

CANADA  
DEPARTMENT OF MINES AND RESOURCES

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RIDING MOUNTAIN  
Experiment Station

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SAGAMING, MANITOBA

REPORT

OF

LANDS, PARKS AND  
FORESTS BRANCH

FOR THE

FISCAL YEAR ENDED MARCH 31, 1944



*(Reprinted from the Annual Report of the Department of Mines and Resources  
Pages 61 to 107 inclusive.)*

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## LANDS, PARKS AND FORESTS BRANCH

ROY A. GIBSON, DIRECTOR

The outstanding developments during the year were the completion of the Alaska Highway and the delivery of oil by pipeline from Norman Wells on the Mackenzie River to Whitehorse in the Yukon Territory. These defence projects have focused a great deal of attention on the resources of the Northwest Territories and Yukon Territory and much information has been assembled, analysed, and made available to those who could use it. Government services of these territories have been carried on for years with a minimum of expense. Present circumstances should warrant rapidly increasing governmental activity of the type that would aid development along sound lines.

Considerable thought has been given to post-war needs of the services which make up this Branch and comprehensive plans, in reasonable detail, have been supplied to those agencies which have been assembling the post-war development ideas for the consideration of the Government.

Although gold production declined during the year in the Northwest Territories and in Yukon Territory as a result of the prevailing labour shortage, an awakened interest in the mining possibilities was evidenced by the oil drilling program in the Norman Wells field, resumption of activities at Great Bear Lake, and the widespread exploratory work and drilling program in the Yellowknife area. Placer gold production in the Yukon showed a decrease of approximately 50 per cent because it was only possible to man half the number of dredges operated during the previous year. However, prospecting in Yukon Territory, particularly in the country opened up by the Alaska Highway, was quite active.

The fur trade continued to provide the native population with a dependable means of livelihood. While the cycle in numbers of fur-bearing animals approached the period of lowest ebb, the considerably higher prices paid for furs more than offset the smaller catches.

Nature has been generous to Canada in providing recreational areas of great extent and variety in widely separated parts of the country, and it is important that this potential asset should be developed into an actual resource as soon as the pressure on Canada's man-power and finances occasioned by the war will permit. Preservation and promotion of the health of the people must occupy a prominent place in post-war planning.

The place which the National Parks will occupy in the field of reconstruction and the post-war world has been receiving much thought. It is recognized, for example, that Canada's National Parks are common property and that they should be readily available to all Canadians, not merely to those in good financial circumstances. The creation of additional National Parks, and the extension of the hiking trail system, with low cost shelters and eating places, should contribute to this end. After the war, great numbers of people who formerly never enjoyed paid holidays will enter the field of potential tourists. Most of these people will be in the lower income brackets and facilities should be provided to take care of them.

Services essential for the administration, maintenance, and care of national properties were maintained during the year with increasing difficulty owing to the shortage of personnel and of efficient equipment. At the commencement of the war much of our mechanical equipment had seen years of service and it has been quite impossible to effect adequate replacements under wartime condi-

tions. The difficulty of obtaining labour for necessary maintenance has been accentuated by the difference between conditions of employment on this work as compared with those prevailing in war industry and on joint defence activities. The policy has been to continue minimum essential maintenance and to protect the properties from fire. As soon as men, materials, and equipment can be released from the war effort much useful work can be done in National Parks to ensure an opportunity for our own people to take full advantage of these outstanding nationally owned areas so suited for recreation and the improvement of physical and mental fitness. Moreover, these areas are known to possess an attraction to visitors which will do much to promote the tourist industry. In the meantime, National Parks are making their contribution to the solution of problems directly associated with war conditions.

The demand for Canadian forest products continued to exceed the available supply, although forest industries spared no effort to achieve maximum production. However, in spite of the acute deficiency in man-power, output of both lumber and newsprint was only six per cent below that for 1942. Dominion Forest Service officers continued to co-operate with the various war services in meeting all technical problems relating to wood, and operations in the Forest Products Laboratories were devoted almost entirely to war work.

The forest industry is expected to occupy an important place in post-war reconstruction but a serious threat to the carrying out of forestry programs is evident because of the great shortage of trained foresters. Training programs are urgently required to qualify men for the many professional and sub-professional posts which must be filled if plans under advisement are to be carried out. Reconstruction programs associated with forestry envisage full mechanization of field operations, as returned men, accustomed to using the most modern equipment in waging war, will be satisfied with no less for the tasks of peace.

