bench marks in the city to Ketch Harbour and also across the narrows between Halifax and Dartmouth; thence along the east shore of the harbour to McNab Island, the village of Eastern Passage, and beyond. Twenty-two standard bench marks were established and, as in the case of Saint John, connections were made to existing bench marks and other points, and to geodetic triangulation stations. One of the new bench marks, No. 1180-B, was established in the Naval Dockyard to replace the original Admiralty bench mark upon which all tidal records and precise levelling in the vicinity are based.

Mulgrave-Point Tupper, N.S.—No new bench marks were established at these points but the levels were transferred across the Strait of Canso by the method of simultaneous reciprocal readings between the bench marks at Mulgrave station and Point Tupper station, to ensure the accuracy of the datum used on Cape Breton Island.

The net result of the season's operations was to add some 60 miles of precise levelling and 27 bench marks to the system of levels.

Two publications dealing with levelling information were issued during the year. Publication No. 45, " Altitudes in Northern Ontario ", covers that portion of the province lying northwest of North Bay. Publication No. 46, " Altitudes in Manitoba ", has also been printed. Considerable work was done during the year on the compilation of the manuscript " Altitudes in Alberta ".

GEODETIC ASTRONOMY AND ISOSTASY

Geodetic Astronomy

The field work in connection with the "Deflection of the Vertical" investigation was continued during 1941. Observations of the astronomical latitudes and longitudes were made at fifteen geodetic survey stations in the Ontario and Quebec triangulation nets. These stations are Maniwaki and Fort Coulonge in Quebec, and Plantagenet, Navan, Ashton, Crosby, Somerville, Logan, West Tweed, Belmont S.W., Sutton (E.B.), King, Orangeville, Townsend and Rymal in Ontario. In addition ties were secured between the geodetic stations at Woodstock, Guelph, and Harriston in Ontario and astronomical stations observed in 1903 and 1904, thus securing the values of the "Deflection of the Vertical" at these three places.

Isostasy

This isostatic investigation into the shape of the geoid and the probable depth of compensation has been continued. When the additional data furnished from the field observations of 1941, and that to come from the 1942 work are incorporated into the investigation there will be materials available to give a rather complete picture of the isostatic conditions underlying the large section of Canada between the Atlantic Coast and the western part of Ontario.

GEODETIC RESEARCH

During the past year, the chief subject of investigation was that pertaining to long lines on the surface of the earth. A careful study based upon purely spherical considerations was first made of the indirect solution of long lines which revealed the fact that results of considerable accuracy might be obtained by this means. The study was then considered from the much more difficult standpoint of the spheroid upon which all precise calculations are necessarily made.

TRIANGULATION ADJUSTMENTS

This Division has steadily advanced the transformation of the triangulation data in Eastern Canada from the North American datum to that of the 1927 North American datum. The necessity of this has been brought about through a revision of the United States triangulation upon the new basis, which in turn has assigned more accurate values to the basic points at or near the International Boundary to which the Canadian work is attached.

In response to requests, control data has been furnished in increasing volume over last year to various organizations of the Dominion, Provincial, and Newfoundland Governments. In addition the entire results of our triangulation data in Newfoundland, British Columbia, and Alberta have been prepared and forwarded to the U.S. Army Engineering Service in Washington and in part to its organization in Seattle. Many of the larger requests dealing with the revision of existing charts and maps, and for the proposed aerial surveys for Eastern Canada, have been handled through the existing publications.

PRECISE LEVELLING ADJUSTMENT

No new precise levelling was undertaken during the past year. Adjustment "E", which comprises all the precise levelling up to and including, as at the end of 1941, has been completed and final values of all points in the Canadian Level Net have been computed and tabulated.

A small mimeographed booklet is being prepared showing comparative values with five other adjustments made during the period from 1928 to 1941 inclusive.

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, February 18 to 21, 1941, at which they discussed and agreed on details of the field work planned for the 1941 summer season. The United States Commissioner was accompanied by Mr. Hill, Engineer to the United States section of the Commission.

Inspections

The Commissioners met at Beamsville, Ontario, on August 20 and the same day went on to inspect the work being done on the Niagara River. From here they went to Detroit to consult with the United States Corps of Engineers who were engaged in dredging operations to improve navigation in the St. Clair River. Some of the boundary reference monuments along the river lie within the proposed dredging area and arrangements were made with the Engineer officials to reference and protect the monuments so that they could be recovered with a minimum of labour. All costs were to be borne by the Corps of Engineers. The Commissioners then proceeded to inspect the work of the maintenance parties on the 45th Parallel between Quebec and Vermont and on the Southwest Line between Quebec and Maine. They returned to their headquarters on September 5.

The Engineers to the United States and Canadian sections of the Commission made a joint inspection of the important highway crossings of the 49th Parallel from the Lake of the Woods to the Rocky Mountains. This was to investigate the need of erecting prominent ornamental monuments at these crossings depending on the volume of traffic across the border. It was recommended that eight pairs of such monuments be erected.

Maintenance of the Boundary

A party from the Canadian section of the Commission carried on maintenance operations along the Southwest Line between Quebec and Maine. Starting from Lac Frontiere in Quebec the party worked to the northeast, clearing the vista and inspecting and repairing the monuments as far as Monument 202 at Morrison Brook where the work had stopped in 1939. On this section a distance of 48 miles of line was covered, 82 monuments were inspected and repairs made to 13 of them.

The party returned to Lac Frontiere early in September and continued the same operations to the southwest as far as Monument 309 on the Southwest Branch of the St. John River. On this section a distance of 19 miles of line was covered, 35 monuments were inspected, and repairs made to 2 of them.

A second Canadian party was engaged on maintenance work along the 45th Parallel on the section of the boundary between Quebec and the States of New York and Vermont. The party started work at Monument 774 near Dundee, Quebec, on May 19 and finished at Monument 593 near Frelighsburg, Quebec, on September 20, a total distance of 104 miles. In this distance 241 monuments and 39 bench marks were inspected, 22 monuments repaired and 80 miles of vista recleared.

An engineer from the Canadian section of the Commission again acted as attaché on a United States party working on the Niagara River. This work forms part of a larger program, which has been undertaken by the Commission, along the water boundary through the Great Lakes and connecting rivers south

of the Province of Ontario. The old triangulation stations of the International Waterways Commission and the United States Lake Survey are being recovered and incorporated into a continuous triangulation net, connected with the Canadian Geodetic Survey, so that all the boundary reference monuments may be placed on the North American Datum of 1927.

This year a triangulation net was completed along the full length of the Niagara River. About one-third (41 out of 129) of the old stations were recovered, re-marked, and described. The final adjustment of this net and of a similar one, previously completed along the St. Lawrence River, is being made by the United States Coast and Geodetic Survey.

The intersection of the boundary line with the new Rainbow Bridge over the Niagara River was determined and marked on the bridge by two bronze tablets.

Lights on Range Marks in Boundary Bay

Through the co-operation of the Department of Transport, lights were installed on the range marks on the boundary across Boundary Bay on the Pacific Coast.

Reports

The Canadian and United States sections alternate in getting out the Annual Joint Report of the Commission, required under the treaty of 1925. This year the report for 1940 was prepared by the Canadian section. Further progress was made too in the preparation of material for the joint report on the survey and demarcation of the section of the International Boundary from Cape Muzon to Mount St. Elias.

HYDROGRAPHIC AND MAP SERVICE

HYDROGRAPHIC SERVICE

During the year the work of the Hydrographic Service was an important factor in naval, mercantile, and air operations. By undertaking detailed charting of strategic areas, the Service lent assistance to the planning and installing of vital coastal and harbour defences in Canada and Newfoundland. Through the production of strategic charts for use at Naval and Air Force headquarters, aid was given in the carrying out of important fleet and convoy movements. By supplying nautical charts, volumes of Pilots and Sailing Directions and the official Tide Tables, the Service provided the primary navigational aids to the Navy and Merchant Marine. The number of these and other demands surpassed all previous records.

The administration of the various Divisions comprising the Hydrographic Service was conducted from Hydrographic Headquarters, Ottawa, which also served as a clearing centre for general navigational information. The District Hydrographic Office at Victoria facilitated charting and tidal operations on the Pacific Coast and served as a distributing centre for hydrographic publications pertaining to that seaboard. This geographic organization of the Hydrographic Service permitted closest contact with the chart requirements of the Naval Establishments on both coasts and at Naval Headquarters, Ottawa.

Detailed charting for war purposes was required in widely separated parts of the Atlantic and Pacific seaboards of Canada and in Newfoundland waters. In order to expedite emergency hydrographic work in the various strategic areas, it was necessary to organize the different charting units with special regard to flexibility of movement of personnel and equipment. On the Pacific Coast,

this was facilitated by the use of the hydrographic vessel *Wm. J. Stewart* and auxiliary craft. In Newfoundland, charting operations were carried on with the use of the Department of Transport vessel *N. B. McLean.* The Hydrographic vessels *Cartier* and *Acadia* were still on loan to the Navy and without their use it was necessary to conduct the work on the Canadian Atlantic Coast and Gulf of St. Lawrence with only small motor launches.

The development of coastal defences on the Atlantic and Pacific Coasts of Canada and Newfoundland require accurate knowledge of the tides and currents. Special tidal studies and investigations were conducted by the Tidal and Current Division, the results being made available in concise form. The Precise Water Levels Division continued the systematic recording of the fluctuating water surface elevations of the St. Lawrence-Great Lakes Waterway, the tabulated data being required by mercantile, power, and other interests.

Exchange of Hydrographic Data.—As in past years, several other Government Departments participated in the exchange of information pertaining to the navigation of Canadian waters. In particular, a great deal of very important material affecting nautical charts and volumes of Pilots and Sailing Directions was received from the Naval Service. The Departments of Transport and Public Works also supplied considerable data relating to aids to navigation and in connection with channel and harbour improvements. Reciprocating, the Hydrographic Service furnished these Departments with standard nautical publications such as Charts, Sailing Directions, Tide Tables, and Water Level Bulletins. The Hydrographic Service also reported on the finding of uncharted rocks or other dangers to navigation and informed maritime interests regarding chart corrections and the issuance of new charts. This was done through the medium of the official Notices to Mariners, published by the Department of Transport.

Many new charts and publications were received from the British Admiralty Hydrographic Department, the United States Hydrographic Office, the United States Lake Survey Office at Detroit, and the International Hydrographic Bureau of Monaco. A large proportion of Canadian coastal waters are covered only by original Admiralty charts, and in order to keep these corrected to date, information was supplied from time to time to the Admiralty. The established contact with the Admiralty and with the United States Hydrographic Office has been found to be of great value during the War.

Pilots and Sailing Directions.—The volumes of Pilots and Sailing Directions published by this Service cover a great part of the coastal and inland navigable waters of the Dominion.

During the year the following publications were completed: Nova Scotia (S.E. Coast) and Bay of Fundy Pilot (1st Edn.), Gulf of St. Lawrence Pilot (2nd Edn.), British Columbia Pilot (Vol. 1, 3rd Edn.).

Hydrography

To the full extent of facilities available, the established plan of systematic coastal charting was continued on both the Atlantic and Pacific seaboards. Priority was given to the charting for specific war purposes required by Canadian and British Naval authorities and by the R.C.A.F. Where possible, these special hydrographic surveys were incorporated into the regular scheme of coastal charting. As a result, a number of important standard navigation charts were issued, or older editions were brought up to date.

Atlantic Coast and Inland Waters

Atlantic Coast-Bay of Fundy.—This unit, equipped with a fleet of small motor craft, conducted a number of detailed hydrographic surveys on the south-

east coast of Nova Scotia and in the Bay of Fundy. The work was all required in connection with wartime shipping.

The survey of Lahave River, Nova Scotia, commenced on May 21 and the portion, Conquerall Bank to Bridgewater, was completed on August 8. From this date until November 25 was devoted to the charting of the lower part of the river from Mosher Island to Conquerall Bank. From May 8 to July 21, a detached party carried on a large scale survey of Alma, New Brunswick, and its approaches and, following this, the charting of Apple River, Nova Scotia, was taken in hand and completed on September 24. The final work of the season was at Parrsboro, Nova Scotia, where another harbour survey was carried out from September 29 to November 21. The boats belonging to this unit were then laid up for the winter but before terminating the season's field operations, the charts of Halifax Harbour were carefully checked for incorporation of important changes.

As a result of the season's work the following charts will be available: "Lahave River, Riverport to Conquerall Bank"; "Lahave River, West Ironbound Island to Riverport"; "Alma, N.B., and Approaches"; "Apple River, N.S., and Approaches"; "Parrsboro and Approaches".

Summary of Season's Work

Boat sounding	996	linear miles
Coastlining	144	" "
Shoals examined	52	

Gulf of St. Lawrence-Cape Breton.—The fitting out of the launches commenced at Charlottetown on April 15. With Port Daniel, Bay of Chaleur, as a main base of operations, the detailed charting of seven small harbours along the Gaspe Peninsula was carried on. This part of the season's work was requested by the Ministry of War Transport of the United Kingdom and was completed on August 17.

For the assistance of vessels engaged in the bunker trade, special charting in the Little Bras d'Or, Cape Breton, was then taken in hand, the boats making the trip to this place under their own power.

On June 8, while the above work was in progress, a main section of this hydrographic unit proceeded to Newfoundland to undertake special strategic charting operations requested by the British Admiralty. On September 16 the party returned from Newfoundland, and both sections of this hydrographic unit joined in carrying out detailed charting of South Arm, Sydney Harbour, at the request of the Ministry of War Transport. On November 1 the season's work terminated and the boats proceeded to Charlottetown for wintering.

As a result of the season's work the following charts will be published: "Cap Chat and Approaches"; "Mechins and Approaches"; "Barachois and Mal Bay Harbours"; "Port Daniel"; "Chandler and Approaches"; "Grand River and Approaches"; "Little Bras d'Or"; "Sydney Harbour (South Arm)"; "Mortier Bay, Nfld."; "St. John's Harbour, Nfld.".

Summary of Season's Work

Boat sounding	628	linear miles
Coastlining	74	" "
Shoals examined	110	

St. Lawrence River.—The hydrographic launch *Boulton* again outfitted at Prescott, and on May 17 proceeded to Lake St. Peter to conduct a modern hydrographic survey of that lake as part of the general scheme of recharting the St. Lawrence River from Quebec to Montreal. Assistance was given by the Geodetic Service in tying the hydrographic control triangulation into the geodetic net.

During the season it was found necessary to transfer three hydrographers from this unit to assist in war charting elsewhere, but good progress was made by the small party left to carry on the work. The season's operations terminated on October 15 with two-thirds of the charting completed.

Summary of Season's Work

Boat sounding	409 linear miles
Coastlining	41 " "
Shoals examined	7

PACIFIC COAST

Main charting operations were again conducted by the hydrographic vessel *Wm. J. Stewart* and the houseboat *Pender*. A number of emergency surveys required by the defence forces were also carried on directly from the Victoria headquarters.

The C.G.S. *Wm. J. Stewart* commissioned at Victoria on May 1 and sailed the following day with the houseboat *Pender* in tow. On May 3 the latter craft was anchored in Blind Creek, Cortes Island, in order to carry on charting operations in the vicinity. From May 5 to 31 the ship conducted a hydrographic survey of the area, Sutil Channel to Desolation Sound, including Malaspina Inlet. The houseboat was then transferred north to Klik-tso-atli Harbour, near Bella Bella. During the period from June 5 to July 23, the *Wm. J. Stewart* carried on detailed charting operations in the area, Spider Island to the south shore of Calvert Island. The sounding and examining of Klik-tso-atli was completed and the ship then proceeded to the west coast of Vancouver Island where, until August 8, large scale hydrographic surveys were made at Stephens Bay and Ucluelet. The rest of the month was occupied in hydrographic work in the northern entrance to Queen Charlotte Strait.

Following this, until September 12, charting operations were carried out at Section Cove and Alliford Bay in Queen Charlotte Islands. The ship then returned to the mainland and conducted a large scale survey of Seal Cove, Prince Rupert Harbour. Sounding was also carried out on the west side of Base Sand, northwest of Kennedy Island. From the latter date, until October 4, hydrographic operations were conducted in Kwakshua Channel, west coast of Calvert Island, Klik-tso-atli Harbour, Bate Passage, Nigei Island, and at the entrance to Topaze Harbour. From October 6 to 18, charting operations were completed in the Sutil Channel-Desolation Sound area in the Strait of Georgia. The ship, with the houseboat *Pender* in tow, arrived at Victoria on October 19 for laying up.

In order to meet possible exigencies arising from the war on the Pacific, arrangements were later made to keep the *Wm. J. Stewart* in readiness. She was, therefore, recommissioned on January 2, 1942.

The results of the hydrographic work conducted during the season will be incorporated in a number of new standard navigation charts and also some special plans for the use of the Defence Forces.

Summary of Season's Work

Coastlining	1,341 linear miles
Boat sounding	147 " "
Ship sounding	415 " "
Shoals examined	428

Hydrographic Houseboat Pender.—As indicated above, this auxiliary craft was used as a supplementary base from which to carry on charting operations in various localities. During the first part of the season the craft was used in hydrographic work in the vicinity of Cortes Island in the northern part of the Strait of Georgia. Following this, the triangulation and coastlining of Klik-tso-atli Harbour was undertaken. In the period from July 4 to July 30, the *Pender*

was occupied in the detailed charting of portions of Langley Passage, Estevan Island, and later in the season was required for important hydrographic operations in Esquimalt Harbour.

Precise Water Levels

The St. Lawrence-Great Lakes Waterway, which constitutes a main physical feature of the continent, greatly affects the economic life of Canada. The rises and falls of its waters are particularly vital to navigation, water power, and municipal interests.

During the year, from the 529 months continuous recordings in the field, over 600,000 water surface elevations were computed, collated, and compiled into comprehensive tabulations. A total of some 22,000 sheets of bulletins, profiles, etc., were issued during the year. Twelve monthly, 5 annual, 6 general data, and 5 graphic bulletins were also issued.

Many requests were received for information relative to specific problems in which water levels were the main factor. In most cases, special analyses, tabulations, and deductions were required.

TIDES AND CURRENTS

Work of the Tidal and Current Division includes the obtaining, study, and dissemination of data pertaining to the tides, the prediction of tides and tidal currents, and the determination of low-water datum planes for navigation charts and engineering purposes. New information for the refinement or the extension of existing tidal data is continually being studied and tabulated. Tidal information is published in the form of standard Tide Tables.

During the early part of the fiscal year the preparation of the various editions of the Tide Tables for 1942 was completed and the manuscripts forwarded to the printer. Work on the 1943 editions was advanced. Two complete editions, 1 for the Atlantic Coast and 1 for the Pacific Coast, are published for shipping interests generally. Besides these, there are 6 abridged pocket editions to serve the needs of fishermen and others locally—4 cover various localities on the east coast and 2 on the west coast. The publications are classified as follows:—

Atlantic Coast Tide Tables.—"Tide Tables for the Atlantic Coast of Canada", complete edition. There are also 4 abridged editions entitled "Quebec and Father Point"; "Charlottetown and Strait of Canso"; "Halifax and Sydney"; "Saint John and Bay of Fundy".

Pacific Coast Tide Tables.—"Tide Tables for the Pacific Coast of Canada", complete edition. There are also abridged editions entitled "Vancouver and Sand Heads" and "Prince Rupert and Northern British Columbia".

Publications on Currents and Tidal Streams for the assistance of navigation are as follows: "Tables of Direction and Velocity of Currents in the Bay of Fundy and its Approaches"; "The Currents in the Gulf of St. Lawrence"; "The Currents in the Entrance to the St. Lawrence" (Gaspe region); "The Currents in the St. Lawrence Estuary, Ste. Anne des Monts to Father Point", and "Tidal Current Charts for Hourly Stage of the Tide, Orleans Island to Father Point".

Other publications not bearing definitely on navigation are "Tide Levels and Datum Planes, Atlantic Coast"; "Tide Levels and Datum Planes, Pacific Coast"; "Tide at the Head of the Bay of Fundy", and "Tides and Tidal Streams", a descriptive booklet by Dr. W. Bell Dawson, the former Superintendent of the Tidal Survey.

The principal tidal stations maintained in operation are:—

Atlantic Coast.—Quebec, Father Point, and Harrington, P.Q.; Charlottetown, P.E.I.; Saint John, N.B.; Halifax, N.S.; Churchill, Man.

Pacific Coast.—Vancouver, Victoria, Clayoquot, and Prince Rupert, B.C.

Investigation of Currents and Tidal Streams.—At the request of local Harbour authorities, the detailed charting of the strong river currents in Montreal Harbour was carried out from May 14 to May 30 by hydrographers of this Service, with the assistance of the St. Lawrence Ship Channel. The publication of a special chart showing speeds and directions of the complicated currents will result from the work.

Information Service.—Tidal data were furnished to navigational interests, engineers, legal services, and others. Information was also supplied other Government Departments, especially to the Department of National Defence for special needs. Tidal predictions for a number of our ports were supplied the Admiralty and the United States Government Departments.

CHART CONSTRUCTION

Owing largely to war demands there has been a steady increase from year to year in the number of new editions prepared and printed. Figures for the past three years are as follows:—

Charts printed, 1939-40, 72; 1940-41, 105; 1941-42, 174.

Large quantities of Canadian charts were supplied to the Naval Chart Depots and a number of reproductions were made of certain Admiralty charts on very short notice. Special charts to meet emergent requirements were designed and supplied to the Naval Intelligence Service. The year's output consisted of the following: 54 charts published in colours; 77 charts published in black only, including 36 reprints of Admiralty charts; 17 special wall maps for the Defence Headquarters, and 5 process prints; 21 patches for chart correction.

In previous Annual Reports it has been customary to insert here a list of nautical charts published during the year. As a matter of war economy it is being deleted in this year's report, but if mariners or other interested persons desire to secure the information, it can be obtained on application to the Surveyor-General and Chief, Hydrographic Service, Department of Mines and Resources, Confederation Building, Ottawa.

Distribution of Nautical Publications

As indicated by the following record of chart distribution, there was no abatement in the increasing annual demand noted for several years in the Annual Reports: 1933, 8,470; 1934, 9,236; 1935, 10,228; 1936, 12,883; 1937, 14,006; 1938, 17,999; 1939, 19,850; 1940, 33,136; 1941, 47,699.

Nautical publications distributed during the year were as follows:—

Catalogue of Charts, Sailing Directions, and Tidal Information with Index Maps	979
Navigational Charts	47,699
Pilots and Sailing Directions	1,345
Tide Tables	39,623
Water-levels Bulletins, Graphs	22,000

MAP SERVICE

The Map Service includes the Legal Surveys and Map Service. Its chief functions are the complete preparation and distribution of a wide variety of maps across the Dominion, the making of legal surveys under the direction of the Surveyor General, and the photographing and printing of hydrographic charts.

Throughout the year the continued unprecedented demand for maps has kept the whole staff hard pressed to meet the requirements, notwithstanding that many things have been done to speed up the work, and that the whole concentration has been upon war work.

During the year the eight-mile to one-inch air navigation series in Canada was expanded to 58 sheets printed and 14 sheets in course of preparation; for air training purposes certain of Great Britain's air navigation charts, target maps, and plotting series charts were reproduced and printed, and a series of plotting charts of North America for operational purposes has been commenced. Reprints and revisions were necessarily confined to maps required in the war effort.

Close co-operation with the United States in certain mapping projects was established and is being maintained. In this connection astronomical observations for latitude and longitude to control mapping along the recently established Edmonton-Whitehorse Airway were made by two observing parties.

The number of maps distributed by this Service has increased by about 100 per cent. The major part of the distribution was to the Royal Canadian Air Force. Other distribution netted a revenue of about $34,000.

In order to cope with the large increase in the number of maps to be handled, shelving accommodation for over 1,000,000 maps was erected in a fireproof vault; storage for paper stocks was secured in a separate building in Ottawa.

Legal Surveys

This Division acts as a central surveys organization for the carrying out of legal surveys required by various Departments of the Government. Many of the records made under the Dominion lands system and the survey records in connection with the Indian reserves, national parks, mineral claims, settlement lots on Dominion lands, and in connection with ordnance lands, aviation fields, and penitentiaries are on record in this office.

Many inquiries concerning surveys in the Provinces of Manitoba, Saskatchewan, and Alberta, relating to township plans, roads, settlement lots, and mining claims are received from the provincial governments as well as from private individuals. This division is co-operating in so far as possible with these and all the other provinces in the exchange of survey information and all other information considered useful in the compilation of modern maps.

During the year surveys were made for the Lands, Parks and Forests Branch, the Department of Justice, the National Research Council, Indian Affairs Branch, and National Defence Department.

Valuations were made of several parcels of land in connection with land sales, roads, and expropriations.

Expenditure on field surveys has been reduced to a minimum to conserve labour and finances.

Mapping Division

Map Compilation.—During the year the demands of the Royal Canadian Air Force for air navigation charts and maps of various kinds increased in number and urgency to such an extent as to practically monopolize the entire energies of this division. Charts and maps were required for all training purposes of the British Commonwealth Air Training Plan as well as for defence patrols of the coasts, convoy work, and other operational flights of the Royal Canadian Air Force. Air navigation charts for civil aviation purposes also had to be prepared and revised.

The standard air navigation chart in Canada is on a scale of eight miles to one inch. It consists essentially of a topographic base map with an overprint in red showing the special information necessary to the air pilot.

Fifty-eight charts of the air navigation series have now been printed across Canada and Newfoundland. Some of these overlap, but excluding the area of overlap, the printed charts of this series cover approximately 1,343,000 square miles. Fourteen additional sheets, 9 of which are compiled, are in course of preparation.

All the above charts are made to specifications specially drawn up to suit Canadian conditions. They differ very appreciably from those in use by the Royal Air Force. In order to assist in training pilots for overseas service, 2 charts designed to the specifications of the latter have been prepared and issued, 1 covering a training area in Eastern Canada and 1 in Western Canada. Two others, 1 covering an area of the eastern seaboard and the other a mountainous area in Western Canada are in preparation.

The need for air navigation charts on the 16-miles to one-inch scale, which was commented on in last year's annual report, is becoming more pressing. Some study has been given to this problem and it is expected that a start will be made soon on maps of this series.

In the last annual report it was stated that a series of plotting sheets on Mercator's projection at a mean scale of 1:1,000,000 had been prepared by the Geographical Section of the Department of National Defence. The Royal Canadian Air Force has requested that this series be extended to cover the east and west coasts and also that in co-operation with the United States authorities, several charts covering United States territory be compiled and printed. During the past year 13 charts were put in hand, of which the compilation of about half has been completed.

Two other new maps of the National Topographic Series were issued; the Sumas sheet, No. 92 G/1, scale one-mile to one-inch and the Thessalon sheet No. 41 J/S.W., scale two-miles to one-inch. Both of these had been in hand before the war but they had to give way to other work. Similar remarks apply to the Chicoutimi sheet, scale two-miles to one-inch. Work on this sheet was also well advanced before the war but had to be discontinued. It is now required by the Department of National Defence for defence purposes and is being completed so that it can be handed over to the Geographical Section of that department for printing.

Besides the above, reprints became necessary for 19 maps, the stock of which had become exhausted. Before reprinting they were examined to see what changes and additions would be necessary to bring them up to date, but only such work was done as could be effected without interfering with the war work.

A map of Southampton Island was prepared based upon the work of the British Canadian Arctic Expedition under Mr. T. H. Manning. This entailed co-operation with Mr. Manning in the reduction of astronomical observations and in drafting his completed map of the island. He has generously made available to the Branch the results of his explorations during the period 1934-40, extending over Southampton Island and parts of Melville Peninsula and Baffin Island. These explorations make a very valuable addition to the scanty knowledge of these areas and it is regretted that pressure of war work has so far prevented full use being made of them.

In co-operation with the United States authorities much information was collected and compiled for their use in connection with the preparation of their air navigation charts along the International Boundary and their regional charts covering large areas of Northern Canada. On Canada's part the Branch has had

occasion to request information from them and grateful acknowledgment is made of the very prompt attention which they have always given to its requests.

Field Work.—During the year the inauguration of work on the new Alaska airway made necessary the preparation of detailed maps of the little known country between Fort Nelson and Whitehorse. This Service compiled all available control and issued a preliminary air navigation map of the area, which embraced all available information.

Working in co-operation with the United States authorities it was decided that this Service would supplement the existing control with 9 astronomical observations in order to provide adequate control for air photographs to be taken by the U.S. Army Air Corps. Arrangements were only completed late in the season and it was difficult at that time to provide experienced observers and proper instrumental equipment. However, these problems were overcome and the observations were successfully taken, the last being completed on October 20 when flying conditions were already becoming hazardous. The observations were computed and the results supplied to the United States authorities in good time. The preparation of a detailed map based upon the above work will be put in hand as soon as the air photographs have been plotted.

Magnetic Work.—The work of preparing a new magnetic map of Canada was carried on intermittently as pressure of more urgent work permitted; the compilation has been completed and the printed map will be available early in the summer. The necessary magnetic information was prepared for all air navigation charts, hydrographic charts, and topographic maps produced by this and the Hydrographic Services and similar information was supplied, on request, to other Government mapping organizations. A large number of requests for magnetic information were received from Provincial Government offices, surveyors in private practice, and the general public. Co-operation was maintained with branches of the Federal and Provincial Governments actively engaged in field survey operations and the needles of 11 surveying instruments of other branches, as well as those of the Branch, were standardized against the standard instrument, which is itself standardized every year by the Dominion Observatory. The results of field magnetic observations taken during the year with these instruments were supplied to this Service and incorporated in the records of over 36,000 magnetic declination observations.

Electoral District Maps.—The taking of the Eighth Census of Canada and the creation of new Government Boards and Commissions during the year created a new demand for electoral district maps for administrative purposes.

The usual work was done in keeping up-to-date as regards parish, municipality, and county boundaries, the base maps necessary for the next re-distribution.

Miscellaneous.—Considerable control survey information was prepared and supplied to other Federal and Provincial offices and to private firms. This necessitated consulting and interpreting the records of the original surveys and the preparation of information based on them.

The Astronomical Field Tables were computed and issued as usual. Many official distances were computed and supplied to the Post Office Department, to be used by them as a basis for air mail contracts. Work of a secret nature was done for the Naval Service, entailing computing, draughting, and printing. Numerous requests were received from other branches for the loan of surveying equipment and these were complied with wherever possible.

Survey Records and Distribution

Survey Records.—This Division has charge of the registration and recording of all survey notes and plans affecting Dominion lands and Interprovincial boundaries; the supplying of information relating to these records, and the storing and distribution of the official plans of townships, townsites, and settlements. Up to the end of the fiscal year 22,225 books of survey notes and 39,840 plans had been placed on record. During the year 580 technical requests were dealt with and 6,373 official plans were distributed.

Distribution of Maps and Publications.—This Division now distributes not only all the publications, the topographical and geographical maps, and the special air navigation charts 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 maps issued by the Geographic Section, Department of National Defence, except the special military maps which are not available to the public. At the present time there are about 1,400 different maps available for distribution.

In the fiscal year ended March 31, 1942, 257,101 maps were distributed, this being the largest distribution figure ever reached in any one year up to that date.

During the fiscal year ended March 31, 1941, the number of maps distributed reached the tremendous figure of 568,256 and there were 3,131 publications distributed as well. In carrying out this work 20,502 letters and requests were dealt with.

The reason for this great increase is the ever-growing demand for maps by the various war departments of the Government and by other organizations connected with the war effort.

Since the time the Canada-United States Defence Board was set up maps have been supplied the United States in connection with the war effort. Since, however, the United States has entered the war, this demand has tremendously increased and the Department is now supplying the United States Army, Navy, and Air Corps with large quantities of air navigation charts and other maps. Other organizations such as the United States Coast and Geodetic Survey and the Bureau of Economic Warfare also request maps in connection with their war work.

In addition to the air navigation charts issued during the year nearly 80 special charts and maps required by the Royal Canadian Air Force were issued.

Map Publication

Under this heading are the Draughting, Photo-Mechanical, and Lithographic Divisions. They make finished drawings, photograph them to the printing scales, and prepare the printing plates, print the maps, and perform other related and miscellaneous tasks. Of the hydrographic charts, the photography and printing only are done.

During the year 64 new maps consisting of 20 air navigation charts and 44 other miscellaneous maps and charts were drawn, photographed and printed to a total of 191,705 copies. Forty-two air navigation chart bases and 19 other maps were reprinted. A number of these were corrected, necessitating the preparation of new drawings and printing plates; 467,951 copies were printed.

Sixty-two reproductions of European air navigation charts, plotting charts, and target maps were made. The copy supplied for the air navigation charts consisted of black lithographs of each colour to be printed, the number of colours varying from 6 to 9. The printing plates for 1 other map in this

series have been prepared. The copy for the target maps were multicoloured lithographs and these presented some difficulties to the photographer and the lithographer; the plotting charts are in black only. The total number of copies printed of these reproductions was 161,069.

For the Hydrographic Service 131 hydrographic and miscellaneous charts and tables were printed to a total of 94,945 copies.

New maps printed	64	Total copies	191,705
New township plans printed	24	" "	5,620
Maps reproduced	62	" "	161,069
Maps reprinted	61	" "	467,951
Hydrographic charts and miscellaneous	131	" "	94,945
Total	342		921,290

For the overprinting of aeronautical data on the air navigation charts 118 drawings were made or revised, photographed, and printed on 345,978 copies. Four other overprinting plates were added to 2,475 copies. For "aircraft detection" 14 printing plates were made and overprinted on 835 copies of maps in the Chief Geographer's series. These are in addition to the regular air grid edition issued for each air navigation chart.

While most of the work was in connection with air navigation charts, work was also done for other branches of the Department as well as for other Federal Departments. The printing of these maps necessitated approximately 4,858,000 impressions, as most of the maps were printed in several colours.

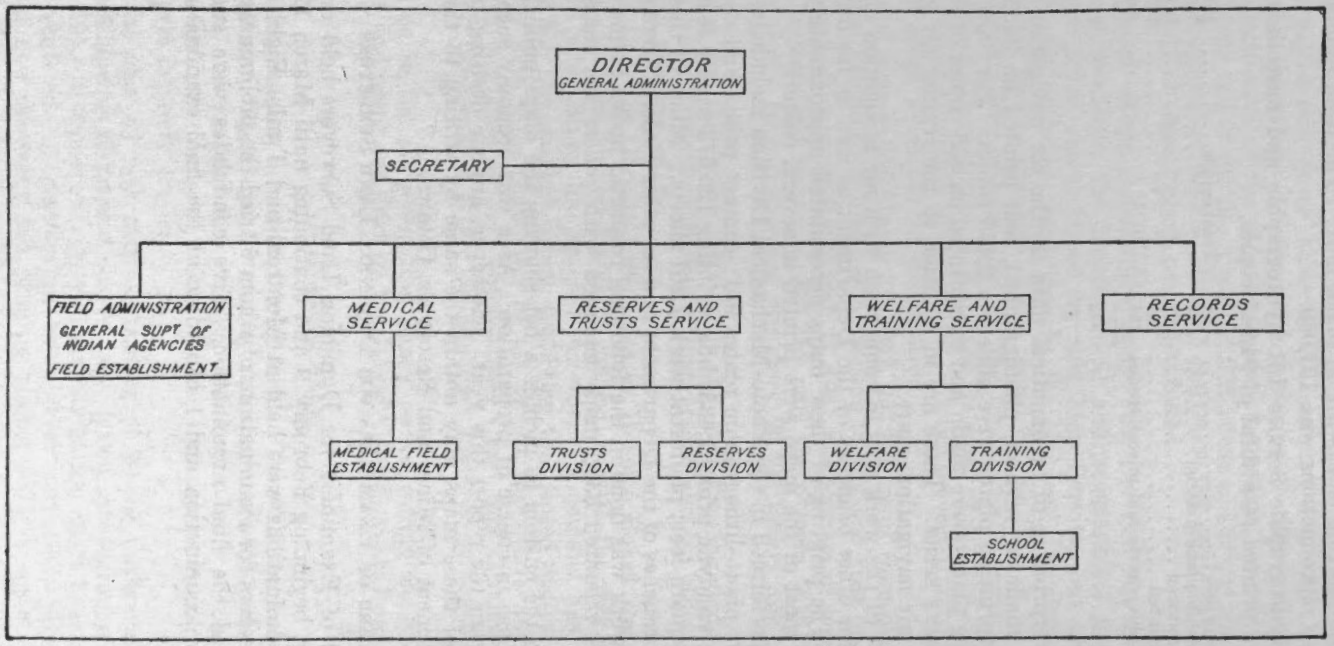
The work performed in the Photo-Mechanical Division included:—wet plate negatives 1,150; photo-lithographic plates 991; contact prints and enlargements 3,640; grids 19; vandyke prints 2,435; blue printing 126,673 square feet; vandyke printing 4,990 square feet; photostat work 7,261 sheets. Much of this work was done for other branches of the Department and for other Federal Departments.

Similarly, work was done in the following respects: books bound 8; binders made 48; maps mounted 330; maps mounted with rollers 18; maps mounted on board 6.

It has been the custom to include a list showing the maps published during the year and those in course of preparation. As a war economy such a list has been omitted from the report this year. However, anyone desiring information regarding any of these maps may obtain the same by writing to the Surveyor General, Department of Mines and Resources, Ottawa.

Board of Examiners for Dominion Land Surveyors

The Board of Examiners for Dominion Land Surveyors held one meeting during the year, beginning February 9 and continuing until March 12. During this meeting examinations were held at Montreal and Trail. Eight candidates presented themselves for examination, of whom 6 tried the preliminary examination and 2 tried the final examination. Five candidates were successful at the preliminary examination and 1 candidate at the final examination.



Organization Chart, Indian Affairs Branch.

INDIAN AFFAIRS BRANCH

Dr. H. W. McGILL, DIRECTOR

A review of the year shows that economic conditions among the Indians were good and that owing to war industries there was a marked increase in employment particularly on reserves located near industrial centres. Employment was obtained in the building trades, structural steel work, logging, lumbering, pulpwood cutting, mining, farm and bush work, and many other activities including for example sugar-beet growing. The hunting and fishing Indians and the large number engaged in agriculture had, in general, a prosperous year and enjoyed increased revenue from their respective vocations. These general observations are supplemented by some points of particular interest from various parts of the country in the paragraphs that follow.

Reports from the Northwest Territories indicated that the fur catch on the whole was fair and prices good. The supply of caribou was scarce in the Fort Resolution District and muskrat hunting in the spring was very poor. White foxes were plentiful towards the Barrens, where also there were sufficient caribou for the Indians from Fort Rae. Other bands trapping towards Marten Lake reported that the catch of fur was poor. Rabbits have increased in the Fort Norman and Fort Simpson Agencies, which with the better price of fur, helped the Indians considerably, although they complained of the depredations of wolves which have greatly reduced the number of moose in that region.

In most of the agencies in British Columbia the growing season was favourable but rains during harvesting destroyed considerable hay, grain, and root crops in the New Westminster, Lytton, and Nicola Agencies.

The Indians continue to give evidence of greater self-reliance and industry. This is not confined to any section of the population but is especially noticeable in the farming areas where it is increasingly realized that future support will depend upon the land. Agriculture and stock-raising have continued to progress during the past year. Indian boys and girls at Bella Coola formed a Potato Club which has developed into an outstanding success. High-grade potatoes were grown for use of the Indians and also a large quantity was sold. This project was conducted in accordance with requirements of the Provincial Department of Agriculture.

In the Lytton Agency about 5 acres of fibre flax were sown on Seabird Island Reserve. Excellent certified seed was secured for future use. Despite flood conditions, the Pemberton Indians in the New Westminster Agency continued to grow their now-famous "Snowflake" potatoes, which command a premium on the Vancouver market. An appreciable acreage of new land was brought under cultivation in the Stuart Lake, New Westminster, and Cowichan Agencies under various land improvement projects authorized by the Department. Milk was shipped to Vancouver from reserves in the Chilliwack, Langley, and Hammond areas.

The quality of Indian cattle, which is generally of a much higher standard than it was a few years ago, is being maintained and, where necessary, improved by a continued supply of well-bred bulls. Prices obtained for beef cattle have been high and increased interest is being taken in dairying in some areas. Dairy barns and equipment are being brought within the requirements of the Provincial regulations.

Game and fur were fairly plentiful and good prices for the latter prevailed. Indian trap-lines have been registered with the Provincial Game Commission.

Logging camps have been active in some districts and many Indians have had almost uninterrupted employment.

Salmon fishing continues to be the chief occupation of the Coast Indians, although considerable revenue was received from halibut fishing and clam digging.

The Royal Humane Society's medal was presented to a Bella Coola Indian for rescuing another Indian from drowning in the Bella Coola River.

Crops in the dry farming area in Alberta were only fair owing to lack of moisture, continual high winds, and soil-drifting. Considerable damage was done by sawflies. Crops on the irrigated area, which included wheat, oats, alfalfa, and some clover, were very good. The feed grown thereon, and that received from lessees, together with wild hay, was sufficient for the Indians' needs. At the Blood Agency the wheat crop was only fair, owing to drought. Part of this crop was combined, as it was short for cutting with binders. The oat crop was not very good and gave considerable straw which was used for feed. Summer-fallowing was also undertaken. The campaign for the eradication of noxious weeds was reported as progressing favourably. Additional storage space was necessary on account of the "quota" system of selling grain. A new 18,000-bushel granary was built on the Greater Production Home Farm and another at the Agency headquarters. These have proved of great assistance in storing seed. The 100-acre community field at the Stony Agency again produced a good crop of oats. The potato crop was fair and gardens generally suffered from lack of moisture.

The herds of fine high-grade cattle in this province now compare with any standard herds and only pure-bred bulls are purchased. Prices received for beef cattle were very satisfactory and were reported as the highest paid in the respective localities. A new concrete dipping vat was constructed at the Peigan Agency for the dipping of cattle. Grazing was not so good as last year owing to drought. The stock-watering dams constructed in 1939 on the Blood and Peigan Reserves continue to prove of immense value to the stock. The special herd which was started at the Blood Agency, with the object of supplying all meat rations for destitute Indians of that agency will issue female stock to Indians as foundations for new herds. Fish was plentiful for home consumption, but commercial fishing was not remunerative. In the northern part of the province the fur catch was fairly good and prices were higher than last year. Indians who trap north of the North Saskatchewan River have to register their trap-lines with the Provincial authorities.

The summer was so dry and hot in the Province of Saskatchewan that the crops were very poor and it was surprising that the Indians were able to thresh any grain at all. Only the White Bear and Carry the Kettle Indians had sufficient rain, and a few reserves in the Carlton Agency. However, the winter proved to be one of the best and work was plentiful. Approximately 400 able-bodied Indians went to work in the bush camps. Rabbit pelts were sold at a fair price and the Indians also trapped other fur-bearing animals. Their revenue was also supplemented by the sale of wood and a certain amount of hay. Reports indicate that the Indians came through the winter exceptionally well, both financially and physically. Gardens were poor owing to the dry weather. There are about 25 Homemakers' Clubs in the province which are doing splendid work, and too much praise cannot be given to the women who are carrying on this service. The household knowledge acquired is clearly evident in the improved condition of the Indians' homes and general mode of living. There was a slight increase in the live-stock holdings of the Saskatchewan Indians. They now possess over 6,000 head of cattle and between cattle and horses the total

amounts to 10,500. The value of cattle sold and used for beef by the Indians of this province amounted to over $55,000. Good management on the part of Indian Agents contributed to the value of the transactions and the direct result was a decrease in the amount of relief provided.

Several Indians in Manitoba have small flocks of sheep. The wool from these sheep is spun and made into socks, mitts, and sweaters for home use. The wheat yield was light because of the reduced acreage and dry weather in some districts. Flax was grown but light yield and low price resulted in poor returns. Coarse grains gave only a fair yield. Generally speaking, garden crops were good. The potato crop was light but the corn crop in the Griswold Agency was the best in years. Late summer rains improved pastures and hay meadows, and all Indians obtained plenty of hay.

The fishing and trapping Indians in this province made a good living. Catches were fair and prices good. The muskrat project near The Pas provided steady income for many Indians. The bush Indians found work plentiful as there was a good demand for firewood and pulpwood. The large lumber companies in the north and in Ontario gladly employed Indian labour. All able-bodied Indians could find work and make a living. Two Homemakers' Clubs have functioned successfully and are having a beneficial effect upon the Indians.

An area of 7,000 square miles suitable for the propagation of fur-bearing animals has been secured from the Province of Ontario in the James Bay district. This area has been leased for a period of 5 years with the privilege of renewal. Arrangements have been made already for the restocking of this area with beaver. This is the first extension of the Co-operative Fur Conservation program into Ontario.

The demand for Indian labour in the province, particularly in southern Ontario, exceeded the supply. Indian girls experienced no difficulty in securing steady employment as domestics and a large number of young men secured gainful employment in munition factories. The earnings of these people have enabled them to repair their homes and there has been an improvement in general conditions on a number of the reserves.

A notable feature of the agricultural operations throughout the province was the number of contracts entered into by the Indians with the canning factories for the supply of corn, tomatoes, beans, peas, and other vegetables grown on the reserves. The eagerness with which the factories sought a renewal of these contracts after a year's experience and the willingness of the Indians to re-sign, indicated that these contracts have proved satisfactory to both parties and have doubtless encouraged the cultivation of reserve lands that ordinarily might have remained idle.

Weather conditions during the growing season were favourable and resulted in a satisfactory harvest. Despite absence from the reserves of a number of Indians who have enlisted or are working in munitions factories, progress made agriculturally, judged from the standpoint of the quantity and quality of the produce grown, was satisfactory and well in advance of that made in recent years.

Conditions in the province in regard to hunting and trapping were satisfactory and with a continuance of the open season for beaver, an average catch was experienced. Although prices were not so high as in 1940, there was sufficient to provide a good living for many Indian families. It was found that there was a general scarcity of marten throughout the entire area. The muskrat catch, however, was greater than the previous year and good prices obtained for pelts which realized an average of $2 each.

An increase in the price of fish resulted in greater interest and more extensive operations in this industry.

The hunting and trapping Indians of Quebec did fairly well and their returns have kept up satisfactorily. The northern Quebec Indians depend entirely upon wild life for a living. There has been a steady increase in the demand for skilled structural steel workers and labourers and the result has been a marked decrease in the number of unemployed. Very satisfactory results have been obtained with home gardens, especially at Maria, where a root cellar was built during the year. The gardens at the Restigouche Agency also showed great improvement. The native handicrafts were pursued with success at Pierreville, St. Regis, and Maria. The Caughnawaga Indians had the misfortune to lose their weaving equipment by fire. Employment in war industries and lumber camps provided increased income for many Indians which resulted in improved living conditions generally.

Conditions among the comparatively small Indian population of the Maritime Provinces do not vary to any appreciable extent from year to year. In Nova Scotia and Prince Edward Island, a policy of centralization is now under way which it is hoped will result in the Indian population becoming more self-supporting and to this end additional lands have been purchased. In New Brunswick, an average yield was secured in the growing of farm crops and potatoes from a slightly greater acreage than that sown in 1940-41. The revenue of the Indian families generally during the past year shows a marked increase over former years owing to the greatly improved opportunities which were available in casual and steady employment.

War Services

Indian enlistments in the Armed Forces in the present conflict are as follows:—

Prince Edward Island	18
Nova Scotia	70
New Brunswick	100
Quebec	119
Ontario	593
Manitoba	45
Saskatchewan	289
Alberta	51
British Columbia	162
Northwest Territories	*0
Yukon Territory	1
	1,448

Indians everywhere have shown a patriotic spirit and throughout Canada have manifested their loyalty in many ways. Generally they have shown a keen desire to assist in the war effort to the extent of their ability. Indian women also have given evidence of patriotism in a manner that reflects greatly to their credit and have taken an active part in local Red Cross activities.

The total amount of donations received at Ottawa from Indians for war purposes is $11,159.34. The Old Crow Indians in the Yukon Territory sent a contribution of $432.30 to the London Orphans Fund. This was referred to in an article appearing in the *London Times* of March 6, reporting a radio program on which two Indians with the Canadian troops in Britain spoke to their people at home. Children from South London, who had lost either one or both parents in air raids, thanked the Old Crow Indians for their generosity and told them that their welcome gift had bought boots and clothing for boys and girls who had suffered most cruelly in the air raids on London.

INDIAN HEALTH SERVICE

There was about the average incidence of infectious disease among the Indian population during the year. A severe epidemic of septic sore-throat in the Fond du Lac area caused 5 deaths.

Vigorous programs for inoculation against diphtheria have been carried out in northern Quebec and in Alberta.