Techniques for the interpretation of aerial photographs developed in the Dominion Forest Service are being increasingly applied in the war effort. A number of the staff are giving outstanding service in this field on active service, and one of them was decorated during the past year.

The Forest Products Laboratories have played an important part in devising new uses for wood to replace shortages in other strategic materials. A better all-round utilization of all the products of our forests may be expected in the post-war period.

Common problems arising as a result of special war conditions are drawing the various units of the forest industries into closer association. This should lead to better integration of manufacturing processes after the war and effect many savings through waste reduction.

## 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. According to the 1941 census, the population of the Territories was 12,028, but this figure has since been increased by an influx of workers engaged on joint defence projects, and by military personnel.

The Commissioner of the Northwest Territories in Council has power to make ordinances for the government 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. L. Keenleyside,  
H. W. McGill, S. T. Wood

Secretary — D. L. McKeand

### WORK OF COUNCIL

Five regular and two special sessions of Council were held during the year. Assent was given to an ordinance respecting the appointment of sheriffs. Amendments were also made to the Motor Vehicle and the Fur Export Ordinances.

In addition, matters of policy were also discussed in connection with Joint Defence Projects in northwest Canada; North Pacific Planning Project; Eastern Arctic Patrol and Eskimo affairs; hospital and medical services; public welfare; Northwest Game Act and regulations; Government reindeer herds; appointment of Territorial officers and commissioners; educational services; sale of liquor; horticultural survey in Mackenzie District; transportation systems; and private commercial 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 Marriage Commissioner. The Sheriff of the Northwest Territories is also stationed at Fort Smith. The Mining Recorder, Agent of Dominion Lands, and Crown Timber Agent for the Yellowknife Mining District, which includes what was formerly known as the Great Bear Lake Mining District, is stationed at Yellowknife. The Mining Recorder for unorganized districts is located at Ottawa, and Sub-Mining Recorders are also located at Ottawa, Edmonton, Fort Simpson, Fort Norman, Aklavik, Coppermine, and Port Radium.

### MEDICAL OFFICERS

The Northwest Territories have been divided into seven medical districts and two sub-districts over which medical officers of the Department of Mines and Resources have jurisdiction. These officials have their headquarters at Fort Smith, Fort Resolution, Fort Simpson, Fort Norman, Aklavik, Port Radium, Yellowknife, Chesterfield, and Pangnirtung, and on the vessel carrying the annual Eastern Arctic Patrol. In addition, doctors are employed at various points throughout the Territories to look after the general health of those engaged in joint defence projects.

All doctors have been appointed coroners and medical health officers under the Public Health Ordinance. Some of the doctors make patrols to outlying areas and all make use of the radiotelegraph service in prescribing for those who are unable to obtain treatment at the medical centres. The Department of Pensions and National Health in Ottawa serves as a consulting agency in matters of public health and has recently started a nutritional study in the Northwest Territories. All Government medical officers in the Territories have

recourse to the medical services of the Department of Pensions and National Health in connection with complicated cases or epidemics and the desired information is asked for and obtained by radio.

A qualified medical officer accompanies the annual Eastern Arctic Patrol. In addition to serving as ship's doctor he examines and treats the natives at each port of call and submits a report of his activities together with any recommendations necessary for improvement of the medical services.

#### HOSPITALS

Twelve hospitals were in operation in the Territories during the year. Nine of these were operated by the missions of the Roman Catholic Church and the Church of England in Canada, two by mining companies at Yellowknife and Port Radium, and one by the Indian Affairs Branch at Fort Norman. The mission hospitals are situated at Fort Smith, Fort Resolution, Hay River, Fort Simpson, Aklavik (2), Rae, Chesterfield, and Pangnirtung. Hospital facilities were also provided by private enterprise at points throughout the Territories to care for those engaged on defence projects. Under a special arrangement the Northwest Territories Administration pays the mission hospitals \$2.50 per diem for the care of indigent whites, Eskimos, and half-breeds who are admitted on the recommendation of the resident medical officer. The aged and infirm are cared for in industrial homes operated in conjunction with the mission hospitals at Aklavik, Chesterfield, and Pangnirtung. These inmates are likewise admitted on the recommendation of the departmental medical officers, the missions receiving \$200 per annum for their care and maintenance. During the year the sum of \$25,199.19 was paid for the care of destitute patients in the hospitals, representing approximately 10,080 days of treatment. Thirty-one patients were accommodated in the industrial home at a total cost of \$3,895.67. Eighteen patients were treated in provincial institutions at a cost of \$7,845.51. The above figures do not include amounts paid by the Indian Affairs Branch for services to Indians only.