In the campaign against tuberculosis full use has been made of beds in departmental hospitals, and the Provincial Anti-Tuberculosis organization has given generous co-operation. An average of approximately 700 Indians have been under treatment.

A nutritional investigation was undertaken during the year. It was found that a large section of the Indian population was suffering from dietary deficiencies. Measures to counteract this condition are being studied.

There is an increasing shortage of nurses and doctors, it being particularly difficult to obtain medical personnel in the outlying districts.

WELFARE AND TRAINING SERVICE

TRAINING

A table of pupil enrolment and attendance follows:—

Fiscal Year	Residential Schools		Day Schools		Total		
	Enrolment	Average Attendance	Enrolment	Average Attendance	Enrolment	Average Attendance	Percentage of Attendance
1932-33.....	8,465	7,613	8,960	5,874	17,425	13,478	77·40
1933-34.....	8,596	7,760	8,852	5,592	17,448	13,352	76·52
1934-35.....	8,709	7,882	8,851	5,560	17,560	13,442	76·54
1935-36.....	8,906	8,061	9,127	5,788	18,033	13,849	76·79
1936-37.....	9,040	8,176	9,257	5,790	18,297	13,966	76·34
1937-38.....	9,233	8,121	9,510	5,978	18,743	14,099	75·22
1938-39.....	9,179	8,276	9,573	6,232	18,752	14,508	77·36
1939-40.....	9,027	8,643	9,369	6,417	18,396	15,060	81·87
1940-41.....	8,774	8,243	8,651	6,110	17,425	14,353	82·37
1941-42.....	8,840	8,283	8,441	5,837	17,281	13,935	80·63

An educational program based on the vocational opportunities of the various areas has been gradually extended and provision made at practically all residential schools and a number of day schools for courses of study in agriculture, elementary domestic science, shopwork—carpentry, auto mechanics, electric welding, etc. Difficulty has been experienced in securing teachers with the training necessary to provide worthwhile vocational instruction for boys. The Department is wholly dependent on the provincial normal schools for its supply of teachers; and the normal school graduate is usually unfamiliar with the needs and peculiar characteristics of the Indian pupil. A report of an I.Q. survey of a number of residential schools in Ontario, undertaken by the Provincial Department of Education, suggests that it may be necessary in the future to provide special courses of study for Indian day and residential school teachers. An acute shortage of fully qualified teachers, however, is now in evidence throughout the Dominion, and in view of this shortage, it would be exceedingly difficult to persuade teachers to undertake additional training at any time in the immediate future.

A large number of senior pupils are displaying a keen interest in organized movements such as the Girl Guide Association, Boy Scout troops, and Cadet Corps. Youth organizations are now in existence at the following Indian Day Schools: Birch Island, Manitoulin Island Agency, Ontario; Tobique, at Maliseet, New Brunswick; Skidegate and Massett, Queen Charlotte Agency, and Port Simpson, Skeena Agency, British Columbia; and at the Grouard and Morley Residential Schools, Alberta. These organizations provide the Indian youth with valuable lessons in the art of self-government. They encourage him, too, to assume responsibility for the accomplishment of tasks that he can complete better and more economically for himself than any other agency that might be designed to help him.

In an attempt to encourage pupils to take an active interest in the care and feeding of animals, two small herds of goats have been established at the Spanish and Norway House Indian Residential Schools. A constant milk supply is one of the most urgent needs of Indian bands in the northern regions of the Dominion.

The classroom building at the File Hills Residential School, Saskatchewan, and the senior day school at Caughnawaga, Quebec, were totally destroyed by fire during the year.

Indian Education—Ordinary Expenditure, 1941-42

—	Day Schools	Residential Schools	General	Total
	$ cts.	$ cts.	$ cts.	$ cts.
Nova Scotia	10,104 39	26,337 84	.....	36,442 23
Prince Edward Island	864 46	.....	.....	864 46
New Brunswick	13,400 73	.....	.....	13,400 73
Quebec	54,962 63	13,340 95	.....	68,303 58
Ontario	97,982 81	273,157 52	.....	371,140 33
Manitoba	50,801 30	178,611 32	.....	229,412 62
Saskatchewan	33,281 35	279,724 78	.....	313,006 13
Alberta	1,454 01	309,825 13	.....	311,279 14
British Columbia	70,354 34	318,093 26	.....	388,447 60
British Columbia Schools Vocational Instruction	.....	.....	9,995 03	9,995 03
Northwest Territories	1,420 80	37,987 10	.....	39,407 90
Yukon	1,465 74	18,019 18	.....	19,484 92
Assistance to Ex-pupils	.....	.....	1,323 85	1,323 85
Freight and Express	.....	.....	37 85	37 85
Salaries and Travel	.....	.....	17,742 91	17,742 91
Stationery	.....	.....	39,684 32	39,684 32
Tuition	.....	.....	18,511 31	18,511 31
Miscellaneous	.....	.....	241 16	241 16
Total	336,092 56	1,455,097 08	87,536 43	1,878,726 07

WELFARE

Indians enjoyed a higher standard of living throughout the year than they have enjoyed at any time in recent years. Little difficulty has been experienced in securing gainful employment on farms, in fishing and pulpwood operations, and in war industries. These conditions are reflected in relief costs, which show a reduction of $175,571.51 when compared with the preceding year.

There is little evidence, however, to indicate that the Indian has become in any sense more frugal as the result of the period of economic depression from which he is now emerging. The failure of the Indian population, when work is plentiful and wages high, to provide for their future needs or to spend their earnings on worthwhile projects, such as the repair and furnishing of their

dwellings, is one of the most perplexing features of the welfare program, although in many cases they are showing improvement in this respect.

Large quantities of discarded military clothing—shoes, greatcoats, socks, and battle-dress blouses—have been distributed to Indian agencies. Unusual interest and skill has been displayed by Indian women, members of Homemakers' Clubs, in the repair and remodelling of this clothing.

Initial steps have been taken and additional lands purchased with the object of establishing the entire Indian population of Nova Scotia on two reserves—Shubenacadie and Eskasoni. These Indians, nearly all of whom have been in receipt of relief in recent years, have been residing on 20 small reserves under the supervision and direction of 20 part-time agents. This administrative set-up has never been wholly satisfactory, and relief and welfare costs have been steadily increasing from year to year. The employment of two full-time agents and the resources at the disposal of the Indians on the new reserves should enable the Indian population of Nova Scotia to become increasingly more self-reliant and self-supporting.

Arrangements have also been made whereby the Indian population of Prince Edward Island now residing on five small reserves will be centralized on Lennox Island.

Welfare Expenditures by Provinces, 1941-42 and 1940-41

Province	1941-42	1940-41	Province	1941-42	1940-41
	$ cts.	$ cts.		$ cts.	$ cts.
Nova Scotia	88,709 95	70,850 52	British Columbia	76,498 94	104,006 68
Prince Edward Island	8,644 99	6,536 17	Northwest Territories	15,625 53	21,938 18
New Brunswick	34,753 28	48,506 52	Yukon	12,244 13	12,913 88
Quebec	124,353 38	200,636 46	Triennial Clothing	6,665 36	6,340 55
Ontario	95,375 48	126,471 26	Miscellaneous	19,265 97	23,142 18
Manitoba	83,930 19	93,518 42	Handicraft	4,665 96	4,874 64
Saskatchewan	80,172 49	94,647 13			
Alberta	56,451 18	68,545 75		707,356 83	882,928 34

HANDICRAFT

Handicraft products valued at $25,000 were sold from the central warehouse at Ottawa during the calendar year 1941. This represents an increase of approximately $11,000 over the value of goods marketed the preceding year.

Difficulty was experienced, particularly toward the end of the year, in securing certain raw materials—woollen yarns, Hong Kong cord, beads, cartons, etc.

Indians at present engaged in handicraft projects are, with few exceptions, either physically unfit or too old to secure regular employment in war or other industries. The actual cash paid to these Indians for their work during the year amounted to $17,084.61. Of this amount approximately $10,000 was paid to the residents of Caughnawaga, Pierreville, Lorette, St. Regis, Rama, Port Arthur, Muncey, and Christian Island Reserves. The sale of these products provides Indian workers with a supplementary source of revenue and one that is very much appreciated. In addition to the handicraft products marketed through the central warehouse at Ottawa, large quantities have been marketed by Indians without departmental assistance, through the ordinary commercial channels. This is particularly true in the Province of British Columbia.

Grants to Agricultural Exhibitions and Indian Fairs, 1941-42

New Brunswick—	
Fredericton Exhibition	$ 25 00
Gagetown Fair	25 00
Ontario—	
Ohsweken Agricultural Society, Brantford	225 00
Garden River Agricultural Society, Sault Ste. Marie	100 00
Caradoc United Indian Fair, Muncey	150 00
Caradoc United Ploughing Association	50 00
Manitoulin Island Unceded Agricultural Society	150 00
Thunder Bay Agricultural Association	250 00
Tyendinaga Agricultural Society	100 00
Plowing Matches	800 00
Field Prizes, Standing Crop Competitions	400 00
Garden Prizes, Standing Crop Competitions	300 00
Manitoba—	
Rossburn Agricultural Society	25 00
Manitoba Provincial Exhibition, Brandon	250 00
Garden Prizes, Standing Crop Competitions	75 00
Saskatchewan—	
Prince Albert Agricultural Society	400 00
Regina Agricultural & Industrial Exhibition Association, Limited	400 00
Garden Prizes, Standing Crop Competitions	75 00
Alberta—	
Calgary Exhibition	500 00
Edmonton Exhibition Association, Limited	400 00
Garden Prizes, Standing Crop Competitions	75 00
British Columbia—	
Cowichan Agricultural Society, Duncan	150 00
North & South Saanich Agricultural Society, Cowichan	50 00
Windermere and District Fall Fair, Kootenay	150 00
Chilliwack Fair, New Westminster	50 00
Vancouver Fall Fair	500 00
Armstrong Fall Fair, Okanagan	250 00
International Folk Festival & Exhibition, Vancouver	50 00
General—	
The Canadian Handicrafts Guild	50 00
Handicraft Exhibits	450 00
	$ 6,475 00

CONSTRUCTION AND ENGINEERING WORKS

Agency Buildings and Structures

Repairs and improvements were carried out at practically all Indian Reserves in Canada. New Agency buildings and structures were provided as follows:

Manitoba.—A potato storehouse was built at Portage la Prairie Agency, and a warehouse at Cross Lake Reserve, Norway House Agency. A building was purchased for use as a warehouse for The Pas Agency and a ration house was purchased for the Clandeboye Agency, Manitoba.

Alberta.—A storehouse was built at Fort Vermilion and a warehouse at Driftpile, both in the Lesser Slave Lake Agency. A granary was built at the Blood Agency headquarters.

British Columbia.—Residence and garage were purchased at Massett, British Columbia, for the use of the Indian Agent.

Northwest Territories.—A powerhouse to replace one destroyed by fire was built at Fort Resolution.

Roads

Roads on Indian reserves requiring attention were improved, and the work on the road through the Spanish River Indian Reserve, leading to the town of Massey, Ontario, was continued. Stone was crushed during the winter at the Caughnawaga Reserve and gravel was hauled for the St. Regis Reserve roads, in the Province of Quebec.

Bridges

Bridges were repaired on Indian reserves where required and a culvert over the Suzanne Drain on the Caughnawaga Reserve was replaced.

Water Supplies

A new well was provided for the Pointe Bleue Agency residence, Quebec. Wells were deepened or drilled at the Fairford Reserve in the Portage la Prairie Agency, Manitoba; Poorman's Reserve and Nut Lake Reserve, in the Touchwood Agency. A slough was cribbed to provide water for Gordon's Reserve also in the Touchwood Agency; Thunderchild Home Farm in the Battleford Agency; and a spring as a source of water was developed at the Onion Lake Agency, Saskatchewan. Stock water dams were repaired at the Blood and Peigan Indian Reserves, Alberta. A well was drilled on the Okanagan Indian Reserve No. 7, in the Province of British Columbia.

Fencing

Fences were constructed or repaired at Walpole Island, Ontario; Maria, Quebec; Fisher River, Manitoba; File Hills, Saskatchewan; and Hobbema, Alberta.

Drainage

The cleaning of the Suzanne Drain at the Caughnawaga Reserve, Quebec, was continued and work on the Pemberton Indian Reserve No. 8, British Columbia, was carried out to prevent flooding of agricultural land.

Irrigation Systems and Miscellaneous

Funds were transferred to the Surveys and Engineering Branch for the construction, maintenance, and repair of irrigation systems on Indian reserves in British Columbia. A list of the works carried out will be found in the report of that Branch. Funds were also transferred for other works requiring engineering supervision.

Water softeners were installed at Caughnawaga and St. Regis, Quebec. New furnaces were installed at the Caradoc Indian office, Ontario, the Clerk's house at Crooked Lakes, Saskatchewan, and the Farming Instructor's house at Saddle Lake, Alberta. Lighting plants were installed at Christian Island, and Moose Factory, Ontario; Onion Lake, Saskatchewan; and at Fort Resolution, Northwest Territories. Batteries for lighting plants were purchased for the Carlton Agency and the File Hills Agency, Saskatchewan. Water system at the Royal Canadian Mounted Police buildings at the Stony Agency, Alberta, was installed. Departmental boats requiring attention were repaired.

RESERVES AND TRUSTS SERVICE

RESERVES DIVISION

Land Sales and Leases

During the fiscal year a total of 73 sales affecting lands considered to be surplus to Indian needs were made. Thirty of these sales were for cash, totalling $10,145.06; forty-three were time sales involving approximately 5,000 acres of agricultural lands and 21 subdivision lots to a total value of $35,296.38. A total of $45,441.44 was added to the assets of the various bands in the form of cash or interest-bearing securities.

Collections on land contract agreements amounted to $111,301.78, of which $43,940.13 was added to the Capital Account of the bands and $67,361.65 to Interest Account. In addition to the above $9,819.58 was collected and held in suspense pending completion of lease and sale agreements. Collections on land contracts showed an encouraging increase of approximately twenty per cent over the preceding year.

With reference to old land sale contracts, 40 were paid out in full; 30 were cancelled for non-fulfilment of the conditions of sale; and 13 were consolidated with other contracts by rulings made under the provisions of the Farmers' Creditors Arrangement Act.

The total number of current time sales at the end of the fiscal year stood at 711, a decrease of 40 from the previous year. A reduction in the number of land sales is in accordance with the policy of the Branch to retain possession of all suitable lands to meet the future needs of an increasing Indian population.

Rentals collected under leases, permits, etc., for the fiscal year amounted to $190,202.38, an increase of $44,238.01, or 30 per cent, over the previous fiscal year. This increase is largely accounted for by better crop conditions and a higher price level in the Prairie Provinces where most of these lands are located, and partly to an increased acreage under lease.

Adjustments Under the Farmers' Creditors Arrangement Act

Forty-nine land sale contracts were reviewed under the above Act and resulted in gross reductions in arrears of $101,108.27, of which $74,655.43 was on account of principal and $26,452.84 on account of interest. The result of these adjustments is a healthier tone in the land sales account, and the elimination of part of the uncollectable accumulation of principal and interest arrears is a source of satisfaction.

Fur Conservation

The co-operative effort with the provinces for the development of substantial fur areas throughout Canada in the interest of the Indian population has been continued. The public muskrat development in Manitoba, in which the Branch had a substantial interest, was an outstanding success. Over 750 trappers were employed and 169 Indian families participated in a distribution of over $53,000 during the year, an average of approximately $25 per family per month.

The development of the Two Island Muskrat Rehabilitation Project, also in Manitoba (160,000 acres), was carried through its third and final year under the control of this Service. During the three years under development the muskrat population is estimated to have increased from approximately 650 to 65,000, and a small crop is being taken in which Indians share.

Satisfactory progress was reported from four fur conservation areas in Saskatchewan in course of development in co-operation with that province. From one of these it is expected a substantial fur crop will be harvested by Indians in the spring of 1942.

In the Province of Quebec another large beaver and fur preserve north of the Eastmain River was added to the two already under development.

In Ontario the first beaver preserve in that province was established under departmental management at Kasagami Lake in the James Bay region and preliminary organization work got under way.

Examinations of other areas in Ontario and Manitoba were conducted during the year.

Restoration work continued in the Wood Buffalo National Park areas of northern Alberta directed toward the rehabilitation of both muskrat and beaver.

The extension of the trap-line system in British Columbia has been continued by the purchase of the rights of white trappers when possible and when they conflicted with the Indian interest. That system has also been extended in some measure into the Province of Alberta. The co-operation received from the provinces in this respect has been most helpful.

Indian Estates

The benefits and advantages to be derived from the exercise of the administrative jurisdiction of the Branch over the estates of deceased Indians are becoming increasingly evident to the Indian. The natural resentment to what in some cases was deemed an intrusion into a field formerly governed by tribal custom has largely disappeared and the past year has been featured by the increased co-operation given the Branch by both individual Indians and band councils. This has resulted in a marked increase in the number of estates submitted for administrative supervision and in the number on which the administration has been completed and the assets distributed among those entitled thereto.

Timber and Forestry

The timber on Indian reserves constitutes one of their most valuable assets. During the year attention has been given to educating the Indians and the Indian Agents in procedure and practice under the regulations designed to promote the conservation and wise exploitation of this natural asset. Throughout the year the demand for timber products has been good and the prices better than average. Every precaution has, however, been taken to restrict operations where timber stands were immature or where the preservation of the stand would better serve the Indian when outside employment was less easy to obtain.

During the past year the timber resources on Indian reserves in Canada involved the sale and utilization of timber products as follows:—

	(ft. b. m.)
Amount of saw timber cut under licence	12,953,960
Amount of saw timber cut by Indians under permit	4,719,006
Total	17,672,966

In addition the Indians, under permit, harvested wood products such as pulpwood, fuelwood, poles, ties, shingle bolts, and Christmas trees.

Revenues added to the capital funds of the Indian bands from the sale of timber products are as follows:—

Under licence	$38,259 48
Under permit to Indians	30,219 66
Amount received from rentals, fees, etc	3,616 48
	$72,095 62

Statement of Timber Cut from Indian Reserves, Season 1941-42

Provinces	Timber, ft.b.m.	Pulpwood, Cords	Fuelwood, Cords	Poles	Fish Stakes	Ties	Xmas Trees, Bales	Pit Props, Cords	Shingle Bolts, Cords
Nova Scotia	12,000	.....	.....	.....	.....	.....	.....	86	.....
New Brunswick	1,302	200·84	.....	.....	.....	.....	.....	10	.....
Quebec	2,518,320	4,473·00	3·00	10	.....	.....	.....	.....	.....
Ontario	6,154,125	26,921·55	5,296·82	6,644	3,723	25,351	.....	.....	17·00
Manitoba	.....	679·00	3,040·00	150	.....	.....	.....	.....	.....
Saskatchewan	359,135	.....	.....	.....	.....	11,784	.....	.....	.....
Alberta	1,724,182	.....	.....	150	.....	.....	.....	.....	.....
British Columbia	6,903,384	.....	98·00	614	.....	.....	33,445	.....	48·66
Totals	17,672,948	32,274·39	8,437·82	7,568	3,723	37,135	33,445	96	65·66

Amount of saw timber cut under licence, 12,953,960 ft.b.m., having a total royalty value of ...	$ 38,259 48
Amount of timber cut by Indians under permit, 4,719,006 ft.b.m. (Saw timber together with other wood products) having a total value in dues of	30,219 66
Amount received from rentals, fees, etc.	3,616 48
	$ 72,095 62

Forest Protection

Losses sustained during the past year because of forest fires, and the cost of protecting Indian timber assets, increased considerably over the past two years in spite of the fact that every precaution has been urged on the Indian population, and every available organized means for combating forest fires has been employed. The past season was an exceptionally bad one for forest fires, especially in Eastern Canada. The total amount expended on forest fire protection on Indian reserves this year was $8,283.63, as against $7,689.40 for 1940 and $4,320.16 for 1939.

Mining

There continues to be some interest in prospecting for minerals on Indian reserves, but there has not been any new development work. A total revenue of $3,855.66 was received, consisting of royalties from the sale of sand and gravel, $2,996.58; rentals and fees, $859.08. The Indians on the Blackfoot Reserve continue to operate a coal mine, taking out a small quantity of coal for local consumption.

Petroleum and Natural Gas

In the search for oil in Western Canada, interest continued to be focused on several of the Indian reserves in the Province of Alberta. Extensive and costly geological investigations seem to indicate that the Blood, Sarcee, Stony, and Blackfoot Reserves are potential oil-fields and exploration and test drilling operations were actively carried on during the year. Following an exhaustive seismographic survey, two deep test-wells were drilled on the Blood Reserve during the summer months and while in both an oil structure was encountered producing a good quality of oil the quantity was not sufficient for commercial production. Very valuable geological and other information was secured from these two drilling operations.

On the Sarcee Reserve two deep test-wells were started during the latter part of the year and drilling is still under way. Geological investigation carried out on this reserve over an extended period is encouraging, but this area is likely to prove a deep drilling proposition and this in itself is somewhat of a deterring factor.

Several Indian reserves in the Province of Saskatchewan are also looked upon with some favour, but pending preliminary exploration no deep drilling will be undertaken.

During the year substantial revenues were obtained in permit fees and lease rentals, such monies, in each case, being credited to the funds of the Indian bands concerned.

Indian Enfranchisement

There were 32 enfranchisements carried out during the past fiscal year, comprising a total of 60 individuals.

TRUSTS DIVISION

The Division administered some 469 trust accounts belonging to Indian bands throughout Canada. On March 31, 1942, the aggregate fund totalled $14,642,345.47. The comparison with the previous year is as follows:—

Trust Balances	Capital	Interest
March 31, 1942	$12,168,534 05	$2,473,811 42
March 31, 1941	12,093,507 52	2,322,323 12
Increase	$ 75,026 53	$ 151,488 30

Receipts were derived from: Earned interest, land sales, land rentals, mining dues, timber royalties, oil land rentals, and fines. Expenditures comprised: Capital and interest distributions, relief expenditures, band loans, agricultural assistance, road construction and repair, and enfranchisement. These reflect the conduct of Indian business throughout the year and were as follows:—

Total receipts credited to band funds	$1,410,298 82
Total expenditures paid from band funds	1,183,191 25
Excess receipts over expenditures	$ 227,107 57

Band Loans

Indians from bands throughout the Dominion have continued to avail themselves of the opportunity of obtaining loans from their respective capital accounts. These advances are made where they will enable individuals to enjoy more fully the productive value of their lands and for purposes which generally will promote the welfare and progress of the bands. The improvement in employment opportunities has made possible a substantial increase in the proportion of collections of recoverable advances both as to current loans and debts contracted during the depression years.

One hundred and eighty-one loan applications were considered by the Loan Board, 133 of which were granted to a total of $21,875.25, averaging $164.48.

Collections on current indebtedness during the year were exceptionally satisfactory exceeding as they did over 90 per cent of all amounts falling due. Of a total approaching $120,000 which accumulated as debt during the depression years well over 60 per cent has been collected, the greater part of which was effected within the fiscal year under review, the outstanding balance having been reduced to a total slightly over $45,000.

Personal Savings Accounts

In addition to the general funds of the bands the Division administers 1,088 individual savings accounts representing a total of $252,760.91 as at

March 31, 1942. A comparative statement of deposits and withdrawals is as follows:

	1940-1941	1941-1942
Deposits	$45,137 69	$50,648 94
Withdrawals	$38,393 49	$45,149 69
Net increase in funds on deposit or approximately 10 per cent.		$ 5,499 25

Annuities

The usual arrangements for payment of Indian treaty annuities was made throughout the Dominion, the total distributions being $262,127. The distribution of these annuities commenced in April and was completed by September 1. Improvement in the methods adopted in this connection has resulted in a more efficient distribution and a noticeable saving in the time of the departmental officers employed in the work.

SUMMARY OF INDIAN AFFAIRS BY PROVINCES AND TERRITORIES

PRINCE EDWARD ISLAND

Agency.—There is only one agency in the Province, located at Summerside. 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.—Subsistence farming is engaged in by a number of Prince Edward Island Indians, with many of them owning their own live stock. During the past year outside work has been readily available with many of the Indians finding continuous employment in urban centres as well as in the lumbering and fishing industries. Basket-making, especially among the older Indians, has also been engaged in, with profitable results.

Dwellings.—The homes are fairly good and increased employment has resulted in improved living conditions generally.

NOVA SCOTIA

Agencies.—There are nineteen Indian agencies in Nova Scotia, namely, Annapolis, Antigonish-Guysborough, Cape Breton (Sydney), Cape Breton (Eskasoni), Colchester, Cumberland, Digby, Halifax, Hants, (Shubenacadie), Hants (Windsor), Inverness, Kings, Lunenburg, Pictou, Queens, Richmond, Shelburne, Victoria, and Yarmouth.

Tribal Origin.—The Indians are of Algonkian stock and like the Indians of Prince Edward Island bear the distinctive name of Micmac.

Occupations.—While many of the Indians raise their own gardens, any other agricultural pursuits that are engaged in are on a small scale. With the progress of the war, however, more Indians are finding employment with white farmers and fruit growers. Their natural ability as guides and canoemen is utilized during the tourist season, and their skill at making baskets and at woodworking is another important source of income. They also work in lumber camps and as labourers.

Dwellings.—The houses on most of the reserves consist of one and one-half story frame buildings, fairly well finished on the outside.

NEW BRUNSWICK

Agencies.—There are three agencies in New Brunswick: the Northeastern, at Richibucto; the Northern, at Perth; and the Southwestern, at Fredericton.

Tribal Origin.—Most of the Indians belong to the Micmac race, which is of Algonkian stock. There are also some bands of Maliseets, also of Algonkian stock.

Occupations.—Except for growing potatoes and vegetables for their own use, little farming is engaged in by the Indians of the Province of New Brunswick. The potato crop in the State of Maine, however, provides seasonal employment for many Indians every year. They also hunt and fish and act as guides. Many work in lumber camps and sawmills, while others earn a living as day labourers. In certain parts of the Province they are engaged commercially in the manufacture of axe and pick handles and baskets.

Dwellings.—Housing is similar to that in other parts of the Maritime Provinces.

QUEBEC

Agencies.—The 18 Indian agency offices in Quebec are located as follows: Amos (Abitibi), Bersimis, Cacouna (Viger), Caughnawaga, Gagne (Maria), Gaspe, Gentilly (Becancour), Harrington Harbour (St. Augustine), Maniwaki, Mingan, Notre Dame du Nord (Timiskaming), Oka, Pierreville, Pointe Bleue, Restigouche, St. Regis, Seven Islands, Village des Hurons (Lorette).

Tribal Origin.—The principal tribes found in Quebec are: Iroquois at Caughnawaga, Lake of Two Mountains, and St. Regis; the Hurons of Lorette are also of Iroquoian stock; the Montagnais, who are of Algonkian stock, at Bersimis, Mingan, Lake St. John, Seven Islands; the Abenakis, of Algonkian stock, at Becancour and St. Francis; the Micmacs, of Algonkian stock, at Maria and Restigouche; and the Maliseets, of Algonkian stock, at Viger.

Occupations.—The Indians of Caughnawaga are noted steel workers and find highly remunerative employment in that trade. The native handicraft projects organized in this Province continue to prove successful. The Indians of the northern interior and the north side of the Gulf of St. Lawrence depend almost entirely on hunting, trapping, and fishing for their subsistence. In the Saguenay district they act as guides and canoemen and also find employment in lumber camps and mills. The Indians in the organized central and southern portions engage in mixed farming. They raise fruit and dispose of it at nearby markets, and those who possess cows sell the milk to the creameries and cheese factories. A few also act as game guardians on established beaver preserves.

Dwellings.—Many of the Indians in the older settled districts own houses of stone, brick, or frame construction. In the more remote parts they live in tents during the greater part of the year. Because of increased employment housing conditions generally have improved.

ONTARIO

Agencies.—The Indian agency offices in Ontario, 24 in number, are located as follows: Brantford (Six Nations), Chapleau, Chippawa Hill (Saugeen), Christian Island, Deseronto (Tyendinaga), Fort Frances, Golden Lake, Highgate (Moravian), Kenora, Longford Mills (Rama), Manitowaning (Manitoulin Island), Moose Factory (James Bay), Muncey (Caradoc), Parry Sound, Peterborough (Rice and Mud Lakes), Port Arthur, Sarnia, Sault Ste. Marie, Scugog, Sioux Lookout, Sturgeon Falls, Virginia (Georgina and Snake Islands), 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 Pottawottamies at Walpole Island, and Delawares at the Caradoc (Muncey) Agency; these are of Algonkian stock.

Occupations.—In northwestern Ontario the Indians are dependent largely on fishing and the trap-line for their living. In eastern Ontario they engage in lumbering. All northern reserves are reasonably well stocked with merchantable timber. In the southern and western parts of the province farming is the chief source of revenue, although the Indians in these sections, close to industrial centres, are to a marked degree becoming absorbed into the industrial life of their respective communities. When advantageously located to do so, the Indians engage in guiding during the tourist season, in which they are particularly efficient, and in themselves actually constitute an attraction to tourists unfamiliar with the aboriginal races.

Dwellings.—As in other provinces, because of increased employment, housing conditions generally have improved. Many Indians own houses of brick, stone, or modern frame construction in the more settled districts. The Indians of the northern part of Ontario are nomadic and consequently live in tents most of the year.

MANITOBA

Agencies.—There are seven Indian agency offices in Manitoba, 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.—Fishing, hunting, and trapping constitute the main sources of livelihood for the Indians inhabiting the lake regions and northern sections of Manitoba. The large commercial fishing companies employ many Indians from the lake regions. Agriculture is confined chiefly to the Birtle, Griswold, Portage la Prairie, and Clandeboye Agencies, although Indians from other agencies work in the harvest fields in the farming communities. The new sugar beet industry is also providing work for Indians in the beet fields. Good herds of cattle, principally of the Shorthorn type, and other live stock are to be found on many reserves, and their products are a vital source of income to the Indians of southern Manitoba. Surplus hay is sold, the hay presses owned by some of the Indians enable them to ship their surplus in winter. Taking out wood for winter fuel requirements has always been an Indian occupation, while recently more and more Indians have been engaging in cutting pulpwood. Indian women find their native handicraft, particularly the manufacture and sale of gloves and moccasins, a profitable undertaking.

Dwellings.—On most of the reserves in Manitoba the houses are of log construction, one and one-half stories high with shingle roofs. They are usually white-washed every year which improves their appearance and makes for greater sanitation. There are also a number of houses of frame construction on all reserves. In the extreme north the habitations are more primitive.

SASKATCHEWAN

Agencies.—The nine Indian agency offices in Saskatchewan are located as follows: Balcarres (File Hills), Battleford, Broadview (Crooked Lakes), Duck Lake, Kamsack (Pelly), Leask (Carlton), Muscow (Qu'Appelle), Onion Lake, Punnichy (Touchwood).

Tribal Origin.—The most numerous tribes among the Saskatchewan Indians are the Ojibwas, Swampy Crees, and Plains Crees, which all belong to the Algonkian stock. In addition to these, Sioux Indians are found at the Crooked Lakes, Qu'Appelle, and Carlton Agencies, and on the Moose Woods Reserve. In the Onion Lake Agency there is a band of Chipewyans, who are of Athapaskan stock. There are also a few Chipewyan Indians in the Ile a la Crosse district.

Occupations.—Farming and stock-raising comprise the chief occupations of Saskatchewan Indians. They are equipped with good implements and horses and employ the same advanced modern farming methods as their white neighbours. Their cattle are of a good type, most of them being of the Shorthorn breed. In the north central sections of the province they supplement their incomes by selling their surplus hay and taking out fuelwood, while farther north they still depend almost entirely upon hunting, trapping, and fishing for their livelihood. They make good woodsmen. The recent shortage in the pulpwood industry has opened new opportunities for earning good money to Indians from all parts of the province, many of them finding work in the wooded sections of Saskatchewan and several hundred going as far away as Kapuskasing, Ontario, to alleviate the acute shortage in the timber areas.

Dwellings.—On most of the reserves the Indians are fairly well housed, the homes being usually of log construction with shingle roof; others are of frame construction. In the north when the Indian is out on his hunting grounds his home consists of a log cabin with sod roof in winter, and a tent in summer.

ALBERTA

Agencies.—The ten Indian agency offices in Alberta are located as follows: Brocket (Peigan), Calgary (Sarcee), Cardston (Blood), Driftpile (Lesser Slave Lake), Fort Chipewyan (Athabaska), Gleichen (Blackfoot), Hobbema, Morley (Stony), Saddle Lake, Winterburn (Edmonton).

Tribal Origin.—The Alberta Indians are of Algonkian stock, with the exception of the Sarcees near Calgary and the Beavers and Slaves in the Lesser Slave Lake Agency, who are Athapaskan; the Paul's band in the Edmonton Agency, who are Iroquoian, and the Stonies, who are of Siouan stock. The Algonkian Indians of Alberta are subdivided into Blackfoot Nation, comprising the Indians of the Blackfoot, Blood, and Peigan Agencies; and Plains Crees found in the Lesser Slave Lake, Saddle Lake, Edmonton, and Hobbema Agencies.

Occupations.—Stock-raising is the principal occupation of the Indians of the southern and foothills regions where they have large herds of horses, and cattle herds of excellent Hereford and Shorthorn types. They grow grain on up-to-date well equipped farms. Indians in the northern parts while mainly occupied in hunting and trapping also engage in fishing and selling fuelwood. Those Indians who do not farm for themselves find employment with farmers and ranchers; haying, harvesting, and working in the beet fields for several months during the summer. A number also work in lumber camps, sawmills and as labourers. The Blackfoot Indians operate two coal mines of their own and obtain a substantial revenue from the sale of coal.

Dwellings.—The condition, on the whole, of the homes and farm buildings is good. Changes are gradually being made by enlarging some of the houses, or dividing large one-roomed houses into several rooms resulting in more healthful living conditions. The majority of the houses are well kept and increased employment has resulted in the purchase of additional furniture. Frame houses and barns are found on the Sarcee and Edmonton reserves. Other houses are of log construction with shingle roofs.

BRITISH COLUMBIA

Agencies.—The Indian agency offices in British Columbia are located at 18 different points as follows: Alert Bay (Kwawkewlth), Bella Coola, Cranbrook (Kootenay), Duncan (Cowichan), Fort St. John, Hazelton (Babine), Kamloops, Lytton, Massett (Queen Charlotte Islands), Merritt (Nicola), New Westminster, Port Alberni (West Coast), Prince Rupert (Skeena), Telegraph Creek (Stikine), Vancouver, Vanderhoof (Stuart Lake), Vernon (Okanagan), Williams Lake.

Tribal Origin.—The Indians of the Bella Coola, Cowichan, Kamloops, Lytton, New Westminster, Nicola, Vancouver and Okanagan Agencies belong to the Salish tribes. The Kootenay tribe is located in the agency of the same name. The Kwakiutl-Nootka tribe is located at the Kwawkewlth and West Coast Agencies; the Haidas, in the Queen Charlotte Islands; the Tlingits, in the Stikine; and the Tsimshians in the Skeena Agency. The Indians of the Babine, Stuart Lake, and Williams Lake Agencies belong to the Athapaskan race. The Indians of the Peace River Block are Athapaskan, with the exception of a small group of Saulteaux and Crees at Moberly Lake who are Algonkian.

Occupations.—The coast Indians exhibit skill as salmon fishermen and the fishing industry has continued to be their chief occupation. Many own their own power boats and up-to-date equipment and either fish independently or under contract with the canneries. Herring canneries give work to a large number of Indians, especially Indian women who give excellent satisfaction as cannery workers along the coast. They also engage in clam digging, while others work at various occupations such as logging and as unskilled labourers. Indians of the central and northern interior regions make their living by trapping on registered trap lines, while towards the south they are turning their attention more and more to agriculture and other pursuits. Many engage successfully in cattle and horse-raising; while others are making a success of fruit-growing, some of them having orchards of their own. Whole families participate in the seasonal migratory labour movement to pick fruit, hops, etc., which frequently takes them into the United States in their wayfaring.

Dwellings.—Special attention continues to be given to the improvement of Indian homes. All new houses are built upon modern lines of the small compact type used by white labouring classes, and greater interest is paid to ventilation, heating, and sanitation than formerly.

The best Indian houses are found on the northwest coast among the Haidas of Queen Charlotte Islands, the Tsimshians of Port Simpson, Metlakatla, and Port Essington, and Kwakuitls of Bella Bella. The gradual improvement in all farm buildings and out-buildings continues.

NORTHWEST TERRITORIES

Agencies.—The Indian Affairs Branch has three agencies in the Northwest Territories, namely, Fort Simpson, Fort Resolution, and Fort Norman.

Tribal Origin.—The principal tribes found in the far north are the Slaves, Hares, Loucheux, Sekani, Dogribs, Yellow Knives, Chipewyans, and Caribou-

Eaters. All these tribes are of Athapaskan stock. The most northerly tribes are the Takudah, whose territory extends to the Mackenzie Delta; and the Copper Mines, who are located along the Coppermine River. The territory occupied by these two last-named tribes is contiguous to that inhabited by the Eskimos.

Occupations.—The Indians depend almost entirely upon hunting and trapping for a livelihood, and a few cultivate potatoes and garden vegetables. They own no cattle or horses. Large quantities of fish are caught and preserved for their own use and for dog feed during winter. Wild berries are also picked and dried for winter use.

Dwellings.—These Indians live in log cabins in winter and in tents and teepees in the summer.

YUKON

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 derive some revenue from the sale of moccasins and curios of various kinds, and the men are expert at making toboggans and snowshoes. Little farming is carried on owing to climatic conditions but some of the Indians cultivate patches of potatoes and other vegetables for their own use.

Dwellings.—The Indians of the Yukon live in log cabins.

TABLE 1

Census of Indians: Arranged Under Provinces, 1939

Province	Number in Province	Religion							Under 7 years		From 7 to 16 inclusive		From 17 to 21 inclusive		From 22 to 65 inclusive		From 65 years upwards	
		Anglican	Baptist	United Church	Presbyterian	Roman Catholic	Other Christian Beliefs	Aboriginal Beliefs	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Alberta	12,163	1,709	.....	1,558	.....	8,745	.....	151	1,374	1,444	1,423	1,406	559	561	2,454	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

Land: Private and Public Buildings and Property

Province	Total Area of Reserve (Acres)	Acres under Wood	Acres Cleared but not Cultivated	Acres under actual Cultivation	Acres Fenced	Private Property								Public Property					
						Stone, Brick and Frame Dwellings	Other Dwellings	Outbuildings, etc.	Ploughs, Harrows, Drills, etc.	Mowers, Reapers, Binders, Threshers, etc.	Carts, Wagons and Vehicles	Automobiles	Tools and small Implements	Churches	Council Houses	School Houses	Saw Mills	Other Buildings	Engines and Machinery
Alberta	1,348,448	374,852½	919,045	54,550½	497,992½	427	1,885	2,480	2,264	1,517	2,419	111	9,438	12	7	9	1	155	272
British Columbia	780,716	480,926	264,470	35,320	283,842	4,680	2,868	4,258	2,733	958	2,283	502	42,010	154	71	57	8	69	168
Manitoba	529,424	391,599	123,532	14,293	51,141	150	2,813	1,818	865	632	1,307	95	8,140	55	14	40	3	113	50
New Brunswick	37,394	35,951½	1,082	360½	1,161	378	40	225	62	19	62	21	1,129	6	5	7	.....	5	2
Northwest Territories	1,924	1,813¼	47	63½	57½	.....	320	186	2	.....	.....	.....	500	.....	1	.....	.....	.....	.....
Nova Scotia	18,187	16,341¼	1,352	493½	1,956	392	105	107	59	14	81	16	1,868	13	4	11	1	5	5
Ontario	1,325,399	1,191,864¼	85,865	47,669½	104,520	2,821	2,274	3,621	3,916	1,155	3,163	590	47,577	105	42	92	11	114	189
Prince Edward Island	1,508	1,405	25	78	188	38	.....	22	11	8	8	.....	50	1	1	1	.....	1	2
Quebec	175,049	153,652½	14,856	6,540½	10,489	1,505	465	2,340	629	277	1,331	137	6,229	26	5	31	1	35	37
Saskatchewan	1,201,307	415,638	738,946	46,723	341,798	293	2,308	3,087	2,448	1,792	2,889	44	14,953	47	26	28	3	83	68
Yukon	3,550	3,542	5½	2½	5½	1	.....	3	3	1	5	2	3	1	.....	.....	.....	1	4
Total	5,422,906	3,067,586¾	2,149,225½	206,093¾	1,293,150½	10,685	13,078	18,147	12,992	6,373	13,548	1,518	131,897	420	176	276	28	581	797

Statement of Ordinary Expenditure for Year 1941-42

—	Branch Administration	Indian Agencies	Reserves and Trusts	Medical	Grants to Hospitals	Welfare	Education	Grants to Residential Schools	Grants to Exhibitions	Total
	$	$	$	$	$	$	$	$	$	$
Nova Scotia	12	6,615	2	30,268	.....	88,710	10,523	25,918	.....	162,048
Prince Edward Island	.....	1,662	.....	4,159	.....	8,645	864	.....	.....	15,330
New Brunswick	.....	7,348	.....	18,442	.....	34,753	13,401	.....	.....	73,944
Quebec	159	44,834	3,688	83,485	.....	124,353	54,970	13,334	.....	324,823
Ontario	712	107,087	678	161,707	.....	95,376	116,610	254,531	2,092	738,793
Manitoba	25	74,663	428	93,384	.....	83,930	62,638	166,774	275	482,117
Saskatchewan	72	115,426	979	69,832	2,500	80,173	45,571	267,435	800	582,788
Alberta	355	113,164	61	68,795	1,080	56,451	7,828	303,452	950	552,136
British Columbia	1,234	128,258	895	174,964	.....	76,499	80,022	308,425	1,046	771,343
Northwest Territories	.....	17,718	.....	31,555	4,320	15,626	1,963	37,446	.....	108,628
Yukon	.....	172	.....	9,880	.....	12,244	3,407	16,078	.....	41,781
Headquarters and Miscellaneous	50,270	13,489	25,966	24,519	.....	30,597	77,541	.....	500	222,882
Hospitals and Nursing Stations	.....	.....	.....	244,978	.....	.....	.....	.....	.....	244,978
Tuberculosis Control	.....	.....	.....	318,621	.....	.....	.....	.....	.....	318,621
British Columbia Special	.....	17,731	.....	41,397	.....	29,993	9,995	.....	.....	99,116
Pensions and Gratuities	.....	1,920	.....	100	.....	.....	.....	.....	.....	2,020
	52,839	650,087	32,697	1,376,086	7,900	737,350	485,333	1,393,393	5,663	4,741,348
Statutory Indian Annuities	.....	.....	.....	.....	.....	.....	.....	.....	.....	262,127
" Pensions	.....	.....	.....	.....	.....	.....	.....	.....	.....	690
										5,004,165

Open Account—Indian Act Revolving Fund 1941-42

EXPENDITURE

Quebec		$ 6,957 75

REPAYMENTS AND REFUNDS

Quebec	$ 9,173 79	
Manitoba	2,892 00	
Saskatchewan	4,349 74	
Alberta	886 40	
		17,301 93
Repayments over expenditure		$ 10,344 18

Net Expenditure by Provinces 1941-42

FUR CONSERVATION

Quebec	$ 7,239 70
Ontario	2,881 72
Manitoba	29,147 28
Saskatchewan	12,412 82
Alberta	110 57
British Columbia	380 80
Northwest Territories	12,036 76
Head Office	6,845 77
Total	$ 71,055 42

Indian Trust Fund

Showing transactions in connection with the fund during the fiscal year ended March 31, 1942:—

Service	Debit	Credit
	$ cts.	$ cts.
Balance, March 31, 1941		14,415,815 94
Collections on land sales, timber and stone dues, rents, fines, fees, etc.		669,010 50
Interest for the year ended March 31, 1942		731,604 93
Credit transfers during the year		9,105 35
Expenditure during the year	1,172,600 07	
Transfers by Warrant, etc.	10,646 68	
Balance, March 31, 1942	14,642,289 97	
Total	15,825,536 72	15,825,536 72

SCHOOL STATEMENT

Statement Showing the Enrolment by Provinces in the Different Classes of Schools for the Fiscal Year ended March 31, 1942

RESIDENTIAL SCHOOLS

Province	Number of Schools	Denomination				Number on Roll			Average Attendance	Percentage of Attendance	Grades								
		Church of England	Presbyterian	Roman Catholic	United Church	Boys	Girls	Total			I	II	III	IV	V	VI	VII	VIII	IX
Nova Scotia	1	.....	.....	1	.....	82	78	160	155	96·87	33	17	17	32	24	13	10	8	6
Quebec	2	1	.....	1	.....	26	38	64	59	92·18	16	12	25	11	.....	.....	.....	.....	.....
Ontario	13	5	1	6	1	773	863	1,636	1,580	96·57	414	297	256	234	153	111	87	61	23
Manitoba	9	1	1	4	3	505	580	1,085	1,015	93·54	333	176	159	147	147	68	18	22	15
Saskatchewan	14	3	.....	9	2	847	897	1,744	1,620	92·89	569	273	237	242	186	119	74	21	23
Alberta	19	5	.....	12	2	930	1,019	1,949	1,835	94·15	632	282	284	263	215	146	83	35	9
Northwest Territories	4	1	.....	3	.....	67	117	184	160	86·95	107	30	20	12	9	5	1	.....	.....
British Columbia	14	2	.....	9	3	894	1,048	1,942	1,790	92·17	630	304	293	272	200	112	97	23	11
Yukon	2	2	.....	.....	.....	37	39	76	69	90·79	20	13	11	8	11	8	3	1	1
Total—Residential Schools	78	20	2	45	11	4,161	4,679	8,840	8,283	93·70	2,754	1,404	1,302	1,221	945	582	373	171	88

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	12	8	20	15	75·00	7	3	2	1	5	.....	2	.....	.....
Nova Scotia	11	135	155	290	196	67·58	122	53	46	31	15	9	8	6	.....
New Brunswick	10	130	134	264	208	78·78	73	60	37	19	35	21	10	6	3
Quebec	28	680	662	1,342	1,061	79·06	438	266	197	171	124	87	23	22	14
Ontario	84	1,191	1,281	2,472	1,808	73·14	776	389	310	258	249	190	140	135	25
Manitoba	43	610	548	1,158	663	57·25	695	192	123	72	46	21	5	3	1
Saskatchewan	28	319	329	648	397	61·26	331	112	93	47	35	15	14	1	.....
Alberta	1	19	11	30	18	60·00	13	3	3	3	.....	3	5	.....	.....
Northwest Territories	4	18	30	48	32	66·66	26	8	8	1	2	.....	.....	3	.....
British Columbia	63	950	986	1,936	1,263	65·23	895	317	264	187	140	66	42	25	.....
Yukon	2	14	12	26	19	73·07	15	.....	6	5	.....	.....	.....	.....	.....
Total—Day Schools	275	4,078	4,156	8,234	5,680	68·98	3,391	1,403	1,089	795	651	412	249	201	43

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	7	7	14	11	78·57	1	3	7	2	1	.....	.....	.....	.....
Ontario	4	86	61	147	119	80·95	63	20	18	14	11	11	4	6	.....
Manitoba	3	19	13	32	17	53·12	23	4	3	1	.....	.....	1	.....	.....
Saskatchewan	1	4	5	9	6	66·66	4	1	.....	3	.....	1	.....	.....	.....
British Columbia	1	1	4	5	4	80·00	4	.....	.....	1	.....	.....	.....	.....	.....
Total—Combined White and Indian Day Schools	10	117	90	207	157	75·84	95	28	28	21	12	12	5	6	.....