#### SCHOOLS

Residential and day schools are operated by the Church of England and the Roman Catholic missions. The residential schools are located at Fort Resolution, Fort Providence, and Aklavik (2), and the mission day schools are located in the principal settlements. Owing to the nomadic tendencies of the natives some of the day schools in outlying areas are only operated during certain periods of the year when the natives are in the vicinity. During the year 140 children attended the residential schools and 175 pupils attended the day schools.

In addition to the residential and day schools operated by the missions, public schools are operated at Fort Smith and Yellowknife. Grants totalling \$21,585.49 were paid to the various schools and for the maintenance of indigent children in the residential schools. Quantities of school supplies were also furnished. As the Northwest Territories Administration is responsible for the welfare of all Eskimos, arrangements have been made for the maintenance of a number of destitute children in the residential schools at Fort George, Que. School supplies are also furnished to a number of mission day schools operated within the northern portion of the Province of Quebec.

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, four Stipendiary Magistrates have been appointed.

#### LIQUOR PERMITS

The Saskatchewan Liquor Board continued as Territorial Liquor Agent under the direction of the Northwest Territories Administration. The year was marked by changing and unpredictable conditions in respect of developments in the Mackenzie District, the continuation of wartime restrictions on alcoholic beverages, adjustments in the liquor ration from time to time, and difficulties in maintaining adequate staffs for the operation of the liquor stores. There were declining sales at Yellowknife and increased business at the Fort Smith store.

The net profits from the operation of the Territorial liquor stores amounted to \$108,273.16, as compared with \$94,182.68 in 1942-43. The profits from the Yellowknife store were \$32,480.70 and from the Fort Smith store \$75,792.46. The profits from liquor sales and permit fees in the Mackenzie District, together with \$1,129.67 derived from fines under the Territorial Liquor Ordinance, were placed in the special liquor account for territorial purposes. The balance in this account as of March 31, 1944, was \$265,326.13. The revenue from fines for liquor offences under the Northwest Territories Act amounted to \$37.50, and \$102 was obtained from the sale of liquor permits issued at Ottawa.

During the fiscal year, 5,327 Class "A" annual permits were issued in the Northwest Territories. The liquor permits issued at Ottawa included 6 Class "B" permits covering sacramental wine and 53 Class "C" permits authorizing the importation of limited quantities of spirits, wine, and beer. The sales of liquor at the Territorial liquor stores during the fiscal year were approximately 4,185 gallons of spirits, 494 gallons of wine, 1,654 gallons of ale and stout, and 23,872 gallons of beer. The importation permits covered 183 gallons of spirits, 19 gallons of wine, and 6 barrels of beer.

#### LANDS AND TIMBER

*Surveyed Lands.*—Twelve settlement lots were sold and patented as follows: Fort Smith, 2; Hay River, 7; Fort Providence, 1; Fort McPherson, 1; Aklavik, 1. At Port Radium Settlement 8 surface leases are in force and at Yellowknife Settlement 179 such leases have been issued. These leases are for five-year periods.

*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 issuing of each lease is authorized by an Order in Council and the number of such leases in force is 38.

Twenty-four permits to occupy Dominion lands during the pleasure of the Department have been granted. There are 6 grazing leases in force and during the year 7 hay permits were issued under which 93 tons of hay were cut.

During the year 16 assignments affecting lands were registered in the Department.

*Timber.*—A total of 101 timber permits, exclusive of those granted in connection with timber berths, was issued, authorizing the cutting of 252,856 linear feet of timber, 227,850 feet board measure of saw-timber, 280 roof poles, and 11,011 cords of wood. Of these permits, 26 were issued free of dues to educational, religious, and charitable institutions, to settlers for domestic use, and to Government departments. Eight timber berth permits were granted.

In addition, 18 permits were granted to contractors on the Canol Project authorizing the cutting of 52,675 linear feet of building logs, 4,835,000 feet board measure of saw-timber, and 16,000 telephone poles, over and above timber required for culverts and cordwood for fuel. No dues were charged for this material.

The total revenue derived from lands, timber, grazing, and hay was \$14,199.90.

A preliminary aerial reconnaissance survey of the forests in the Upper Mackenzie River drainage basin was made during the summer by an experienced observer. The survey covered the area along the Slave and Mackenzie Rivers from Fort Smith to Wrigley, and along the Liard River between Fort Simpson and Nelson Forks. This work is to be continued.

### MINING

The outstanding development in the Territories during the year was the extensive drilling program carried out at Norman Wells and vicinity in the lower Mackenzie River Basin. This program, a part of the Canol Project, is designed to increase the production of crude oil in the Northwest Territories to meet military requirements in northwestern Canada and Alaska, and is reviewed in a subsequent section.