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	12	8	20	15	75·00	7	3	2	1	5	.....	2	.....	.....
Nova Scotia	11	1	.....	12	217	233	450	350	77·77	155	70	63	63	39	22	18	14	6
New Brunswick	10	.....	.....	10	130	134	264	208	78·78	73	60	37	19	35	21	10	6	3
Quebec	28	2	1	31	713	707	1,420	1,129	79·50	455	281	229	184	125	87	23	22	14
Ontario	84	13	4	101	2,050	2,205	4,255	3,438	80·80	1,253	706	584	506	413	312	231	202	48
Manitoba	43	9	3	55	1,134	1,141	2,275	1,676	73·67	1,051	372	285	220	193	89	24	25	16
Saskatchewan	28	14	1	43	1,170	1,231	2,401	2,013	83·40	904	386	330	292	221	135	88	22	23
Alberta	1	19	.....	20	949	1,030	1,979	1,787	90·30	645	285	287	266	215	149	88	35	9
Northwest Territories	4	4	.....	8	85	147	232	186	80·17	133	38	28	13	11	5	1	3	.....
British Columbia	63	14	1	78	1,845	2,038	3,883	3,048	78·50	1,529	621	557	460	340	178	139	48	11
Yukon	2	2	.....	4	51	51	102	85	83·33	35	13	17	13	11	8	3	1	1
Totals	275	78	10	363	8,356	8,925	17,281	13,935	80·63	6,240	2,835	2,419	2,037	1,608	1,006	627	378	131

IMMIGRATION BRANCH

F. C. BLAIR, DIRECTOR

The number of immigrants admitted to Canada in 1941-42 was 8,865 as compared with 11,496 in the previous year. This is the lowest recorded immigration since any organized effort was made to count the number of persons entering Canada to find new homes. During the war period 1914-18 the lowest immigration figure reached was 37,453 in 1916, of whom 11,600 came through ocean ports and 25,853 from the United States. Of the arrivals of 1941-42, 2,554 entered through ocean ports and 6,311 from the United States. The racial origins were: British 6,318; French 736, while the remaining 1,811 represented 36 other racial groups.

The movement of immigrants has been severely restricted by war conditions, but in addition to the few thousands admitted as immigrants for permanent residence, a very considerable number of refugees and others were granted temporary entry for varying periods, mostly for the duration of the war. Two of the non-immigrant groups were of special interest, these being: (*a*) young men entering for military training under one or other of the Allied training schemes carried on in Canada; (*b*) technicians and skilled workers of European origins admitted to assist in Canada's war production effort. While statistics of these two groups are not being published, it may be remarked that no more useful or welcome people were admitted to Canada during the year.

When war broke out in September, 1939, the United Kingdom Government, in order to conserve manpower, established a regulation requiring that all persons resident in the United Kingdom or Northern Ireland, both males and females between the ages of 16 and 60, must obtain Exit Permits before migration. This had the immediate effect of curtailing the exodus of British subjects. In Continental Europe the usual highways of travel were closed altogether in the early summer of 1940, with but one or two exceptions.

Tourist Movement

It is inevitable that war conditions and war regulations would affect the ordinary flow of tourists and other non-immigrant travellers both out of and into Canada. The extent to which this was so is disclosed in the following figures of the non-immigrant movement both for Ocean and International Boundary ports. It will be observed that the first table shows non-immigrants entering Canada from abroad, and the second table shows residents of Canada returning after visits abroad. Both tables include not only tourists but all other classes of non-immigrants such as persons travelling on business who may cross the border several times in the course of a year.

Non-Immigrants entering Canada from Abroad

	Via Ocean Ports	From U.S.A.	Totals
Fiscal year ended March 31, 1938.....	47,832	31,179,807	31,227,639
" " " 1939.....	53,822	29,099,356	29,153,178
" " " 1940.....	42,126	28,295,332	28,337,458
" " " 1941.....	34,035	18,381,660	18,415,695
" " " 1942.....	28,395	17,983,877	18,012,272

Residents of Canada returning after Visits Abroad

	Via Ocean Ports	From U.S.A.	Totals
Fiscal year ended March 31, 1939.....	30,446	12,098,397	12,128,843
" " " 1940.....	18,757	11,590,952	11,609,709
" " " 1941.....	10,687	5,224,356	5,235,043
" " " 1942.....	14,113	4,047,167	4,061,280

The figures given above have no relation to the table of Returning Canadians which appears in the next paragraph nor are they referred to in any of the statistical tables appearing later in this report. In the ocean port arrivals of the first table there are included refugees who were admitted at ocean ports for temporary residence in Canada.

Returning Canadians

Since the beginning of the fiscal year 1924-25, efforts have been made to record the return to Canada of Canadian born, British born, and Canadian naturalized persons who left this country to reside abroad and returned to resume their permanent residence in Canada. The number has not varied materially for several years until the past year when it dropped to 3,318. The following table gives the record since 1924:—

—	Canadian Born	British Born Outside Canada	Canadians Naturalized	Totals
Fiscal year, 1924-25	36,473	4,487	2,815	43,775
Fiscal year, 1925-26	40,246	4,102	2,873	47,221
Fiscal year, 1926-27	49,255	5,326	2,376	56,957
Fiscal year, 1927-28	35,137	3,280	1,470	39,887
Fiscal year, 1928-29	30,008	2,795	995	33,798
Fiscal year, 1929-30	26,959	2,030	841	29,830
Fiscal year, 1930-31	26,811	2,111	1,287	30,209
Fiscal year, 1931-32	17,691	1,069	651	19,411
Fiscal year, 1932-33	16,320	757	548	17,625
Fiscal year, 1933-34	8,366	397	409	9,172
Fiscal year, 1934-35	5,811	937	870	7,618
Fiscal year, 1935-36	4,854	418	542	5,814
Fiscal year, 1936-37	4,522	319	223	5,064
Fiscal year, 1937-38	4,524	356	329	5,209
Fiscal year, 1938-39	3,825	360	386	4,571
Fiscal year, 1939-40	3,687	505	369	4,561
Fiscal year, 1940-41	4,910	177	53	5,140
Fiscal year, 1941-42	3,123	143	52	3,318

Administrative Work at Ottawa

The administrative work of the Branch has called for the greatest care in dealing with the problems that have arisen from day to day and while the movement of persons was smaller than in pre-war years, there was greater need of care in examination of both immigrants and non-immigrants and also of crews of vessels. What is involved in the examination of crews and crew lists may be judged from the fact that in the Atlantic District alone more than 12,000 crew manifests were filed for action during the year. Seamen's problems alone at some Atlantic ports involved more work than all ordinary immigration business at the same ports in pre-war years.

Incoming mail averaged 900 pieces per day and outgoing 530. It must be remembered, however, that in a service which deals with people on the move whose problems are often urgent, a considerable part of these problems is dealt with by telephone. At the busiest port in the Atlantic District there were 79,000 phone calls in and 37,140 phone calls out during the past year. Members of the Immigration staff serve on numerous inter-departmental committees which deal with war and other problems.

The Immigration Act provides for an appeal to the Minister of Mines and Resources in practically all cases where persons are rejected on seeking entry

to Canada and in all cases where deportation proceedings arise after entry to Canada. During the year 602 appeals were submitted to and dealt with by the Minister as compared with 653 the previous year and 606 in 1939-40. Owing to war conditions it has been impossible to arrange for the actual removal of deports destined to Europe. The number of deportations for the year was 455 compared with 425 for the previous year.

Inspectional Work in Canada

The organization of the Branch within Canada consists of a head office and four district offices which are known as, (*a*) the Atlantic District which covers all territory east of the Ontario-Quebec boundary; (*b*) the Eastern District extending from the Ontario-Quebec boundary westward to Schreiber; (*c*) the Western District which extends from Schreiber, Ont., to Kingsgate, B.C.; and (*d*) the Pacific District which includes all Canadian territory west of Kingsgate.

At the end of the year there were 40 seaports and 196 boundary ports, 5 inland agencies and 3 United States points of examination, making a total of 244. The administrative staff in Ottawa numbers 88 as compared with 166 in the fiscal year 1931-32 which was an all-time high. In the Field and Inspectional Service in Canada there has been some temporary increase in staff owing to extra work due entirely to war conditions. The increase of travel facilities by automobile, bus, and aeroplane has necessitated an increase in examining stations. An example of the increase in air travel is seen at the Montreal airport where incoming passengers which numbered 11,952 in 1939-40 increased to 15,627 in 1940-41 and 21,381 last year. There never was a time in our history when it was so necessary to maintain a careful examination of persons seeking entry and never before was the Branch so well equipped with trained personnel to do this work. There has been close co-operation during the year with the Royal Canadian Mounted Police and other branches of the Service.

Inspectional Work Abroad

In last year's Report the origin and objective of oversea immigration inspection was described and it was recorded then that since the outbreak of war Immigration offices had been closed at Liverpool, Glasgow, Belfast, Paris, Antwerp, Rotterdam, Hamburg, and Gdynia, leaving only London, Lisbon, and Hong Kong. At the close of 1941-42 only London remained.

The work in the London office like that of some other units, now consists of dealing mainly with problems created by the war such as assisting distressed Canadians seeking temporary relief or repatriation, dealing with distressed seamen, helping in the recovery of funds advanced to Canadian citizens unable to leave Europe, and the repatriation of dependants of Canadian personnel. Most of the work involved in the return of dependants will have to be done in the London office.

The demand for steamship passenger space to Canada resulted in the setting up of a Passage Priority Committee in Canada House in London under the direction of the Canadian High Commissioner. The space for civilians is allotted by the Ministry of War Transport and distributed by the Passage Priority Committee on which this Branch is represented. Special care was required during the year to control the arrival by freighters of passengers in transit to the United States who after having paid an exorbitant price for ocean transport found themselves in difficulty in not being able to continue their journey owing to the fact that the ships on which they arrived had not complied with United States regulations governing transit of passengers.

The London office reports that war conditions have brought all sorts of approaches for help from Canadians in financial distress as well as many appeals and requests for assistance from those who cannot be properly classed as Canadian citizens. Some advances for subsistence were necessary prior to repatriation and in many cases reference was made to Ottawa for verification of birth and other matters involved in repatriation.

For many years it has been the practice for residents of Canada to sign as seamen on ships sailing for the United Kingdom and although these men were supposed to have return transportation, numbers took their discharge overseas and were then in difficulty in getting back to Canada. During the year at least 200 of these appealed to the London office for assistance. Very few were found to be real seamen and none of them possessed the regular seaman's discharge book. Some who left Canada expecting to return on the same ship, found that their ship was assigned to foreign duty in which they were unwilling to serve and consequently left their ships and applied for repatriation.

When the usual avenues of exit from Europe were closed through enemy action, a Canadian inspectional office was opened in Lisbon in July, 1940, in charge of Mr. O. Cormier who had previously represented the Department in Paris. A Canadian medical officer belonging to the Department of Pensions and National Health was also stationed at Lisbon for some months but later returned to Canada. Inspectional work was carried on by Mr. Cormier until December, 1941, when the office was closed.

Mr. W. R. Little who had served the Department in various capacities over a long period of years and latterly as Commissioner of European Emigration in London, England, retired from the Service after completing an extra year beyond the usual retiring age.

Repatriation of Dependants

In January, 1942, it was decided by Government that free repatriation would be extended to dependants (wives, widows, and children) of Canadian personnel who served overseas with the Army, Navy, or Air Force. The assistance to be granted consists of ocean and rail fares at minimum rate to destination in Canada. In the case of those dependants who have already returned to Canada at their own cost, refunds are being made. Dependants who were born in Canada or who had previous residence in the Dominion are repatriated as opportunity offers, but those who married overseas and children born there will await the return of the family head. After the war of 1914-18 upwards of 50,000 women and children, dependants of Canadian personnel, were assisted to Canada from Great Britain. A large number of these had followed husbands or fathers overseas while many others were wives married overseas and children born there. To prevent a movement to Great Britain of persons whose services were not needed there and whose travelling would increase steamship congestion as well as an unnecessary burden of maintenance abroad, a regulation was made early in June, 1940, for the control of the sailing of women and children by means of an Exit Permit which was issued by the Department of External Affairs. At the close of the year under review that regulation was cancelled and a more restrictive one was made, the enforcement of which has been transferred to the Immigration Branch.

BRITISH EVACUEE CHILDREN

The British children, numbering about 6,000, who came to Canada in 1940 to remain for the duration of the war, have continued to receive care and maintenance in free foster homes throughout the Dominion. The care extended by

the provinces with the co-operation of the Dominion and the work of Children's Aid Societies, has continued for yet another year, not, however, without many problems arising which called for careful adjustment. These boys and girls are growing up; many are now attending high schools and collegiates and several have already entered Canadian universities. Amongst the older boys there is evidenced a determination to return to the parental roof—if it is still standing—and to follow their fathers' footsteps in the fight to preserve our liberties.

The National Advisory Committee for Children from Overseas which was set up in the summer of 1940 continues to function through its Executive Committee. The chairman of the National Committee and of the Executive is Dr. R. C. Wallace, Principal of Queen's University. Expenditures incurred by the provinces and the co-ordinating societies, are paid by the Committee out of funds received from residents of Canada or organizations in Canada, supplemented by grants from the Federal Government. In this connection special mention is made of two large gifts, one of $10,000 given in 1940-41 and a further $7,300 during the last fiscal year, from the Independent Order of Oddfellows (Ontario Branch). This organization has declared its intention to continue its efforts for the welfare of British evacuee children in Canada.

The Release of Sterling

In last year's Report reference was made to the temporary difficulties of British evacuees, both adults and children, owing to the impossibility of securing the transfer of sterling for needs that could not be met in Canada. In the autumn of 1941 Mr. Geoffrey Shakespeare, Parliamentary Under-Secretary, Dominions Office, under whose direction all C.O.R.B. (Government assisted) children had come to Canada, paid a visit to the various Provinces of the Dominion and inspected the work being done for the children. While here he saw the need for some provision for children and especially for mothers with children. Shortly after Mr. Shakespeare's return to London, an arrangement was completed which became effective on the 1st January, 1942, under which mothers with children may receive from overseas a maximum of £10 per month with an additional £3 per month for each child, these funds being transferred by relatives or friends. All British evacuee children in Canada without mothers, may receive £3 per month if the relatives overseas are able and willing to send it. The plan for the transfer of these sums is both speedy and safe. The relative overseas desiring to transfer funds within the prescribed amount obtains a permit from the United Kingdom Government, then deposits the amount in a Post Office giving the name and address of the payee. This record is immediately transferred to Canada by air mail and the Canadian Post Office at once issues a warrant to the payee for the amount of the transfer.

Release of Persons from Refugee Camps

In the summer of 1940 a considerable number of civilian refugees, most of whom were given asylum in the United Kingdom some months prior to the outbreak of war, were transferred from temporary internment camps in England to civilian internment camps in Canada, now called refugee camps. These were all nominally of enemy nationality, but few were regarded as enemy sympathizers. During the year several hundreds were released for temporary residence under what may be described as a parole system. Those released belonged mainly to three groups,—(*a*) students whose education had been interrupted by their internment in England at a time when certain restricted areas there were being evacuated; (*b*) skilled workers whose services were valuable in connection with our war production; (*c*) farm workers. Students were all paroled to indi-

vidual sponsors who had assumed responsibility for their maintenance and care and for school or university fees. Those released for employment were released to firms engaged in some work related to the war or in the case of farm workers to farmers requiring help. In every case release was contingent upon the approval of the Home Office in London whose wards these refugees are. So far the experiment is working out satisfactorily.

CHINESE IMMIGRATION

The present Chinese Immigration Act which came into effect on June 30, 1923, provides for the entry to Canada of the following classes:—

(*a*) Members of the diplomatic corps, consuls, consular agents and other Government representatives, their suites and servants;

(*b*) Children born in Canada of parents of Chinese origin or descent, who left Canada for educational or other purposes, on establishing their identity to the satisfaction of the controller at the port where they seek re-entry;

(*c*) (i) Merchants, as defined by regulations made by the Minister;

(ii) Students entering Canada for the purpose of attendance, and while in actual attendance at any Canadian university or college authorized by statute or charter to confer degrees.

(*d*) Persons in transit through Canada.

No Chinese immigrants were admitted during the fiscal year 1941-42 and only eight persons of Chinese origin have been landed in Canada since the Act came into force on June 30, 1923, including two who had made application for admission under legislation repealed by the Act and whose cases had been before the Courts. Two students, both women, who will return to their homeland upon completion of their studies, entered during the year under review.

Under the authority of Section 9 the Minister may authorize for a specified period, under permit, the temporary entry of persons of Chinese origin without such persons being subject to the provisions of the Act. Thirty-seven permits were issued during 1941-42 as follows: Actors, 11; Actresses, 7; Doctor (Dentistry), 1; Doctors (Medical), 2; Housewives, 3; Infants, 1; Journalists, 2; Nurse (Student), 1; Students, 8. Of the above, seven took their departure from Canada within the fiscal year and the remainder will depart within the period of validity of their respective permits. Bonds were required in the cases of actors and actresses, etc., guaranteeing that the persons concerned will adhere to the conditions of their entry.

The Act provides for the registration prior to departure and the right to return following an absence of two years of Chinese legally admitted to and lawfully resident in Canada. Owing to the cessation of direct sailings from ports in British Columbia, and to the fact that vessels sailing from San Francisco were also stopped early in the year the number of persons so registered out has shown a decided decrease; only 84 Chinese so registered during 1941-42. A total of 181 Chinese employed as seamen on vessels trading in international waters registered during the period under review.

Order in Council P.C. 10160 which was passed on December 31, 1941, provides that all persons of Chinese origin who had registered outward between December 1, 1938, and the date on which the war terminates, may delay their return to Canada either for two years beyond the termination of the war or for one year beyond the two-year period provided in Section 24 of the Chinese Immigration Act.

The Opium and Narcotic Drug Act and the Immigration Act provide for the deportation of aliens convicted under certain Sections of the first-mentioned Act; during 1941-42, 13 Chinese were so deported.

The Chinese Immigration Act is administered under the direction of the Minister by the Chief Controller and Controllers at designated Canadian ports of entry. The Department maintains a special staff on the Pacific Coast, and until the fall of Hong Kong had a special representative there dealing solely with the administration of this Act. Particular care is taken in the checking both inward and outward of Chinese crews. Shipowners and agents have special guards on duty during the periods vessels are in port. There were 9 desertions during the year for which shipowners paid $9,000 in penalties under the Act. Total revenue collected during 1941-42 was $9,655.

For the purpose of comparison the following table relating to Chinese immigration is furnished:—

—	Exemptions	Paying Tax	Percentage of Total Arrivals Admitted Exempt	Registered for Leave	Total Revenue
					$ cts.
1923-24	49	625	7·27	5,661	334,039 00
1924-25	.....	.....	.....	5,992	308,659 00
1925-26	.....	.....	.....	3,947	25,969 00
1926-27	.....	.....	.....	5,987	14,844 00
1927-28	1	2	33·33	5,087	25,679 00
1928-29	1	.....	100·00	5,480	30,795 00
1929-30	.....	.....	.....	5,682	30,799 00
1930-31	.....	.....	.....	5,783	28,846 00
1931-32	.....	.....	.....	4,387	11,584 00
1932-33	1	.....	100·00	3,626	9,152 00
1933-34	2	.....	100·00	2,156	7,237 00
1934-35	.....	.....	.....	2,103	6,506 00
1935-36	.....	.....	.....	2,138	6,501 00
1936-37	1	.....	100·00	2,059	9,893 00
1937-38	.....	.....	.....	792	2,359 00
1938-39	.....	.....	.....	817	2,959 00
1939-40	.....	.....	.....	933	4,066 00
1940-41	.....	.....	.....	637	5,633 85
1941-42	.....	.....	.....	265	9,655 00
Totals	55	627	8·07	63,532	875,175 85

The usual statistical data is submitted in a form calculated to supply the sort of information most likely to be useful and most frequently requested.

TABLE 1

Immigration to Canada from 1900 to 1942

—		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
" "	1941..	3,428	625	4,053	5,295	2,064	84	7,443	11,496
" "	1942..	2,353	201	2,554	5,075	1,180	56	6,311	8,865

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	563	79	75	1,453
Australian	3	11	46	58	204	322	185	180	171	203	1,383
Austro-Hungarian	5,692	8,557	13,095	11,137	10,089	10,170	4,045	21,376	10,798	9,757	104,716
Brazilian	.....	.....	.....	2	1	2	5	1	4	.....	15
Bulgarian	.....	1	7	14	2	71	179	2,529	56	557	3,416
Chinese	7	2	.....	.....	.....	18	92	1,884	1,887	2,156	6,046
Doukhobor	.....	12	.....	.....	24	204	.....	.....	.....	.....	240
Dutch	25	35	223	169	281	389	394	1,212	495	741	3,964
East Indian	.....	.....	.....	.....	45	387	2,124	2,623	6	10	5,195
Egyptian	1	3	1	3	2	18	10	8	2	2	50
Finnish	682	1,292	1,734	845	1,323	1,103	1,049	1,212	669	1,457	11,366
French and Belgian	492	654	1,240	2,392	2,539	2,754	1,964	3,885	2,658	2,037	21,215
German	984	1,048	1,687	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	169	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	20,388	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	9,706	9,585	3,525	818	958	174	336	2,751	43,057
Scotch	29,924	32,988	30,735	29,128	8,346	1,887	2,062	473	1,518	10,997	148,058
Welsh	1,505	1,699	2,019	1,787	598	102	88	54	106	682	8,640
Totals	123,013	138,121	150,542	142,622	43,276	8,664	8,282	3,178	9,914	59,603	687,215
African, South	86	144	22	56	23	11	1	4	.....	23	370
Albanian	.....	.....	.....	3	4	.....	.....	.....	.....	.....	7
Arabian	3	2	10	16	.....	.....	.....	.....	.....	.....	31
Argentinian	.....	.....	.....	2	5	.....	.....	.....	.....	2	9
Armenian	20	60	100	139	36	.....	3	2	.....	10	370
Australian	266	184	106	106	51	32	18	34	35	88	920
Austro-Hungarian	16,285	21,651	21,875	28,323	7,150	15	1	.....	2	8	95,310
Belgian	1,563	1,601	1,826	2,651	1,149	172	126	19	48	1,532	10,687
Brazilian	13	.....	.....	5	.....	2	.....	.....	.....	.....	20
Bulgarian	1,068	3,295	4,616	1,727	4,048	1	.....	.....	.....	1	14,756
Chinese	5,278	6,247	7,445	5,512	1,258	88	393	769	4,333	544	31,867
Cuban	.....	.....	.....	10	1	1	3	1	.....	2	18
Doukhobor	41	24	108	4	.....	.....	.....	.....	.....	.....	177
Dutch	931	1,077	1,524	1,506	605	186	151	94	59	154	6,287
East Indian	5	3	5	88	.....	1	.....	.....	.....	.....	102
Egyptian	3	.....	7	5	.....	.....	.....	.....	.....	.....	15
Finnish	2,132	1,646	2,391	3,183	459	139	249	113	2	44	10,358
French	2,041	2,094	2,755	2,683	1,206	180	199	114	222	1,584	13,078
German	2,533	4,664	4,953	5,537	2,472	27	9	1	1	12	20,209
Greek	777	693	1,390	1,102	1,147	145	258	45	4	39	5,600
Hebrew	5,143	5,322	7,387	11,252	3,107	65	136	32	22	116	32,585
Italian	8,359	7,590	16,601	24,722	6,228	388	758	189	49	1,165	66,049
Japanese	437	765	724	856	592	401	648	883	1,178	711	7,195
Macedonian	.....	.....	.....	17	132	.....	.....	.....	.....	.....	149
Maltese	.....	.....	128	402	19	4	109	144	2	405	1,213
Mexican	.....	3	9	9	.....	.....	.....	1	3	.....	25
Montenegrin	.....	.....	36	13	9	.....	1	.....	.....	.....	59
Negro	12	138	211	266	202	34	98	35	22	61	1,079
Newfoundland	2,229	2,598	1,036	496	338	255	1,243	1,199	512	443	10,349
New Zealand	116	61	39	24	21	18	12	13	15	31	350
Persian	19	19	20	19	7	3	.....	2	2	.....	91
Polish	2,177	5,060	9,945	9,793	1,976	8	12	.....	4	76	29,051
Portuguese	13	6	9	58	8	.....	1	1	.....	3	99
Roumanian	511	793	1,116	1,504	361	4	4	.....	.....	21	4,314
Russian	6,621	9,805	18,623	24,485	5,201	40	25	42	42	51	64,935
Scandinavian—											
Danish	535	628	798	871	326	167	145	74	44	233	3,821
Icelandic	250	205	231	292	145	15	9	3	12	11	1,173
Norwegian	2,169	1,692	1,832	1,647	788	232	303	235	91	179	9,168
Swedish	3,213	2,394	2,477	2,435	916	177	332	156	101	241	12,442
Serbian	50	209	366	193	220	6	1	.....	1	12	1,058
Spanish	197	191	296	1,138	755	11	76	28	12	15	2,719
Swiss	270	230	246	269	209	42	30	12	11	100	1,419
Syrian	124	144	232	278	79	3	9	2	.....	18	889
Turkish	469	632	770	187	33	.....	5	.....	.....	1	2,097
U.S.A. citizens, via ocean ports	203	143	121	121	41	15	20	28	21	55	768
West Indian	455	393	495	719	389	47	315	307	223	66	3,409
Others	.....	.....	.....	2	18	1	.....	.....	.....	20	41
Total, Continental, etc	66,620	82,406	112,881	134,726	41,734	2,936	5,703	4,582	7,073	8,077	466,738
From the United States	104,884	114,326	119,418	89,892	41,768	25,853	51,143	58,185	31,955	40,728	678,152
Total immigration	294,517	334,853	382,841	367,240	126,778	37,453	65,128	65,945	48,942	108,408	1,832,105