The transfer of men to base metal mines in other parts of Canada, the high wages offered to workers on Joint Defence Projects, and the requirements of military service, have all contributed to the labour shortage which has brought about a recession of mining activities and mineral production in the Yellowknife District. Although six mines were in operation in this district in 1941 and four in 1942, by the end of 1943 only Negus Mines, Limited, remained in production. However, considerable prospecting and staking of claims, was carried out by prospectors in the Great Bear Lake and Coppermine River areas, at Courageous Lake north of Mackay Lake, and in the immediate vicinity of Yellowknife Settlement.

The mine of Eldorado Mining and Refining, Limited, at Echo Bay on Great Bear Lake, which was temporarily closed in 1940 and re-opened in August, 1942, continued to operate, employing more than 200 men. By the end of the year the No. 1 shaft had reached a depth of 873 feet and the No. 2 shaft a depth of 140 feet. In all, nearly five miles of lateral work has been done on the seven levels of the mine. The mill has a capacity of 100 tons in 24 hours and was in full operation. The concentrate is shipped by way of Great Bear Lake and Mackenzie, Slave, and Athabaska Rivers to railhead at McMurray Alberta, to be transported to the company's refinery at Port Hope, which produces radium and uranium salts. On January 27, 1944, all properties and assets of this company were taken over by Eldorado Mining and Refining, a Crown company.

A total of 46,696 ounces of gold having a value of \$1,797,796 was produced in the Territories during the year under review, compared with a production of \$3,642,148 for the previous year. The silver produced in the same period was 10,410 ounces valued at \$5,124.84.

Altogether 204 miner's licences, 226 renewal licences, and 674 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 about 3,500 claims in good standing. Leases have been issued comprising 13,945.25 acres. The total revenue from fees payable under the Quartz Mining Regulations amounted to \$16,675.75, including \$6,330.15, collected as licence fees.

Production from the "Negus" mine for the year was 20,036 ounces of gold and 5,290 ounces of silver, compared with the previous year's production of 19,463 ounces of gold and 3,983 ounces of silver. The mine has been opened by a three-compartment vertical shaft to a depth of 1,038 feet and more than 16,433 feet of lateral work has been completed on the eight levels. An 80-ton mill is in operation.

About 170 men were employed at the "Con" and "Rycon" mines of the Consolidated Mining and Smelting Company of Canada, Limited, until August,

1943. The acute labour situation, coupled with other factors, necessitated a termination of milling operations in September. The company, however, is continuing maintenance and small scale development work with a crew of about 35 men. Maintenance of the company's power plant at Prosperous Lake, and the hospital at Yellowknife, is also being continued.

At the "Con" mine, the main shaft has a depth of 1,499 feet and 10 levels have been opened up with lateral work of more than seven miles. Up to the time that operations were suspended in September, the mill was treating more than 100 tons daily. Production for the year was 13,821 ounces of gold and 2,866 ounces of silver, compared with 40,338 ounces of gold and 11,104 ounces of silver produced during the fiscal year 1942-43.

Production at the "Rycon" mine from April 1 to the suspension of operations in September, 1943, was 1,624 ounces of gold and 351 ounces of silver, compared with 2,834 ounces of gold and 763 ounces of silver for the previous fiscal year. A 2,500-foot drive connects the "Rycon" and "Con" mines and ore from the former is hauled along this drive to a separate bin in the "Con" mill.

Production from the 100-ton mill on the Thompson-Lundmark property, up to the closing of the mine in September, amounted to 11,215 ounces of gold and 1,903 ounces of silver for the year, compared with 22,534 ounces of gold and 4,408 ounces of silver for the full year ended March 31, 1943. The main No. 2 shaft, inclined at 47 degrees, has been sunk to 834 feet on the Fraser vein. The King vein, 2,500 feet farther south, has been opened by an inclined shaft to a depth of 649 feet, and about 5,597 feet of lateral work has been done on the five levels of the mine.

*Coal.*—Two coal leases are in force comprising an area of 25 acres each.

*Petroleum and Natural Gas.*—Six petroleum and natural gas leases are in good standing, comprising in all an area of 3,279.23 acres. Revenue from this source amounted to \$1,764.23. Rentals satisfied from drilling credits totalled \$80. An area of 139,176 acres is comprised in the 58 permits issued under the special oil and gas regulations approved by Order in Council P.C. 742, dated January 28, 1943.

*Dredging.*—Two 5-mile stretches of Grizzly and Bennett Creeks are held under lease, the revenue for the year on these leases amounting to \$105.

### THE CANOL PROJECT

Activities associated with the Canol Project continued during the year. This project was inaugurated in 1942 to increase the supply of oil in the Northwest Territories for the use of armed forces in Canada and Alaska. It involves an extensive drilling program to determine the extent of the oil-producing area in the vicinity of Norman Wells in the lower Mackenzie Basin; construction of a four-inch pipeline from Norman Wells to Whitehorse, Yukon Territory; and erection of an oil refinery at Whitehorse.

The results of the drilling program carried out were very encouraging, and by the end of the fiscal year, 38 new wells had been drilled, of which 31 yielded oil in commercial quantities. The potential production of these wells is estimated to be well in excess of the capacity of the pipeline, which is rated at 3,000 barrels daily. In addition to the new wells, there are four which were producing oil prior to the inauguration of the Canol Project.

Developments during the year included the laying of the pipeline from the Mackenzie River across the Mackenzie Mountains; construction of a service road paralleling the pipeline between Camp Canol and a point on the Alaska Highway east of Whitehorse, a distance of 521 miles; and erection of a telephone line along the right of way. The laying of the pipe presented unusual engineering problems, apart from those created by the sub-Arctic climate. The pipeline climbs from an elevation of less than 300 feet above sea level to a

height of more than 5,800 feet within the first 90 miles and traverses rugged country for the greater part of the way. By the end of March, 1944, the welding and testing of the pipeline had been completed, the refinery was nearing completion, and a start had been made in pumping oil from Norman Wells.

Construction headquarters for the project were established by United States authorities at Camp Canol on the west bank of Mackenzie River opposite Norman Wells, where administrative offices, warehouses, repair and machine shops, and other buildings were erected. Landing fields were also completed at Norman Wells and Camp Canol. High pressure pumping stations are in the course of erection along the route of the pipeline, and tank storage has been provided at Norman Wells, Camp Canol, and Whitehorse.

With the object of solving the immediate problem of motor fuel supply for Yukon Territory and Alaska pending the construction of the pipeline from Norman Wells to Whitehorse, the Canol Project was supplemented early in 1943 by the construction of a gasoline pipeline from Skagway, Alaska, to Whitehorse, over which waterborne supplies are pumped. Tapping this line are secondary pipelines constructed along the route of the Alaska Highway easterly from Carcross to Watson Lake, Y.T., and northwesterly from Whitehorse to Fairbanks, Alaska.

The movement of equipment and supplies down the Mackenzie River system from Waterways, Alberta, to Norman Wells continued to be heavy, and more than 40,000 tons of freight including steel pipe, were transported during the season of navigation. In addition, a considerable volume of freight transported by winter road from railhead at Grimshaw, Alberta, to Mills Lake on Mackenzie River, was trans-shipped by water to its destination. Air services provided by commercial transportation companies to Norman Wells and Camp Canol were augmented during the year, and a considerable volume of freight and express was delivered by air.

#### 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.

**Wood Buffalo Park.**—In addition to serving as a sanctuary for buffalo, which have extended their range beyond the park boundaries in three directions, Wood Buffalo Park also functions as an important wildlife management area. Under special regulations applicable to the park area only, hunting and trapping is permissible by Indians whose hunting grounds originally were in the park area, and by a few white trappers who operated in the southern part of the park before its establishment. These hunting and trapping privileges are zealously guarded, and the park has remained a well-stocked hunting ground.

**Fur and Game.**—Forest fires ravaged important hunting grounds in the Mackenzie District during the past summer. Even in regions devoid of stands of commercial timber, forest fires have had a serious effect on the local economy, and their prevention and control are of vital importance in wildlife management. Both native and white trappers had a prosperous year. In some regions the cycle in numbers of fur-bearing animals is reaching the period of low ebb, but high prices paid for furs during the year more than offset the tendency to smaller catches.

Six fur farms were licensed to operate in the Northwest Territories during the fiscal year.