TABLE 4

Immigration to Canada for the Period April 1, 1920, to March 31, 1925

—	Fiscal Years					Totals
	1920–21	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-Slovakian	308	152	101	2,737	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	361	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	30	300
Newfoundland	1,042	367	1,552	5,346	1,288	9,595
New Zealand	40	25	33	50	107	255
Persian	1	9	1	5	18	34
Polish	4,061	2,707	2,921	4,211	2,734	16,634
Portuguese	4	.....	2	.....	3	9
Roumanian	969	759	427	1,431	2,056	5,642
Russian	1,077	321	222	3,058	5,411	10,089
Scandinavian—						
Danish	511	541	382	1,355	1,830	4,619
Icelandic	50	31	21	27	49	178
Norwegian	429	480	507	2,424	2,550	6,390
Swedish	715	442	948	3,536	2,138	7,779
Spanish	202	6	15	39	3	265
Swiss	235	187	152	1,585	680	2,839
Syrian	443	123	91	286	210	1,153
Turkish	8	3	3	27	29	70
Ukrainian	491	89	36	832	26	1,474
U.S.A. citizens, via ocean ports	110	67	32	134	96	439
Venezuelan	.....	.....	1	6	.....	7
West Indian	110	24	44	37	37	252
Total, Continental, etc.	26,156	21,634	16,372	55,120	42,366	161,648
From the United States	38,310	21,670	16,566	17,211	15,818	109,575
Total immigration	138,728	82,324	67,446	145,250	*111,362	545,110

TABLE 5

Immigration to Canada for the Period April 1, 1925, to March 31, 1930

—	Fiscal Years					Totals
	1925-26	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	1,003	2,080	2,171	1,222	696	7,232
Bohemian	8	22	7	8	20	65
Bulgarian	47	126	249	282	296	1,000
Chinese	.....	.....	3	1	.....	4
Croatian	1,006	1,085	902	990	771	4,754
Czech	805	721	714	846	434	3,520
Dalmatian	1	.....	.....	1	7	9
Dutch	1,180	1,674	1,928	1,599	1,755	8,136
East Indian	62	60	56	52	58	288
Esthonian	28	92	110	92	117	439
Finnish	1,617	5,120	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	240	583	786	634	2,510
Hebrew	3,587	4,471	4,296	3,301	3,544	19,199
Herzegovinian	.....	3	4	.....	.....	7
Italian	1,638	3,301	3,593	792	1,277	10,601
Japanese	421	475	478	445	194	2,013
Jugo-Slavian	1,604	2,084	1,450	2,824	921	8,883
Korean	.....	1	.....	.....	.....	1
Lettish	24	60	77	74	70	305
Lithuanian	165	842	1,037	1,608	964	4,616
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	222	237	284	383	1,461
Russian	925	1,127	948	908	765	4,673
Ruthenian	4,259	9,995	10,128	15,571	11,291	51,244
Scandinavian—						
Danish	1,112	2,030	3,835	3,311	2,685	12,973
Icelandic	53	30	28	24	6	141
Norwegian	1,072	3,384	4,327	2,434	2,256	13,473
Swedish	1,335	2,628	3,134	3,297	2,918	13,312
Serbian	454	885	411	390	375	2,515
Slovak	2,046	4,274	3,714	4,303	2,879	17,216
Spanish	12	29	28	18	26	113
Spanish American	.....	6	.....	3	.....	9
Swiss	320	568	614	490	473	2,465
Syrian	134	218	82	75	61	570
Turkish	17	8	4	3	6	38
Total, Continental, etc	40,256	73,180	75,721	78,283	68,479	335,919
From the United States	18,778	21,025	25,007	30,560	30,727	126,097
Total immigration	96,064	143,989	151,600	167,723	163,288	722,664

TABLE 6

Immigration to Canada for the Period April 1, 1930, to March 31, 1935

—	Fiscal Years					Totals
	1930-31	1931-32	1932-33	1933-34	1934-35	
English	14,662	4,275	1,940	1,375	1,380	23,632
Irish	4,233	791	323	283	291	5,921
Scotch	7,872	1,843	764	547	472	11,498
Welsh	817	179	70	55	55	1,176
Totals	27,584	7,088	3,097	2,260	2,198	42,227
Albanian	25	5	.....	1	3	34
Arabian	2	.....	2	.....	1	5
Armenian	21	4	1	7	1	34
Belgian	255	47	37	41	61	441
Bohemian	11	.....	7	.....	.....	18
Bulgarian	295	15	3	12	5	330
Chinese	.....	.....	1	2	.....	3
Croatian	482	106	96	108	155	947
Czech	225	69	65	52	77	488
Dutch	344	33	33	27	44	481
East Indian	80	47	62	33	33	255
Esthonian	63	6	.....	2	2	73
Finnish	2,297	92	30	51	59	2,529
French	347	87	88	74	86	682
German	7,840	727	518	401	301	9,787
Greek	388	20	37	34	35	514
Hebrew	2,908	202	346	599	335	4,390
Italian	1,007	414	255	267	325	2,268
Japanese	204	195	115	104	93	711
Jugo-Slavian	364	57	56	63	120	660
Lettish	28	4	.....	4	.....	36
Lithuanian	466	45	57	37	37	642
Magyar	2,401	397	364	509	362	4,033
Maltese	13	5	2	.....	.....	20
Montenegrin	3	.....	.....	.....	.....	3
Moravian	2	.....	3	.....	.....	5
Negro	120	15	9	19	5	168
Persian	2	.....	1	.....	.....	3
Polish	3,997	554	360	374	406	5,691
Portuguese	5	2	1	2	2	12
Roumanian	179	22	26	27	52	306
Russian	879	74	62	61	60	1,136
Ruthenian	6,413	502	414	421	586	8,336
Scandinavian—						
Danish	820	53	55	43	21	992
Icelandic	25	.....	1	.....	1	27
Norwegian	740	70	44	31	37	922
Swedish	730	79	17	19	10	855
Serbian	140	31	26	37	26	260
Slovak	1,957	337	252	395	595	3,536
Spanish	8	9	7	7	7	38
Spanish American	1	2	.....	4	.....	7
Swiss	211	24	17	19	22	293
Syrian	54	15	19	14	13	115
Turkish	7	1	.....	2	.....	10
Total, Continental, etc.	36,359	4,367	3,489	3,903	3,978	52,096
From the United States	24,280	14,297	13,196	7,740	5,960	65,473
Total immigration	88,223	25,752	19,782	13,903	12,136	159,796

TABLE 7

Immigration to Canada for the Period April 1, 1935, to March 31, 1942

—	Fiscal Years							Totals
	1935-36	1936-37	1937-38	1938-39	1939-40	1940-41	1941-42	
English	1,286	1,445	1,949	2,247	2,489	2,408	1,852	13,676
Irish	249	262	364	387	375	235	122	1,994
Scotch	484	519	604	665	643	406	179	3,500
Welsh	30	38	55	74	59	55	29	340
Totals	2,049	2,264	2,972	3,373	3,566	3,104	2,182	19,510
Albanian	1	4	8	10	4	.....	.....	27
Arabian	.....	.....	4	4	.....	.....	.....	8
Armenian	4	3	4	5	2	2	.....	20
Belgian	72	93	123	187	100	30	10	615
Bohemian	1	1	5	2	332	3	.....	344
Bulgarian	22	18	28	29	15	1	.....	113
Chinese	.....	1	.....	.....	.....	.....	.....	1
Croatian	157	240	277	265	106	7	.....	1,052
Czech	106	134	188	169	290	49	17	953
Dalmatian	.....	1	.....	1	.....	.....	.....	2
Dutch	111	90	119	237	264	51	11	883
East Indian	20	13	14	14	11	6	3	81
Esthonian	2	5	2	12	3	1	1	26
Finnish	43	49	79	58	57	2	1	289
French	95	135	134	138	152	129	104	887
German	209	367	523	586	1,021	39	23	2,768
Greek	53	75	115	127	115	26	3	514
Hebrew	655	391	317	621	1,321	284	111	3,700
Italian	341	299	408	365	186	43	1	1,643
Japanese	83	103	139	46	36	44	1	452
Jugo-Slavian	106	106	116	250	55	1	.....	634
Lettish	3	2	11	4	3	1	.....	24
Lithuanian	22	42	37	39	49	6	.....	195
Magyar	314	328	622	532	329	35	4	2,164
Maltese	.....	4	2	1	.....	.....	1	8
Mexican	.....	6	1	2	.....	.....	.....	9
Montenegrin	.....	.....	2	8	.....	.....	.....	10
Moravian	.....	.....	3	9	52	2	.....	66
Negro	3	5	9	7	7	45	13	89
Persian	.....	1	2	.....	1	.....	.....	4
Polish	362	432	615	586	297	25	5	2,322
Portuguese	4	2	1	1	1	4	5	18
Roumanian	33	65	77	102	20	6	2	305
Russian	84	79	120	134	134	9	11	571
Ruthenian	418	855	1,356	1,837	1,509	3	.....	5,978
Scandinavian—								
Danish	21	22	40	49	71	22	4	229
Icelandic	6	.....	3	.....	.....	.....	.....	9
Norwegian	31	25	27	21	40	21	14	179
Swedish	26	16	47	15	13	6	1	124
Serbian	29	35	83	70	17	7	.....	241
Slovak	432	520	1,249	1,450	206	5	2	3,864
Spanish	6	10	14	6	9	19	5	69
Spanish American	.....	.....	3	.....	.....	2	2	7
Swiss	32	49	87	75	49	12	15	319
Syrian	26	19	15	18	14	1	2	95
Turkish	.....	1	1	.....	.....	.....	.....	2
Total, Continental, etc	3,933	4,646	7,030	8,092	6,891	949	372	31,913
From the United States	5,121	5,113	5,643	5,663	5,748	7,443	6,311	41,042
Total immigration	11,103	12,023	15,645	17,128	16,205	11,496	8,865	92,465

TABLE

Immigration to Canada, by Origins, via Ocean Ports, and from

—	1932-33			1933-34			1934-35			1935-36		
	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	1,940	4,153	6,093	1,375	2,623	3,998	1,380	2,053	3,433	1,286	1,744	3,030
Irish	323	1,512	1,835	283	905	1,188	291	727	1,018	249	626	875
Scotch	764	1,747	2,511	547	1,038	1,585	472	734	1,206	484	677	1,161
Welsh	70	92	162	55	77	132	55	55	110	30	56	86
Totals	3,097	7,504	10,601	2,260	4,643	6,903	2,198	3,569	5,767	2,049	3,103	5,152
Belgian	37	42	79	41	23	64	61	18	79	72	9	81
Danish	55	53	108	43	47	90	21	28	49	21	33	54
Dutch	33	226	259	27	137	164	44	104	148	111	97	208
Finnish	30	29	59	51	16	67	59	21	80	43	24	67
French	88	2,702	2,790	74	1,130	1,204	86	809	895	95	724	819
German	518	1,180	1,698	401	755	1,156	301	656	957	209	471	680
Icelandic	1	6	7	.....	10	10	1	12	13	6	6	12
Norwegian	44	218	262	31	108	139	37	93	130	31	94	125
Swedish	17	165	182	19	110	129	10	83	93	26	89	115
Swiss	17	41	58	19	30	49	22	21	43	32	18	50
Totals	840	4,662	5,502	706	2,366	3,072	642	1,845	2,487	646	1,565	2,211
Albanian	.....	.....	.....	1	.....	1	3	.....	3	1	.....	1
Arabian	2	.....	2	.....	.....	.....	1	.....	1	.....	2	2
Armenian	1	4	5	7	3	10	1	4	5	4	1	5
Bohemian	7	16	23	.....	10	10	.....	9	9	1	6	7
Bulgarian	3	5	8	12	2	14	5	.....	5	22	2	24
Chinese	1	.....	1	2	.....	2	.....	.....	.....	.....	.....	.....
Croatian	96	4	100	108	6	114	155	.....	155	157	.....	157
Czech	65	7	72	52	7	59	77	4	81	106	1	107
Dalmatian	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Indian	62	1	63	33	.....	33	33	.....	33	20	1	21
Esthonian	.....	1	1	2	2	4	2	.....	2	2	.....	2
Greek	37	32	69	34	26	60	35	17	52	53	19	72
Hebrew	346	426	772	599	344	943	335	289	624	655	225	880
Italian	255	142	397	267	109	376	325	56	381	341	49	390
Japanese	115	.....	115	104	1	105	93	.....	93	83	.....	83
Jugo-Slavian	56	11	67	63	3	66	120	2	122	106	3	109
Lettish	.....	4	4	4	.....	4	.....	.....	.....	3	.....	3
Lithuanian	57	6	63	37	2	39	37	5	42	22	3	25
Magyar	364	20	384	509	18	527	362	20	382	314	22	336
Maltese	2	4	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexican	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Montenegrin	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moravian	3	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Negro	9	60	69	19	57	76	5	16	21	3	20	23
North American Indian	.....	20	20	.....	8	8	.....	6	6	.....	2	2
Persian	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Polish	360	99	459	374	50	424	406	40	446	362	42	404
Portuguese	1	6	7	2	4	6	2	3	5	4	3	7
Roumanian	26	11	37	27	7	34	52	5	57	33	4	37
Russian	62	35	97	61	16	77	60	25	85	84	13	97
Ruthenian	414	47	461	421	8	429	586	15	601	418	8	426
Serbian	26	18	44	37	10	47	26	3	29	29	.....	29
Slovak	252	8	260	395	6	401	595	12	607	432	11	443
Spanish	7	16	23	7	6	13	7	7	14	6	5	11
Spanish American	.....	1	1	4	.....	4	.....	.....	.....	.....	.....	.....
Syrian	19	26	45	14	26	40	13	7	20	26	10	36
Turkish	.....	.....	.....	2	.....	2	.....	1	1	.....	.....	.....
Totals	2,649	1,030	3,679	3,197	731	3,928	3,336	546	3,882	3,287	453	3,740
Grand Totals	6,586	13,196	19,782	6,163	7,740	13,903	6,176	5,960	12,136	5,982	5,121	11,103

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the United States, for the Period April 1, 1932, to March 31, 1942

1936–37			1937–38			1938–39			1939–40			1940–41			1941–42		
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
1,445	1,738	3,183	1,949	1,870	3,819	2,247	1,824	4,071	2,489	1,878	4,367	2,408	2,841	5,249	1,852	2,234	4,086
262	617	879	364	686	1,050	387	726	1,113	375	710	1,085	235	953	1,188	122	926	1,048
519	639	1,158	604	737	1,341	665	707	1,372	643	702	1,345	406	1,013	1,419	179	888	1,067
38	69	107	55	48	103	74	60	134	59	75	134	55	91	146	29	88	117
2,264	3,063	5,327	2,972	3,341	6,313	3,373	3,317	6,690	3,566	3,365	6,931	3,104	4,898	8,002	2,182	4,136	6,318
93	13	106	123	22	145	187	15	202	100	23	123	30	20	50	10	17	27
22	44	66	40	43	83	49	34	83	71	39	110	22	63	85	4	42	46
90	102	192	119	113	232	237	139	376	264	147	411	51	187	238	11	192	203
49	16	65	79	14	93	58	14	72	57	20	77	2	30	32	1	18	19
135	711	846	134	774	908	138	860	998	152	794	946	129	849	978	104	632	736
367	529	896	523	571	1,094	586	507	1,093	1,021	510	1,531	39	359	398	23	371	394
.....	2	2	3	5	8	.....	8	8	.....	4	4	.....	4	4	.....	5	5
25	74	99	27	91	118	21	84	105	40	89	129	21	79	100	14	96	110
16	73	89	47	95	142	15	90	105	13	80	93	6	117	123	1	72	73
49	16	65	87	18	105	75	22	97	49	32	81	12	42	54	15	36	51
846	1,580	2,426	1,182	1,746	2,928	1,366	1,773	3,139	1,767	1,738	3,505	312	1,750	2,062	183	1,481	1,664
4	.....	4	8	1	9	10	.....	10	4	.....	4	.....	.....	.....	.....	.....	.....
.....	.....	.....	4	.....	4	4	2	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	1	4	4	3	7	5	1	6	2	1	3	2	3	5	.....	.....	.....
1	13	14	5	6	11	2	10	12	332	9	341	3	12	15	.....	11	11
18	1	19	28	2	30	29	.....	29	15	.....	15	1	1	2	.....	.....	.....
1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
240	.....	240	277	4	281	265	3	268	106	2	108	7	6	13	.....	3	3
134	4	138	188	3	191	169	4	173	290	3	293	49	18	67	17	10	27
1	.....	1	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
13	.....	13	14	.....	14	14	.....	14	11	.....	11	6	.....	6	3	.....	3
5	.....	5	2	1	3	12	.....	12	3	1	4	1	.....	1	1	.....	1
75	20	95	115	11	126	127	10	137	115	10	125	26	20	46	3	27	30
391	228	619	317	267	584	621	269	890	1,321	302	1,623	284	342	626	111	277	388
299	58	357	408	69	477	365	58	423	186	64	250	43	85	128	1	66	67
103	.....	103	139	.....	139	46	.....	46	36	.....	36	44	1	45	1	.....	1
106	3	109	116	9	125	250	3	253	55	6	61	1	6	7	.....	5	5
2	3	5	11	.....	11	4	.....	4	3	2	5	1	6	7	.....	2	2
42	10	52	37	6	43	39	6	45	49	5	54	6	8	14	.....	4	4
328	11	339	622	24	646	532	22	554	329	37	366	35	21	56	4	29	33
4	1	5	2	.....	2	1	5	6	.....	.....	.....	.....	4	4	1	.....	1
6	.....	6	1	.....	1	2	.....	2	.....	.....	.....	.....	.....	.....	.....	2	2
.....	.....	.....	2	.....	2	8	.....	8	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	3	.....	3	9	.....	9	52	.....	52	2	.....	2	.....	.....	.....
5	17	22	9	17	26	7	24	31	7	22	29	45	30	75	13	31	44
.....	2	2	.....	11	11	.....	13	13	.....	4	4	.....	16	16	.....	15	15
1	.....	1	2	1	3	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....
432	35	467	615	46	661	586	68	654	297	51	348	25	100	125	5	102	107
2	.....	2	1	2	3	1	2	3	1	3	4	4	2	6	5	4	9
65	2	67	77	11	88	102	2	104	20	8	28	6	4	10	2	5	7
79	19	98	120	22	142	134	14	148	134	47	181	9	31	40	11	35	46
855	15	870	1,356	13	1,369	1,837	19	1,856	1,509	16	1,525	3	19	22	.....	19	19
35	3	38	83	4	87	70	5	75	17	4	21	7	5	12	.....	9	9
520	7	527	1,249	13	1,262	1,450	19	1,469	206	22	228	5	23	28	2	20	22
10	11	21	14	2	16	6	4	10	9	10	19	19	14	33	5	7	12
.....	1	1	3	.....	3	.....	.....	.....	.....	1	1	2	2	4	2	4	6
19	5	24	15	8	23	18	10	28	14	15	29	1	16	17	2	7	9
1	.....	1	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3,800	470	4,270	5,848	556	6,404	6,726	573	7,299	5,124	645	5,769	637	795	1,432	189	694	883
6,910	5,113	12,023	10,002	5,643	15,645	11,465	5,663	17,128	10,457	5,748	16,205	4,053	7,443	11,496	2,554	6,311	8,865

TABLE 9

Immigration via Ocean Ports, Showing Country of Birth by Racial Origin, for the Fiscal Year 1941-42

Country of Birth	Totals	Slovak	Hebrew	English	Irish	Scotch	Welsh	Spanish American	Belgian	Czech	Finnish	French	German	Greek	Dutch	Magyar	Italian	Polish	Roumanian	Russian	Danish	Norwegian	Swedish	Swiss	Esthonian	Maltese	Portuguese	Spanish	Negro	East Indian	Japanese	Syrian
Africa (British)	8			6		2																										
Argentine	7			4									2									1										
Atlantic Ocean Is. (British)	1											1																				
Australia	25			16	4	2						3																				
Atlantic Ocean Is. (Not British)	1																										1					
Austria	5		3										2																			
Barbados	6			2	1								2																1			
Bahamas	9			9																												
Belgium	14		5						6			2																1				
Bermuda	10			6		1															1						2					
Brazil	13			5		1	2						4														1					
Canada	1											1																				
Central America	5		1	4																								1				
Chili	2					1																										
China	72		3	47	6	9	1						1		1			2		2												
Cuba	4			3																									1			
Czecho-Slovakia	25	2	6							16									1													
Denmark	1																				1											
East Indies (Dutch)	1														1																	
Ecuador	1							1																								
Egypt	1			1																												
Eire	18		2	2	10	1						3																				
England	436		5	398	1	24	4													1				1				2				
Esthonia	1																								1							
Finland	1										1																					
France	36			3	2	1						30																				
Germany	34		23						2				9																			
Greece	2													2																		
Guiana (British)	5			4		1																										
Hawaiian Islands	1					1																										
Holland	13		11												2																	
Honduras (British)	3			3																												
Hong Kong	11			7	3	1																										
Hungary	9		5													4																
India (British)	19			8	1	7																								3		
Ireland (Northern)	9			1	6	2																										
Italy	4			1								1					1									1						
Jamaica	22		1	10	2		1					1	1															5				1
Japan	26			22		1							1														1			1		
Java	4			1		1									2																	
Jugo-Slavia	2		2																													
Korea	3			2		1																										

Latvia	1		1																												
Lesser British Isles	1			1																											
Luxemburg	6		5						1																						
Lithuania	8		8																												
Malta	1			1																											
Mexico	8			6	2																										
Newfoundland	1,359		2	1,193	74	35	4				48									2							1				
New Zealand	26			15	2	8			1												13										
Norway	13																														
Palestine	1		1																												
Peru	7			7																											
Philippine Islands	1			1																											
Poland	22		18							1								3													
Porto Rico	1					1																									
Portugal	1										1																				
Roumania	5		4																1												
Russia	14		3	2															8			1									
Siam	1			1																											
St. Pierre and Miquelon	14			1	2						11																				
Scotland	78			7	3	67	1																								
South America	2			1				1																							
Spain	1			1																											
Straits Settlements	2			1		1									4																
Sumatra	4																														
Sweden	2			2																											
Switzerland	20		2	2							1			1									14							1
Syria	1																											1			
Trinidad	16			13		2							1																		
Turkey	2			1																											
United States	20			11	3	4					1	1																			
Uruguay	1			1																											
Wales	21			6			15																								
Venezuela	2			2																											
West Indies (British)	21			11		4	1																				5				
Totals	2,554	2	111	1,852	122	179	29	2	10	17	1	104	23	3	11	4	1	5	2	11	4	14	1	15	1	1	5	5	13	3	1	2

TABLE 10

Immigration from the United States, Showing Country of Birth by Racial Origin, for the Fiscal Year 1941-42

Country of Birth	Totals	Bohemian	Slovak	Hebrew	English	Irish	Scotch	Welsh	N.A. Indian	Mexican	Spanish American	Croatian	Serbian	Belgian	Czech	Finnish	French	German	Greek	Dutch	Magyar	Italian	Jugo-Slavian	Polish	Roumanian	Russian	Danish	Icelandic	Norwegian	Swedish	Swiss	Ruthenian	Lettish	Lithuanian	Portuguese	Spanish	Negro	Syrian
Africa (British)	7				6	1																															
Africa (not British)	1				1																																
Argentine	1				1																																
Atlantic Ocean Is. (British)	2				1														1																		
Australia	9				5		3																									1					
Austria	3			3																																	
Bahamas	2					1	1																														
Belgium	15			1										14																							
Bermuda	1			1																																	
Brazil	1				1																																
Canada	421		2	8	143	61	93	3									74	13		12		1		4		2			1	1		2					
Central America, N.E.S.	1										1																										
China	9				6		2											1																			
Cuba	1			1																																	
Czecho-Slovakia	8		2	1											4			1																			
Danzig	1																	1																			
Denmark	10																										10										
Eire	40				1	35	4																														
England	408			12	354	18	17	2												2		1									2						
Finland	3															3																					
France	26				3	1											21			1																	
Germany	18			2														13						1							1	1					
Greece	6																		6																		
Guiana (British)	5				2		2										1																				
Hawaiian Islands	2				2																																
Holland	2																			2																	
Honduras (British)	1					1																															
Hungary	14			4														1			8					1										
Iceland	1																											1									
India (British)	8				4	1	3																														
Ireland (Northern)	37				4	31	2																														
Italy	9				1																	8														
Jamaica	3																																			3	
Japan	3				2		1																														
Jugo-Slavia	7		1	1										3				1			1															
Latvia	1			1																																	
Lesser British Isles	3				2												1																				
Lithuania	3			2																													1				
Mexico	2				2																																
Newfoundland	22			1	12	4	5																														
New Zealand	4				3		1																														
Norway	15					1																							14								