Comparative figures of the number of big game animals and birds taken during the licence years ended June 30, 1942, and 1943, and the average for the 5 years ended June 30, 1942, follow:—

|                      | Year ended June 30 |                   | 5-year average 1938-42 |
|----------------------|--------------------|-------------------|------------------------|
|                      | 1943 <sup>2</sup>  | 1942 <sup>1</sup> |                        |
| <b>Big Game—</b>     |                    |                   |                        |
| Caribou.....         | 22,362             | 19,232            | 20,143                 |
| Deer.....            | 50                 | 71                | 54                     |
| Moose.....           | 945                | 1,426             | 1,211                  |
| Sheep.....           | 20                 | 77                | 72                     |
| Goat.....            | 7                  | 0                 | 21                     |
| <b>Game Birds—</b>   |                    |                   |                        |
| Ducks.....           | 11,314             | 13,116            | 12,151                 |
| Geese.....           | 1,108              | 839               | 997                    |
| Grouse.....          | 787                | 1,340             | 670                    |
| Partridge.....       | 1,302              | 1,744             | 2,067                  |
| Prairie chicken..... | 1,467              | 2,908             | 1,904                  |
| Ptarmigan.....       | 8,264              | 9,285             | 8,528                  |

**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 1939-43 |
|---------------------------------|-----------------------------|-------------------|------------------------|
|                                 | 1944 <sup>2</sup>           | 1943 <sup>1</sup> |                        |
| <b>Hunting and Trapping—</b>    |                             |                   |                        |
| Resident.....                   | 464                         | 507               | 527                    |
| Non-resident bird licence.....  | 26                          | 28                | 17                     |
| <b>Trading and Trafficking—</b> |                             |                   |                        |
| Resident.....                   | 119                         | 119               | 121                    |
| Non-resident.....               | 4                           | 9                 | 5                      |

|  | Permits Year ended June 30 |                   | 5-year average 1939-43 |
|--|----------------------------|-------------------|------------------------|
|  | 1944 <sup>2</sup>          | 1943 <sup>1</sup> |                        |
| To establish trading posts.....            | 10                         | 20                | 19                     |
| To take mammals.....                       | 6                          | 3                 | 3                      |
| To hunt and trap in Wood Buffalo Park..... | 322                        | 334               | 337                    |
| To take migratory birds.....               | 0                          | 11                | 13                     |
| To take scientific specimens.....          | 5                          | 2                 | 6                      |
| To take quota (15) beaver.....             | 972                        | 1,486             | 1,446                  |

<sup>1</sup> These figures may differ slightly from those recorded in the Annual Report for 1942-43 because of additional returns received after that report was printed.

<sup>2</sup> Subject to revision as additional returns are received.

Revenue under Northwest Game Act for fiscal years ended March 31, 1943 and 1944 and average for 5 years 1939-43 are shown hereunder:—

|  | Fiscal Year  |              | 5-year average 1939-43 |
|--|--------------|--------------|------------------------|
|  | 1944         | 1943         |                        |
| Hunting licences.....  | \$ 1,067 80  | \$ 1,088 07  | \$ 1,249 63            |
| Trading licences.....  | 2,493 00     | 1,935 00     | 1,956 66               |
| Bird licences.....   | 140 00       | 315 00       | 137 00                 |
| Fur farm licences.....   | 12 00        | 16 00        | 20 80                  |
| Trading post permits.....  | 12 00        | 18 00        | 19 20                  |
| Sale of furs.....  | 280 90       | 1,491 69     | 929 10                 |
| Fur export tax.....  | 111,472 46   | 102,367 16   | 95,106 34              |
| Fines and forfeitures.....   | 648 90       | 425 40       | 593 65                 |
| Sub-total.....   | \$116,127 06 | \$107,656 32 |                        |
| Revenue under the Businesses, Callings, Trades and Occupations Ordinance Fiscal Year ended March 31, 1944..... | 5,309 50     | 5,893 50     |                        |
|  | \$121,436 56 | \$113,549 82 |                        |

*Infraction of Game Laws.*—There were 8 prosecutions for infraction of the game laws. Convictions were secured in all cases.

#### REINDEER

Further increases in the Government herds of reindeer in the Mackenzie Delta area were reported. The round-up returns in the summer of 1943 in respect of the main herd on the reindeer reserve immediately east of the delta showed a total of 6,057 animals. The two herds under native management near the Anderson and Horton Rivers were estimated to contain 3,174 deer, making a total of 9,231 head in the three herds, including over 2,000 fawns.

The slaughter of surplus stock from the main herd took place in September and November, 1943 and March, 1944, with occasional slaughters from time to time for immediate needs. About 500 deer from this herd were taken for meat during the fiscal year. One hundred carcasses were allotted to the mission hospitals and residential schools in the district. The revenue from the sale of reindeer products from the main herd amounted to \$6,707.60.

The main problem affecting the reindeer industry is a shortage of suitable help for effective supervision and herding, and for the establishment of additional herds under native management. This is attributed to wartime conditions and the continued good fur yield with high prices in the Mackenzie Delta area. Three apprentices and one qualified herder, all natives, left the reindeer service during the year and engaged in trapping. No replacements were available. As the year closed, various staff adjustments and improvements in the facilities for handling the deer and marketing surplus products appeared necessary in order to protect the herds and continue development.

#### EASTERN ARCTIC PATROL

The annual Eastern Arctic Patrol was carried out on the R.M.S. *Nascopie* which sailed from Montreal on July 8, and returned to Montreal on October 16, after making 25 calls. Because of urgent war requirements the passenger list was restricted to administrative officers, Royal Canadian Mounted Police, and radio personnel, and cargo space was limited to essentials. D. L. McKeand, Superintendent of the Eastern Arctic, again was Officer in Charge of the Government party. Dr. H. A. Collins of the Department of Pensions

and National Health served as medical officer for the entire Patrol, and, in addition to examining and treating Eskimo at all ports of call, inspected the hospital and industrial home at Pangnirtung.

A delay of more than two weeks in the St. Lawrence River was occasioned by damage to the ship's boilers, and in order to overcome the loss of time, calls at Chesterfield and Southampton Island were abandoned. Arrangements, however, were made for the servicing of these places by auxiliary services from Churchill, Manitoba.

Owing to the exceptionally large amount of freight destined for ports north of Hudson Strait to be handled at Churchill and the shortage of labour and equipment there, further delays occurred which resulted in the failure of the Patrol to reach Fort Ross at the eastern end of Bellot Strait. The *Nascopie* reached a point within five miles of Fort Ross, but was caught in an ice pack in Prince Regent Inlet. After being beset for five days the ship was extricated and reached open water without damage.

The medical officer reported the health of the Eskimo to be generally good. An epidemic of cerebro-spinal meningitis which occurred in the southern Baffin Island area during January and February, 1943, was investigated but the cause could not be determined in the limited time available at each port. Two Eskimo were transported from River Clyde to Pangnirtung and outfitted at Government expense in order that the family might be re-established before winter and darkness set in.

A coroner's inquest opened at Pond Inlet to investigate the death of an Eskimo woman was adjourned and subsequently reopened at River Clyde. The jury found that death was due to natural causes, and a suspect was released from custody.

Game and other wildlife taken in areas of reputed abundance was sufficient for the native population, although the white fox had reached the bottom of its cycle. Relief costs, nevertheless, were kept at a minimum consistent with native health and welfare. Reindeer skins from the Government reindeer station near Aklavik were distributed for the first time in northern Quebec and Baffin Island. A comprehensive questionnaire on game resources was circulated but the full results will not be available until next year.

Supplies and mail were delivered at various posts, and Royal Canadian Mounted Police and radio station personnel relieved where necessary. The postal service provided by the Patrol, a very important feature, continued to show an increase in the volume of matter handled.

#### YELLOWKNIFE ADMINISTRATIVE DISTRICT

The Local Trustee Board at Yellowknife, consisting of five members, held 14 board meetings during the year, and passed two by-laws covering respectively the assessment of property and the rate of taxation. Many other matters of interest to the community were also discussed.

#### AIDS TO NAVIGATION

Under the direct supervision of the District Agent aids to navigation were maintained for the Department of Transport at points on the Mackenzie River system. Assistance was also extended to Marine Operators, an organization formed to transport freight for the Canol Project from Waterways, Alberta to Norman Wells, N.W.T., in placing additional buoys and lights on the various rivers and lakes. This action resulted in greatly improved navigation conditions during the season.



## PUBLIC IMPROVEMENTS

The two roads on the Fitzgerald-Fort Smith portage, together with the road from Fort Smith to Bell Rock on Slave River, were maintained in first class condition by Marine Operators. This organization also carried out improvements on the first 100 miles of the Fort Smith-Hay River road. The bridge on this road spanning Salt River was reconstructed of heavy materials with a view to permanency.

During the year additional landing fields were completed at Mills Lake, Wrigley, and Camp Canol by the United States Army Engineers, and, together with landing fields at Fort Smith, Fort Resolution, Hay River, Fort Providence, Fort Simpson, and Norman Wells, were maintained in good condition. By the end of the fiscal year, the fields at Fort Resolution and Fort Providence had been turned over to the Department of Transport.

Sites for future landing fields along the proposed "low-level route" from Edmonton, Alberta, to Yukon Territory were located and surveyed by officers of the Department of Transport at Fort Good Hope, Arctic Red River, Bell-Porcupine Rivers, and Bluefish-Porcupine Rivers, N.W.T. A site close to Fort McPherson also was located but not surveyed.