Peru	2	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Philippine Islands	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Poland	41	...	...	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17	...	1	...	...	...	...	...	3	...	...	...	...	...	...
Porto Rico	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Portugal	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Roumania	9	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...
Russia	40	...	...	23	1	...	...	...	...	...	...	...	...	...	...	...	...	3	...	1	...	...	...	1	...	10	1	...	...	...	...	...	...	...	...	...	...	...
Scotland	198	...	...	...	3	3	192	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
South America	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Spain	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sweden	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	5	...	...	...	...	...	...	...	...
Switzerland	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	4	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...
Syria	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Turkey	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
United States	4,841	11	15	191	1,666	767	558	68	15	2	2	3	6	3	6	15	534	332	20	174	20	55	5	79	1	21	31	4	80	66	31	13	1	3	4	7	26	6
Wales	22	...	...	...	4	1	2	15		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
West Indies (British)	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Totals	6,311	11	20	277	2,234	926	888	88	15	2	4	3	9	17	10	18	632	371	27	192	29	66	5	102	5	35	42	5	96	72	36	19	2	4	4	7	31	7

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
Belgian	2	5	1	2	10	.....	.....	.....	.....	.....	.....	.....	.....	.....
British—														
English	593	809	200	250	1,852	17	3	2	181	8	14	126	32	25
Irish	40	57	10	15	122	1	.....	3	9	1	.....	6	.....	1
Scotch	53	65	28	33	179	3	2	.....	3	.....	.....	11	1	1
Welsh	5	17	5	2	29	.....	.....	.....	.....	.....	.....	1	1	1
Czech	6	8	3	.....	17	2	2	.....	.....	.....	.....	1	1	1
Dutch	3	3	2	3	11	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Indian	.....	.....	3	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Esthonian	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Finnish	1	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....
French	27	41	17	19	104	2	.....	1	6	1	.....	3	1	1
German	6	8	3	6	23	1	1	.....	.....	.....	.....	2	2	.....
Greek	3	.....	.....	.....	3	.....	.....	.....	1	.....	.....	.....	.....	.....
Hebrew	40	40	17	14	111	6	5	4	1	1	.....	13	7	6
Italian	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Japanese	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Magyar	1	.....	3	.....	4	.....	.....	.....	.....	.....	.....	1	.....	.....
Maltese	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Negro	10	3	.....	.....	13	.....	.....	.....	1	.....	.....	.....	.....	.....
Polish	1	3	.....	1	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese	2	2	.....	1	5	.....	.....	.....	2	.....	1	.....	.....	.....
Roumanian	1	1	.....	.....	2	.....	.....	.....	.....	.....	.....	1	.....	.....
Russian	2	7	2	.....	11	.....	1	.....	.....	.....	.....	.....	2	.....
Scandinavian—														
Danish	2	1	.....	1	4	.....	.....	.....	.....	.....	.....	1	.....	.....
Norwegian	9	5	.....	.....	14	1	.....	.....	6	1	.....	2	.....	.....
Swedish	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Slovak	1	1	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish	2	3	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish American	1	1	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Swiss	3	5	4	3	15	.....	.....	.....	.....	.....	.....	.....	.....	.....
Syrian	.....	2	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	814	1,091	298	351	2,554	34	14	10	210	12	15	168	47	36

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at Ocean Ports, for the Fiscal Year Ended March 31, 1942

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	Northwest Territories
1	2	....	....	....	....	.....	.....	1	3	3	1	....	.....	6	3	.....	.....	.....	.....	.....
67	51	20	10	2	1	369	74	192	344	314	794	34	5	253	506	22	14	25	197	2
2	4	....	1	....	....	26	2	21	26	19	62	2	1	21	18	1	1	1	15	.....
12	14	5	....	....	....	7	2	24	41	53	27	6	.....	24	66	10	2	8	36	.....
1	3	3	....	....	....	1	.....	3	12	3	6	....	.....	4	13	1	...	.....	5	.....
2	1	2	....	....	....	.....	.....	1	4	.....	....	....	.....	14	2	.....	.....	.....	1	.....
1	....	....	....	....	....	.....	.....	2	3	5	....	....	.....	.....	1	.....	.....	.....	10	.....
.....	....	....	....	....	....	.....	.....	.....	.....	3	....	....	.....	.....	.....	.....	.....	.....	3	.....
.....	1	....	....	....	....	.....	.....	.....	.....	.....	....	....	.....	1	.....	.....	.....	.....	.....	.....
.....	....	....	....	....	....	.....	.....	.....	.....	.....	....	....	.....	.....	1	.....	.....	.....	.....	.....
6	3	6	....	....	....	11	1	10	25	27	27	12	.....	55	7	1	.....	.....	2	.....
.....	....	....	....	....	....	.....	.....	3	5	9	....	....	.....	4	13	.....	4	1	1	.....
1	....	....	....	....	....	.....	.....	1	.....	.....	1	....	.....	1	.....	.....	.....	.....	1	.....
12	7	9	....	....	....	.....	.....	8	20	12	2	....	.....	62	44	.....	.....	.....	3	.....
.....	....	....	....	....	....	.....	.....	.....	1	.....	....	....	.....	.....	1	.....	.....	.....	.....	.....
.....	....	....	....	....	....	.....	.....	.....	1	....	..	....	.....	.....	.....	.....	.....	.....	1	.....
.....	....	....	....	....	....	.....	.....	.....	.....	3	..	....	.....	1	.....	.....	.....	.....	3	.....
.....	....	....	....	....	....	.....	.....	.....	.....	1	....	....	.....	.....	1	.....	.....	.....	.....	.....
1	....	....	....	....	....	1	.....	8	2	.....	1	....	.....	9	1	1	.....	.....	1	.....
.....	....	1	....	....	....	.....	.....	1	3	.....	....	....	.....	2	1	.....	.....	.....	2	.....
.....	1	....	....	....	....	.....	.....	.....	1	.....	1	....	.....	.....	2	.....	.....	.....	2	.....
.....	....	....	....	....	....	.....	.....	.....	1	.....	1	..	.....	1	.....	.....	.....	.....	.....	.....
.....	1	....	....	....	....	.....	.....	2	3	2	....	....	.....	3	1	.....	.....	.....	7	.....
.....	....	..	....	....	....	1	1	1	.....	.....	....	....	.....	2	2	.....	.....	.....	.....	.....
.....	1	....	....	....	....	2	.....	.....	1	.....	1	....	.....	2	2	.....	.....	.....	9	.....
.....	....	....	....	....	....	.....	.....	.....	1	.....	....	....	.....	.....	.....	.....	.....	.....	1	.....
.....	....	....	....	....	....	.....	.....	1	1	.....	....	....	.....	2	.....	.....	.....	.....	.....	.....
.....	1	....	....	....	....	.....	.....	2	2	.....	....	....	.....	2	2	.....	1.	.....	.....	.....
1	....	....	....	....	....	.....	.....	.....	1	.....	....	....	.....	.....	1	.....	.....	.....	1	.....
.....	1	....	....	....	....	1	.....	3	3	7	....	....	.....	13	.....	1.	.....	.....	1	.....
.....	....	....	....	....	....	.....	.....	.....	2	.....	1	....	.....	.....	1	.....	.....	.....	.....	.....
107	91	46	11	2	1	419	80	284	506	461	925	54	6	482	689	37	22	35	302	2

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
Belgian	9	6	1	1	17	2	.....	.....	1	.....	.....	3	1	.....
Bohemian	4	7	.....	.....	11	.....	.....	.....	1	.....	.....	1	.....	.....
British—														
English	992	764	241	237	2,234	52	24	22	44	15	16	131	48	23
Irish	407	288	112	119	926	13	9	10	23	4	1	43	12	11
Scotch	408	310	85	85	888	27	5	1	27	5	13	67	13	8
Welsh	50	26	7	5	88	7	1	.....	4	1	2	9	4	2
Croatian	.....	3	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Czech	6	3	.....	1	10	.....	.....	.....	1	.....	1	.....	.....	.....
Dutch	96	71	6	19	192	1	3	.....	1	.....	.....	14	3	.....
Finnish	7	10	.....	1	18	.....	.....	.....	.....	.....	.....	.....	1	.....
French	209	245	85	93	632	27	4	10	12	6	1	34	10	8
German	153	161	25	32	371	14	4	4	3	3	6	21	12	4
Greek	16	6	2	3	27	.....	.....	.....	.....	.....	.....	1	.....	.....
Hebrew	115	112	24	26	277	1	1	1	.....	.....	.....	13	2	3
Italian	33	24	6	3	66	1	.....	.....	1	.....	.....	9	.....	.....
Jugo-Slavian	3	2	.....	.....	5	.....	.....	.....	.....	.....	.....	1	.....	.....
Lettish	2	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lithuanian	4	.....	.....	.....	4	.....	.....	.....	1	.....	.....	.....	.....	.....
Magyar	8	20	.....	1	29	.....	.....	.....	1	1	.....	3	1	.....
Mexican	1	1	.....	.....	2	.....	.....	.....	1	.....	.....	.....	.....	.....
Negro	11	15	3	2	31	.....	.....	.....	4	.....	.....	1	1	.....
North American Indian	2	4	2	7	15	.....	.....	.....	.....	.....	.....	.....	.....	.....
Polish	37	55	6	4	102	1	1	.....	2	2	.....	10	1	4
Portuguese	3	1	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
Roumanian	3	2	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russian	21	10	1	3	35	1	.....	.....	.....	.....	.....	5	.....	.....
Ruthenian	4	9	2	4	19	2	1	2	.....	.....	1	.....	.....	.....
Scandinavian—														
Danish	25	13	.....	4	42	4	1	.....	.....	.....	1	4	.....	.....
Icelandic	3	1	.....	1	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norwegian	42	41	12	1	96	9	4	3	4	.....	.....	.....	1	.....
Swedish	35	22	5	10	72	2	1	.....	.....	.....	.....	7	.....	.....
Serbian	.....	6	1	2	9	.....	.....	.....	.....	.....	.....	.....	.....	.....
Slovak	11	8	.....	1	20	.....	1	.....	1	.....	1	4	.....	.....
Spanish	5	2	.....	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish American	2	2	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
Swiss	20	10	3	3	36	2	.....	.....	.....	.....	.....	5	.....	1
Syrian	1	6	.....	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	2,748	2,266	629	668	6,311	166	60	53	132	37	43	386	110	64

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from the United States, for the Fiscal Year ended March 31, 1942

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	....	....	....	....	.....	.....	2	4	2	....	....	....	5	8	1	....	1	2	....
.....	.....	....	....	....	....	1	.....	2	6	.....	....	....	....	.....	5	2	2	1	1	....
92	70	40	1	....	....	49	3	672	558	374	138	129	16	337	968	42	32	74	498	....
37	36	15	4	....	....	9	1	287	218	193	28	56	6	174	393	30	13	33	192	1
35	28	3	2	1	....	29	.....	250	229	145	62	49	10	102	388	27	16	36	198	....
3	1	....	....	1	....	1	.....	27	17	8	1	....	....	7	39	4	5	2	30	....
.....	.....	....	....	....	....	.....	.....	.....	3	.....	....	....	....	.....	3	.....	.....	.....	.....	....
1	1	....	....	....	....	.....	.....	4	2	.....	....	1	....	5	1	.....	.....	.....	3	....
13	5	1	....	....	....	1	.....	67	59	24	8	4	....	36	86	4	4	17	33	....
2	1	....	....	....	....	.....	.....	5	8	1	....	....	....	.....	12	.....	1	1	4	....
16	19	6	....	....	....	13	3	120	193	150	17	41	4	345	125	8	8	19	65	....
15	11	3	2	....	1	4	.....	98	127	39	12	4	....	54	161	5	21	32	82	....
3	....	1	....	....	....	.....	.....	12	6	4	3	....	....	11	11	.....	.....	.....	2	....
48	15	8	....	....	....	3	.....	53	91	38	13	2	....	126	109	6	5	.....	16	....
1	3	....	....	....	....	1	.....	21	20	9	....	....	....	21	36	2	.....	.....	7	....
.....	.....	....	....	....	....	.....	.....	2	2	.....	1	....	....	1	2	.....	.....	.....	1	....
.....	.....	....	....	....	....	.....	.....	2	.....	.....	....	....	....	.....	.....	.....	.....	.....	2	....
1	....	....	....	....	....	.....	.....	2	.....	.....	1	....	....	3	.....	.....	.....	.....	.....	....
.....	2	....	....	....	....	.....	1	4	16	.....	1	....	....	7	19	.....	2	.....	.....	....
.....	1	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	1	1	.....	.....	.....	.....	....
1	....	1	....	....	....	1	.....	5	13	4	1	....	....	11	17	1	.....	.....	1	....
.....	.....	....	....	....	....	.....	.....	2	4	9	1	2	....	1	7	2	.....	.....	2	....
1	2	....	....	....	....	2	.....	23	47	6	2	....	....	19	61	7	.....	2	11	....
.....	.....	....	....	....	....	.....	.....	3	1	.....	....	....	....	1	1	.....	.....	.....	2	....
.....	.....	....	....	....	....	.....	.....	3	2	.....	....	....	....	4	1	.....	.....	.....	.....	....
1	2	....	....	....	....	.....	.....	14	8	4	....	2	....	7	6	4	2	1	13	....
1	....	....	....	....	....	.....	.....	1	8	3	....	....	....	4	8	6	.....	1	.....	....
2	1	....	....	....	....	.....	.....	15	11	3	....	1	....	8	14	2	1	4	12	....
.....	.....	....	....	....	....	.....	.....	3	1	1	....	....	....	.....	.....	2	1	11	1	....
2	2	....	....	....	....	.....	.....	27	34	10	1	1	....	7	19	5	23	7	22	1
1	1	....	....	....	....	.....	.....	25	20	15	4	4	....	6	21	5	10	4	18	....
.....	1	1	....	....	....	.....	.....	.....	5	2	....	....	....	.....	9	.....	.....	.....	.....	....
1	....	....	....	....	....	1	.....	5	6	.....	1	....	....	3	14	.....	.....	1	1	....
.....	.....	....	....	....	....	.....	.....	5	2	.....	1	....	....	2	1	.....	.....	.....	3	....
.....	.....	....	....	....	....	.....	.....	2	2	.....	....	1	....	1	.....	.....	.....	.....	2	....
1	1	....	....	....	....	.....	.....	12	9	5	....	....	....	6	16	1	2	2	9	....
.....	.....	....	....	....	....	.....	.....	1	6	.....	1	....	....	2	4	.....	.....	.....	.....	....
279	204	79	9	2	1	115	8	1,776	1,738	1,049	297	297	36	1,317	2,566	166	148	249	1,233	2

TABLE 13

Immigration, Showing Nationality and Sex, for the Fiscal Year Ended March 31, 1942

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.	
Belgium	5	1	3	.....	1	5	1	3	1	.....	10
British	2,353	735	1,019	268	331	1,180	418	616	75	71	3,533
Central American	.....	.....	.....	.....	.....	1	1	.....	.....	.....	1
Chilian	2	1	1	.....	.....	.....	.....	.....	.....	.....	2
Columbian	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Czecho-Slovakian	28	12	12	3	1	6	3	2	.....	1	34
Danish	1	.....	1	.....	.....	5	2	3	.....	.....	6
Dutch	23	7	8	5	3	3	2	1	.....	.....	26
Finnish	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1
French	28	11	11	4	2	9	4	5	.....	.....	37
German	23	12	9	1	1	3	1	2	.....	.....	26
Greek	3	3	.....	.....	.....	1	1	.....	.....	.....	4
Hungarian	9	3	2	3	1	2	1	1	.....	.....	11
Jugo-Slavian	.....	.....	.....	.....	.....	2	.....	2	.....	.....	2
Latvian	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Lithuanian	8	3	3	.....	2	3	1	1	1	.....	11
Luxemburg	9	2	3	3	1	.....	.....	.....	.....	.....	9
Mexican	.....	.....	.....	.....	.....	2	1	1	.....	.....	2
Norwegian	12	9	3	.....	.....	2	2	.....	.....	.....	14
Polish	18	5	6	4	3	3	1	2	.....	.....	21
Portuguese	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Roumanian	8	2	4	1	1	4	2	2	.....	.....	12
Russian	.....	.....	.....	.....	.....	2	.....	2	.....	.....	2
Ecuadorian	1	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Swiss	10	3	3	2	2	2	1	1	.....	.....	12
U.S.A. Citizens	8	.....	2	4	2	5,075	2,306	1,622	552	595	5,083
West Indian (not British)	1	1	.....	.....	.....	1	.....	.....	.....	1	2
Grand Total	2,554	814	1,091	298	351	6,311	2,748	2,266	629	668	8,865

TABLE 14

Rejections, at Ocean Ports, by Causes and Nationalities, from 1902-3 to 1941-42

	Fiscal Years																					
	1902-3 to 1912-3	1913-4 to 1922-3	1923-1924	1924-1925	1925-1926	1926-1927	1927-1928	1928-1929	1929-1930	1930-1931	1931-1932	1932-1933	1933-1934	1934-1935	1935-1936	1936-1937	1937-1938	1938-1939	1939-1940	1940-1941	1941-1942	Totals
By Causes																						
Medical causes.....	4,162	1,029	130	83	40	95	104	94	78	39	26	16	17	9	13	11	8	7	10	11	20	6,002
Civil causes.....	5,094	5,604	862	948	226	594	215	266	243	444	298	213	177	206	183	236	202	170	167	225	129	16,702
Totals.....	9,256	6,633	992	1,031	266	689	319	360	321	483	324	229	194	215	196	247	210	177	177	236	149	22,704
By Nationalities																						
British.....	1,240	978	187	199	109	209	150	154	160	251	180	126	123	150	123	138	86	94	124	95	90	4,966
American.....	175	134	6	11	.....	5	2	3	8	6	4	13	11	13	7	7	4	9	5	4	1	428
Other countries....	7,841	5,521	799	821	157	475	167	203	153	226	140	90	60	52	66	102	120	74	48	137	58	17,310
Totals.....	9,256	6,633	992	1,031	266	689	319	360	321	483	324	229	194	215	196	247	210	177	177	236	149	22,704

TABLE 15

Deportations, after having been Admitted, by Causes, Nationalities, and Provinces, from 1902-3 to 1941-42

—	Fiscal Years																				
	1902-3 to 1912-3	1913-4 to 1922-3	1923-1924	1924-1925	1925-1926	1926-1927	1927-1928	1928-1929	1929-1930	1930-1931	1931-1932	1932-1933	1933-1934	1934-1935	1935-1936	1936-1937	1937-1938	1938-1939	1939-1940	1940-1941	1941-1942	Totals
By Causes																					
Medical causes	2,296	2,213	649	420	410	470	519	650	600	789	697	476	301	144	81	47	42	36	29	12	14	10,895
Public charges	2,853	4,517	775	543	506	354	430	444	2,106	2,245	4,507	4,916	2,991	464	125	110	46	45	18	8	1	28,004
Criminality	1,083	3,989	511	520	453	447	426	441	591	868	1,006	836	493	267	207	117	101	114	110	83	69	12,732
Other civil causes	530	793	93	58	189	149	257	194	107	200	270	277	250	172	163	240	203	229	237	322	371	5,304
Accompanying deported persons	145	262	78	145	158	165	254	235	559	274	545	626	439	81	34	57	21	10	5	3	3	4,099
Totals	6,907	11,774	2,106	1,686	1,716	1,585	1,886	1,964	3,963	4,376	7,025	7,131	4,474	1,128	610	571	413	434	399	428	458	61,034
By Nationalities																					
British	4,358	5,226	1,377	985	899	808	1,047	1,083	2,983	3,099	4,248	4,251	2,718	385	157	202	134	135	127	108	135	34,465
American	1,066	4,566	417	321	330	351	297	294	228	279	260	331	319	199	146	167	138	145	147	124	107	10,232
Other countries	1,483	1,982	312	380	487	426	542	587	752	998	2,517	2,549	1,437	544	307	202	141	154	125	196	216	16,337
Totals	6,907	11,774	2,106	1,686	1,716	1,585	1,886	1,964	3,963	4,376	7,025	7,131	4,474	1,128	610	571	413	434	399	428	458	61,034
By Provinces																					
Maritime Provinces	147	409	38	32	43	48	48	70	93	148	252	244	260	62	42	61	27	40	61	136	150	2,411
Quebec	1,589	2,197	301	206	233	233	240	255	480	509	984	1,343	596	163	106	129	102	112	103	139	178	10,198
Ontario	2,896	4,243	547	675	620	581	646	600	1,115	1,788	2,828	2,626	1,827	347	167	127	123	121	96	80	82	22,135
Manitoba	.....	1,310	802	242	195	177	279	403	1,296	625	1,014	858	408	71	43	32	21	22	8	14	4	18,801
Saskatchewan	1,783	691	110	115	113	118	197	173	277	414	767	490	261	91	36	26	14	28	9	.....	1	
Alberta	.....	1,041	102	134	178	169	260	187	396	511	631	738	467	184	79	77	40	19	32	9	9	
British Columbia	491	1,876	206	282	334	259	216	276	306	381	549	832	655	210	137	119	86	92	90	50	34	7,481
Yukon Territory	1	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8
Totals	6,907	11,774	2,106	1,686	1,716	1,585	1,886	1,964	3,963	4,376	7,025	7,131	4,474	1,128	610	571	413	434	399	428	458	61,034

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

SIR,—I have the honour to submit a report of Soldier Settlement activities for the fiscal year ended March 31, 1942.

Included in this report are sections relating to the Three Thousand British Family Scheme, and the New Brunswick Five Hundred British Family Scheme, also field services performed by Soldier Settlement for other Departments of the Dominion Government.

Your obedient servant,

G. MURCHISON,
Director of Soldier Settlement.

OTTAWA, July 23, 1942.

SOLDIER SETTLEMENT OF CANADA

After twenty-three years of operation Soldier Settlement has under administration 16,766 farm properties representing a net investment of $26,704,207.55 as of March 31, 1942.

A condensed balance sheet covering loan operations since inception and schedules giving analyses by districts of the present position of loans, collections, legislative concessions, properties on hand, and debt adjustment under the Farmers' Creditors Arrangement Act are found on pages 185 to 191.

The main items to report for the fiscal year are: the best collection year since 1929-30 from the standpoint of aggregate payments received; the best collection year in the history of the department from the standpoint of numbers of settlers in all classes who have met their obligations in whole or in part and the percentage of money received in relation to current instalment due; progress towards completion of debt adjustment under the Farmers' Creditors Arrangement Act; further decrease in loan administration costs; and increase in field services directly related to the war.

Collections

Collections on account of loan and purchase contracts totalled $2,414,052.59 for the fiscal year. The substantial improvement is due to greater incentive to pay on the part of settlers and purchasers who have had their debts reduced in line with the value of their properties, improvement in prices, coupled with a firm collection policy.

Debt Adjustment under the F.C.A.A.

Annual reports in recent years have made special reference to debt adjustment under the Farmers' Creditors Arrangement Act of 1934. Debt adjustment under this measure is now practically completed. During the fiscal year a further 109 soldier settlers and other purchasers applied for debt reduction or extension of payment terms, bringing the total number of applications covering all classes of settlers and purchasers to 7,931. Boards of Review dealt with 362 cases, bringing the total of completed cases to 7,836. Debt reduction has been awarded in 6,494 cases, with aggregate reduction of $13,166,822.94.

To date 4,389 soldier settlers have applied for debt reduction or compromise and 3,455 soldier settlers have had their debts reduced an aggregate of $6,717,-634.93. The average reduction, or write-off, is $1,944 per settler, or a reduction equal to 50 per cent of their former debt.

Financial Position of Soldier Settlers

Table on page 191 shows the book debt of soldier settlers and the value of their farms by grades as at December 31, 1941. Settlers numbering 3,559, or 48 per cent, have every reasonable prospect of owning their farms outright or steadily increasing their present substantial equities: a further 1,078, or 15 per cent, have reasonable prospect of gradually increasing existing equities. The core of the Soldier Settlement problem is represented in 2,723 settlers practically all of whom have had their affairs adjusted under the provisions of the Farmers'

Creditors Arrangement Act. The majority of these settlers are located in those parts of Western Canada subject to recurrent climatic hazards and the future success of many of these men will be determined by the factors of time, production, and prices to a greater extent than in the cases of those who are farming in areas less subject to extreme hazards. The Director is of the opinion that some of the adjustments which took place under the Farmers' Creditors Arrangement Act prior to 1939 did not, and probably could not, take fully into account the deterioration which had already taken place, or, alternatively, that adverse conditions continued to exist beyond reasonable expectations. The fact that the year 1941 recorded one of the poorest grain crops in the history of a large part of Saskatchewan and Alberta lends considerable weight to this observation.

Apart from the difficulties centring in certain areas of Western Canada, it is encouraging to note that in all other parts of the Dominion the fiscal year under review recorded substantial progress and in this connection special reference is made to repayments and prepayments by settlers in response to an invitation to use this as an additional means of direct participation in Canada's war effort.

Reduced Administration Costs

Loan administration costs have been further reduced by $17,619.67 during the fiscal year.

Services Directly Related to the War

Shortly after the outbreak of war Soldier Settlement staff undertook rural investigations for the Dependents' Allowance Board and special field work for the Department of National Defence. Assignments from National Defence are given priority over all other work. During the year a further 11,545 investigations were made for the Dependents' Allowance Board, bringing the total to 20,332 as at March 31, 1942.

Loan Administration Policy

The loan administration policy of the Department can be summed up in a few words. Soldier settlers and other purchasers are expected to meet their obligations according to their contracts, and collection policy is directed to this end. Reasonable leniency is exercised in cases of crop failure or other adversities which are beyond a settler's normal control. Special attention is directed to working out practical solutions to problem cases of ageing soldier settlers, where the interests of the veterans, their families, and the state are best served by the veterans' continued occupation of rural homes.

Condensed Balance Sheet as at March 31, 1942

ASSETS

Current Loans			
Soldier Settlement:			
Soldier Settlers	$ 10,574,619 53		
Civilian Purchasers	7,426,718 10		
Indian Soldier Settlement	179,845 78		
		$ 18,181,183 41	
Less Deferred Bonus		84,570 69	
			$ 18,096,612 72
Three Thousand British Family Scheme:			
British Families	$ 2,585,481 54		
Canadian Civilians	1,128,168 48		
		$ 3,713,650 02	
Less Deferred Bonus		5,632 07	
			$ 3,708,017 95

New Brunswick 500 British Family Scheme:			
British Families	$ 182,048 19		
Canadian Civilians	70,139 44		
		$ 252,187 63	
Less Deferred Bonus		1,240 78	
			250,946 85
			$ 22,055,577 52
Security Held for Resale at Book Debt:			
Soldier Settlers	$ 2,772,339 07		
Civilian Purchasers	815,877 77		
British Families—Canadian Land	845,922 66		
		$ 4,434,139 50	
United Kingdom Government Loans		214,490 53	
			4,648,630 03
			$ 26,704,207 55

LIABILITIES

Gross Advances for Loans			
Soldier Land Settlement	$109,085,320 50		
Three Thousand British Family Scheme	13,007,943 41		
New Brunswick 500 British Family Scheme	950,607 71		
		$123,043,871 62	
Replacements		2,986,566 76	
Interest Charges		39,376,508 02	
			$165,406,946 40
Deduct			
Repayments:			
Soldier Land Settlement		$ 61,910,182 64	
Three Thousand British Family Scheme		3,460,478 85	
New Brunswick 500 British Family Scheme		194,103 25	
Replacements		2,986,566 76	
			68,551,331 50
			$ 96,855,614 90
Deduct			
Legislative Reductions:			
Soldier Land Settlement		$ 48,029,564 62	
Three Thousand British Family Scheme		7,774,925 53	
New Brunswick 500 British Family Scheme		658,717 07	
			56,463,207 22
			$ 40,392,407 68
Deduct			
Losses on Security already sold:			
Soldier Land Settlement		$ 24,806,188 51	
Three Thousand British Family Scheme		2,084,180 81	
New Brunswick 500 British Family Scheme		186,044 58	
		$ 27,076,413 90	
Less Farmers' Creditors Arrangement Act—Amounts charged back to previous settlers and shown in Legislative Reductions		3,119,104 90	
			23,957,309 00
Add			
			$ 16,435,098 68
Interest Exemption Act 1922—Not charged to settlers			10,269,108 87
Total			$ 26,704,207 55

Number of Settlers as at March 31, 1942

District	Current Loans					Security on Hand			Grand Total
	Soldier Land Settlement			British Family Settlement	Total	Soldier Land Settlement	British Family Settlement	Total	
	Soldier	Civilian	Total						
Vancouver	963	1,013	1,976	82	2,058	35	10	45	2,103
Edmonton	1,313	1,252	2,565	240	2,805	186	73	259	3,064
Calgary	1,037	559	1,596	230	1,826	85	22	107	1,933
Saskatoon	2,249	1,626	3,875	299	4,174	606	138	744	4,918
Winnipeg	648	843	1,491	132	1,623	255	74	329	1,952
Toronto	530	491	1,021	67	1,088	39	15	54	1,142
Sherbrooke	69	169	238	17	255	2	.....	2	257
Saint John	446	456	902	241	1,143	11	19	30	1,173
Indian Soldier Settlement	224	.....	224	.....	224	.....	.....	.....	224
Total	7,479	6,409	13,888	1,308	15,196	1,219	351	1,570	16,766

Financial Statement as at March 31, 1942

District	Active Loans		Security on Hand at Book Debt		Total	
	No.	Amount	No.	Amount	No.	Amount
		$ cts.		$ cts.		$ cts.
Vancouver	2,058	2,638,168 20	45	133,434 74	2,103	2,771,602 94
Edmonton	2,805	4,323,263 84	259	741,869 64	3,064	5,065,133 48
Calgary	1,826	3,080,394 96	107	309,915 88	1,933	3,390,310 84
Saskatoon	4,174	6,705,305 07	744	2,254,076 25	4,918	8,959,381 32
Winnipeg	1,623	2,329,009 96	329	1,034,616 28	1,952	3,363,626 24
Toronto	1,088	1,445,343 49	54	122,886 87	1,142	1,568,230 36
Sherbrooke	255	273,106 58	2	3,611 29	257	276,717 87
Saint John	1,143	1,081,139 64	30	48,219 08	1,173	1,129,358 72
Indian Soldier Settlement	224	179,845 78	.....	.....	224	179,845 78
Total	15,196	22,055,577 52	1,570	4,648,630 03	16,766	26,704,207 55

Farmers' Creditors Arrangement Act Applications as at March 31, 1942

District	Soldier Settlers				Civilian Settlers (Including British Civilians)				British Families				Totals		
	Number of Applications	Pending	Settled—Reduction	Settled—No Reduction	Number of Applications	Pending	Settled—Reduction	Settled—No Reduction	Number of Applications	Pending	Settled—Reduction	Settled—No Reduction	Pending	Settled	Applications
Vancouver	674	1	438	235	355	.....	271	84	98	.....	93	5	1	1,126	1,127
Edmonton	664	19	535	110	388	13	307	68	268	3	258	7	35	1,285	1,320
Calgary	737	4	637	96	212	3	174	35	256	.....	252	4	7	1,198	1,205
Saskatoon	1,340	32	1,149	159	542	16	458	68	353	2	333	18	50	2,185	2,235
Winnipeg	401	2	339	60	223	.....	170	53	149	.....	135	14	2	771	773
Toronto	340	.....	181	159	139	.....	98	41	93	.....	80	13	.....	572	572
Sherbrooke	43	.....	23	20	50	.....	38	12	21	.....	20	1	.....	114	114
Saint John	190	.....	155	35	78	.....	62	16	139	.....	125	14	.....	407	407
New Brunswick	.....	.....	.....	.....	.....	.....	.....	.....	178	.....	165	13	.....	178	178
Total	4,389	58	3,457	874	1,987	32	1,578	377	1,555	5	1,461	89	95	7,836	7,931

Farmers' Creditors Arrangement Act as at March 31, 1942

Soldier Settlers

District	Cases with Reduction	Debt	Reduction	Average Reduction	Percentage of Reduction
		$ cts.	$ cts.		
Vancouver	438	1,508,150 32	712,404 90	1,626	47·2
Edmonton	535	2,041,633 15	982,112 55	1,836	48·1
Calgary	637	2,791,935 70	1,428,055 41	2,242	51·1
Saskatoon	1,147	4,684,024 86	2,420,947 57	2,111	51·7
Winnipeg	339	1,422,572 01	794,068 22	2,342	55·8
Toronto	181	544,980 22	173,386 06	958	31·8
Sherbrooke	23	71,057 39	34,382 18	1,495	48·4
Saint John	155	382,219 07	172,278 04	1,111	45·1
Total	3,455	13,446,572 72	6,717,634 93	1,944	50·0

Civilian Settlers

Vancouver	233	774,971 76	341,377 06	1,465	44·1
Edmonton	280	916,195 08	450,423 83	1,609	49·2
Calgary	158	602,730 20	327,791 44	2,075	54·4
Saskatoon	440	1,691,247 71	951,132 49	2,162	56·2
Winnipeg	159	485,143 45	237,657 22	1,495	49·0
Toronto	83	244,397 50	101,868 48	1,227	41·7
Sherbrooke	36	112,857 01	52,815 53	1,467	46·8
Saint John	46	101,591 67	41,260 84	897	40·6
Total	1,435	4,929,134 38	2,504,326 89	1,745	50·8

British Families

Vancouver	93	407,653 24	219,590 43	2,361	53·9
Edmonton	258	1,283,450 65	729,384 68	2,827	56·8
Calgary	252	1,361,680 89	703,322 58	2,791	51·7
Saskatoon	333	1,700,806 11	1,026,599 78	3,083	60·4
Winnipeg	135	686,759 79	398,117 53	2,949	58·0
Toronto	80	338,935 13	125,899 60	1,574	37·1
Sherbrooke	20	69,714 27	34,626 89	1,731	49·7
Saint John	125	414,418 66	224,119 52	1,793	54·1
New Brunswick	165	539,195 67	295,736 10	1,792	54·8
Total	1,461	6,802,614 41	3,757,397 11	2,572	55·2

British Families—Civilians

Vancouver	38	134,128 23	57,775 46	1,520	43·1
Edmonton	27	90,975 66	34,010 74	1,260	37·4
Calgary	16	62,137 02	30,010 67	1,876	48·3
Saskatoon	18	58,983 86	27,069 11	1,504	45·9
Winnipeg	11	34,742 10	14,40[illegible] 70	1,310	41·5
Toronto	15	42,862 07	14,121 27	941	32·9
Sherbrooke	2	5,023 03	1,358 40	679	27·0
Saint John	16	23,896 93	8,710 66	544	36·5
Total	143	452,748 90	187,464 01	1,311	41·4
Grand Total	6,494	25,631,070 41	13,166,822 94	2,028	51·4

Note.—Accounts not yet adjusted by Treasury, two.

Collections—1941-42

Soldier Settlers

District	Amount Due		Total Cash Received					Total
	Instalment Due 1941	Total Due Including Arrears	Due Payments	Per Cent of Current Instalment	Per Cent of Total Due	Pre-Payments	Leases	
	$ cts.	$ cts.	$ cts.			$ cts.	$ cts.	$ cts.
Vancouver	115,728 44	188,810 62	130,173 32	112·5	66·3	57,283 83	1,698 19	189,155 34
Edmonton	194,490 87	585,555 91	154,331 25	79·4	26·4	26,224 10	12,174 61	192,729 96
Calgary	181,071 72	463,783 33	179,558 13	99·1	38·7	30,660 54	7,271 72	217,490 39
Saskatoon	318,016 73	1,146,727 68	246,527 35	77·5	21·5	37,495 24	44,748 17	328,770 76
Winnipeg	102,446 41	282,455 89	107,391 58	104·8	38·0	9,199 09	24,522 02	141,112 69
Toronto	71,256 02	105,203 31	75,586 78	106·1	71·8	34,538 21	2,815 23	112,940 22
Sherbrooke	8,843 56	16,844 66	11,065 29	125·1	65·7	6,271 91	105 00	17,442 20
Saint John	47,197 00	113,065 12	52,593 89	111·4	46·5	11,847 58	482 52	64,923 99
Total	1,039,050 75	2,902,446 52	957,227 59	92·1	33·0	213,520 50	93,817 46	1,264,565 55

Civilian Purchasers

Vancouver	121,564 66	187,538 28	148,578 39	122·2	79·2	62,161 22	.....	210,739 61
Edmonton	159,499 27	389,599 10	148,985 83	93·4	38·2	23,086 67	.....	172,072 50
Calgary	78,620 76	170,865 74	81,587 15	103·7	47·7	17,824 78	.....	99,411 93
Saskatoon	181,818 57	492,951 84	139,209 57	76·6	28·2	19,429 41	.....	158,638 98
Winnipeg	97,069 56	216,647 58	107,415 89	110·6	49·6	19,511 43	.....	126,927 32
Toronto	56,907 96	79,087 90	62,745 54	110·3	79·3	34,048 03	.....	96,793 57
Sherbrooke	20,371 52	30,394 41	23,994 47	117·8	78·9	12,124 79	.....	36,119 26
Saint John	39,574 09	72,515 43	45,923 06	116·0	63·3	14,857 92	.....	60,780 98
Total	755,426 39	1,639,600 28	758,439 90	100·4	46·3	203,044 25	.....	961,484 15

British Family Settlement

Vancouver	10,541 88	19,058 98	11,615 94	110·2	60·9	4,133 32	.....	15,749 26
Edmonton	42,971 15	115,917 96	26,851 43	62·5	23·2	7,965 59	.....	34,817 02
Calgary	38,716 32	105,312 67	31,322 15	80·9	29·7	3,842 01	.....	35,164 16
Saskatoon	43,931 64	118,740 62	23,047 68	52·4	19·4	1,651 56	.....	24,699 24
Winnipeg	22,608 49	56,133 93	19,141 34	84·7	34·1	905 74	.....	20,047 08
Toronto	13,963 23	26,109 18	12,722 54	91·1	48·7	1,010 53	.....	13,733 07
Sherbrooke	2,547 49	3,956 26	3,072 68	120·6	77·7	2,347 96	.....	5,420 64
Saint John	12,908 32	28,265 75	14,441 10	111·9	51·1	1,333 20	.....	15,774 30
New Brunswick	14,769 00	30,900 06	16,317 44	110·5	52·8	6,280 68	.....	22,598 12
Total	202,957 52	504,395 41	158,532 30	78·1	31·4	29,470 59	.....	188,002 89

Summary

Soldier Settlers	1,039,050 75	2,902,446 52	957,227 59	92·1	33·0	213,520 50	93,817 46	1,264,565 55
Civilian Purchasers	755,426 39	1,639,600 28	758,439 90	100·4	46·3	203,044 25	.....	961,484 15
British Family Settlement	202,957 52	504,395 41	158,532 30	78·1	31·4	29,470 59	.....	188,002 89
Total	1,997,434 66	5,046,442 21	1,874,199 79	94·8	37·1	446,035 34	93,817 46	2,414,052 59

Legislative Reductions as at March 31, 1942

—	Soldier Land Settlement			3,000 British Family Scheme			N.B. 500 British Family Scheme	Total all Schemes
	Soldier Settlers	Civilian Purchasers	Total	British Families	Civilian Purchasers	Total	British Families	
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Live Stock Reduction, June 27/25.—								
40%.....	2,573,036 14	.....	2,573,036 14	.....	.....	.....	.....	2,573,036 14
20%.....	354,773 85	.....	354,773 85	.....	.....	.....	.....	354,773 85
Total.....	2,927,809 99	.....	2,927,809 99	.....	.....	.....	.....	2,927,809 99
Interest Exemption, June 28/22—								
Estimated.....	10,269,108 87	.....	10,269,108 87	.....	.....	.....	.....	10,269,108 87
Land Revaluation, April 14/27—								
Principal.....	7,479,344 75	.....	7,479,344 75	.....	.....	.....	.....	7,479,344 75
30% Reduction, May 30/30—								
Principal.....	8,645,184 43	.....	8,645,184 43	1,871,272 45	.....	1,871,272 45	137,862 64	10,654,319 52
Interest.....	2,656,943 13	.....	2,656,943 13	1,439,688 34	.....	1,439,688 34	161,592 96	4,258,224 43
Total.....	11,302,127 56	.....	11,302,127 56	3,310,960 79	.....	3,310,960 79	299,455 60	14,912,543 95
Interest Remission, May 23/33.....	1,308,492 16	585,493 48	1,893,985 64	368,163 62	32,409 45	400,573 07	49,805 31	2,344,364 02
Dollar for Dollar Bonus prior to Mar. 31/38.....	2,886,930 27	1,413,996 92	4,300,927 19	316,874 72	69,061 69	385,936 41	11,798 22	4,698,661 82
Dollar for Dollar Bonus since Mar. 31/38.....	535,362 63	98,936 17	634,298 80	23,993 22	4,337 02	28,330 24	1,921 84	664,550 88
Total Dollar for Dollar Bonus—								
Principal.....	1,904,319 29	835,286 24	2,739,605 53	138,812 99	35,352 11	174,165 10	7,337 80	2,921,108 43
Interest.....	1,452,262 18	658,787 59	2,111,049 77	197,479 34	36,990 14	234,469 48	5,141 48	2,350,660 73
Deferred Bonus.....	65,711 43	18,859 26	84,570 69	4,575 61	1,056 46	5,632 07	1,240 78	91,443 54
Total.....	3,422,292 90	1,512,933 09	4,935,225 99	340,867 94	73,398 71	414,266 65	13,720 06	5,363,212 70
Farmers' Creditors Arrangement Act, July 3/34—								
Principal.....	3,459,340 16	1,402,330 57	4,861,670 73	2,266,077 07	102,771 49	2,368,848 56	222,682 12	7,453,201 41
Interest.....	3,258,294 77	1,101,996 32	4,360,291 09	1,195,583 94	84,692 52	1,280,276 46	73,053 98	5,713,621 53
Total.....	6,717,634 93	2,504,326,89	9,221,961 82	3,461,661 01	187,464 01	3,649,125 02	295,736 10	13,166,822 94
Total Legislative Reductions.....	43,426,811 16	4,602,753 46	48,029,564 62	7,481,653 36	293,272 17	7,774,925 53	658,717 07	56,463,207 22

*Field Supervisors' Annual Reports 1941-1942—Book Debt and Value of Farms by Grades**

SOLDIER SETTLERS

District	Grade 1				Grade 2				Grade 3				Grade 4				Totals All Grades			
	Number	Debt	Value	Percentage equity	Number	Debt	Value	Percentage equity	Number	Debt	Value	Percentage equity	Number	Debt	Value	Percentage equity	Number	Debt	Value	Percentage equity
		$	$			$	$			$	$			$	$			$	$	
Vancouver....	427	374,184	1,222,330	69·4	79	122,684	181,650	32·4	126	192,662	235,300	18·1	333	599,552	572,520	.....	965	1,289,082	2,211,800	41·7
Edmonton.....	650	576,033	1,886,264	69·4	108	182,376	271,824	33·0	189	370,843	445,393	16·7	409	894,062	861,069	.....	1,356	2,023,314	3,464,550	41·6
Calgary.....	355	400,908	1,157,847	65·3	107	191,789	283,696	32·4	193	380,423	454,697	16·3	399	948,540	909,067	.....	1,054	1,921,660	2,805,307	31·5
Saskatoon.....	717	669,638	2,021,925	66·8	151	274,376	401,670	31·7	343	671,236	811,095	17·2	1,057	2,377,184	2,117,750	.....	2,268	3,992,434	5,352,440	25·4
Winnipeg.....	182	176,083	451,396	61·0	73	111,689	161,611	30·9	104	175,966	206,518	14·8	290	577,307	571,687	.....	649	1,041,045	1,391,212	25·1
Toronto.....	327	305,523	942,306	67·5	35	52,101	77,405	32·7	61	114,877	139,059	17·3	119	236,585	231,711	.....	542	709,086	1,390,481	49·0
Sherbrooke...	51	43,007	131,300	67·2	4	6,717	9,900	32·1	13	19,515	23,500	16·9	4	6,870	5,900	.....	72	76,109	170,600	55·3
Saint John....	244	139,221	445,650	68·7	49	57,327	85,400	32·8	49	62,408	75,550	17·4	112	154,721	141,600	.....	454	413,677	748,200	44·7
Totals....	2,953	2,684,597	8,259,018	67·5	606	999,059	1,473,156	32·2	1,078	1,987,930	2,391,112	16·8	2,723	5,794,821	5,411,304	.....	7,360	11,466,407	17,534,590	34·6

* As at December 31, 1941.

Field Work for other Departments of Government as at March 31, 1942, and Comparisons with three preceding Fiscal Years

Class of Work	Vancouver	Edmonton	Calgary	Saskatoon	Winnipeg	Toronto	Sherbrooke	Saint John	Totals 1941-42	1940-41	1939-40	1938-39
Department of National Defence—												
Dependents' Allowance Board—Field Supervisors' Investigations	586	436	450	380	879	2,706	4	2,732	8,173	5,819	1,447	.....
Dependents' Allowance Board—Local Representatives' Investigations	320	282	152	1,605	.....	478	.....	535	3,372	1,276	245	.....
Dependents Board of Trustees—Investigations	.....	3	3	2	.....	2	.....	2	12	.....	.....	.....
Real Estate Branch—Land Appraisals	10	343	2	5	.....	.....	.....	.....	360	.....	.....	.....
Property Damage—R.C.A.F. Investigations	.....	.....	.....	2	.....	4	.....	.....	6	1	.....	.....
Department of Pensions and National Health—												
War Veterans' Allowance Board—Initial Investigations	167	99	47	96	72	225	52	98	856	1,173	2,430	4,894
War Veterans' Allowance Board—Check Investigations	897	527	157	594	394	1,618	330	541	5,058	4,504	3,993	2,747
Relief of Pensioners—Investigations	114	17	13	128	90	309	23	12	706	1,387	2,130	2,629
P.C. 7633 Investigations	5	13	11	25	17	34	3	7	115	.....	.....	.....
Canadian Pension Commission Investigations	6	15	15	54	4	1	38	.....	133	91	146	165
Department of Finance—												
Boards of Review—Farmers' Creditors Arrangement Act—Land Appraisals	.....	208	199	734	1	.....	.....	.....	1,142	1,546	3,024	2,470
Canadian Farm Loan Board—Land Appraisals	.....	.....	.....	.....	.....	4	.....	.....	4	18	26	33
Department of Mines and Resources—												
Lands, Parks and Forests Branch—Investigations	1	.....	.....	.....	.....	13	12	2	28	28	80	42
Seed Grain Lien Adjustments—Land Inspections	.....	.....	.....	121	.....	.....	.....	.....	121	74	56	66
Seed Grain—Adjustments of Liens	.....	.....	.....	243	.....	.....	.....	.....	243	178	310	427
Indian Affairs Branch—Collection Visits	.....	178	.....	102	.....	.....	.....	.....	280	270	429	258
Indian Affairs Branch—Land Inspections	.....	7	5	58	19	.....	.....	.....	89	3	.....	.....
Immigration Branch—Investigations	.....	.....	1	.....	.....	1	.....	.....	2	10	30	196
Department of Transport—												
Land Appraisals	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Secretary of State—												
Enemy Alien Estates—Investigations	1	.....	2	1	.....	5	.....	.....	9	28	14	.....
Relief Land Settlement—Investigations	.....	.....	.....	.....	.....	.....	194	.....	194	200	118	.....

NOTES.—District Superintendents Edmonton and Winnipeg were members of Committees which adjusted 114 seed grain liens in Alberta and 9 in Manitoba.

Crop reconnaissance reports were made for the P.F.A.A. in 1,500 townships in the provinces of Alberta, Saskatchewan and Manitoba.