## YUKON TERRITORY

Yukon Territory has an area of 207,076 square miles. It is bounded on the south by British Columbia and Alaska; on the west by Alaska (longitude 141 degrees west); on the north by the Arctic Ocean; on the east by the Northwest Territories. Most of the Yukon's present population is found in three areas: the northern or Dawson District, the southern or Whitehorse District, and the Upper Stewart River or Mayo District. According to the 1941 census, the population of Yukon Territory was 4,914, but this figure has since been greatly increased by the influx of workers on joint defence projects and by military personnel.

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 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. The seat of Government is at Dawson, Y.T.

*Territorial Council*

The triennial election of the Yukon Territorial Council was held on February 9, 1944, and the following candidates were elected for a three-year term: Dawson District, John R. Fraser, Dawson; Mayo District, Ernest J. Corp, Keno Hill; Whitehorse District, Alexander A. Smith, Whitehorse. The Controller of Yukon Territory is G. A. Jeckell, Dawson.

## WORK OF COUNCIL

The Yukon Council was summoned to meet on April 19, and was prorogued on April 22, 1943. The annual supply bill was approved, and ordinances passed respecting the prevention of venereal diseases; the presumption of death in

certain cases; and prohibiting the operation of fee-charging employment agencies in the Territory. Amendments were also made to the Medical, Health, Game, Workmen's Compensation, Motor Vehicle, Government Liquor, Assessment, and Companies Ordinances, and the Income Tax Ordinance of 1940. Some of these amendments were designed to meet conditions created by construction of the Alaska Highway and associated joint defence projects.

## 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; for the administration of the Yukon Placer and Quartz Mining Acts; and for the collection of revenue.

For local purposes, the Territorial Government raised \$88,056.58. The Dominion Government grant to the local government was \$60,000. The amount transferred from the liquor to the general account was \$125,000.

## THE ALASKA HIGHWAY

During the year, the Alaska Highway, linking Dawson Creek, B.C., with Fairbanks, Alaska, a distance of 1,523 miles, was developed from pioneer road stage to the standard of a military highway. Much of this work, which included realignment of the right of way, filling and ballasting, and replacement of temporary bridges with permanent structures, was carried out by civilian contractors under the direction of the United States Public Roads Administration. By November, 1943, the road was reported as completed and turned over to the United States Engineering Division for maintenance. At the peak of construction, more than 40,000 men were employed on the highway and associated joint defence projects. Of the total length of the highway, 1,220 miles are in Canada, and of this distance, about 554 miles are in Yukon Territory.

About 95 miles west of Whitehorse, the Alaska Highway is joined by the Haines Military Road, which provides communication with the port of Haines, Alaska. This spur road, 140 miles in length, has been built to a standard suitable for military use, and was completed in November, 1943. A service truck road which parallels the Canol pipeline from Camp Canol, N.W.T., to Whitehorse, and meets the Alaska Highway at a point about 80 miles east of Whitehorse, was nearing completion at the end of the fiscal year. In addition, a number of approach roads have been constructed to link up the Alaska Highway with airports along the Northwest Staging Route, which follows generally the route of the highway.

United States authorities have constructed flight strips at strategic points along the highway for use in contact flying, and have also erected and placed in operation telephone and telegraph lines along the highway. An overland military mail route providing daily service to points on the highway was also established during the year, and greatly lessens the transit time of mail formerly carried by sea and rail.

In June, 1943, a joint Canada-United States Traffic Control Board was set up to deal with applications and to issue permits for travel over the highway. Travel at present is restricted to those on official business and to bona fide prospectors for minerals of strategic importance.

A permanent officer of the Lands, Parks and Forests Branch of the Department continued to act as Canadian Government liaison officer for the project.

## MINING

Mineral production in Yukon Territory showed a decline as compared with the previous year, but a new interest in the Territory's mineral possibilities was evidenced by the number of prospecting parties that explored the region adjacent to the Alaska Highway during the summer season. Investigations also were extended to the Mayo and Klondike Districts. A geological reconnaissance of a strip along the Alaska Highway from Watson Lake to Teslin River, and a brief examination of the Norman Wells Road to the end of construction were carried out by the Geological Survey of Canada. The discovery of cassiterite in bed-rock in the Dublin Gulch area of the Mayo District was one of the interesting finds of the year.

Placer mining operations, which consisted mainly of dredging, resulted in the production of 52,853.58 ounces of gold, the value of which, at \$35 per ounce, is \$1,849,875. Compared with the previous year, this figure represents a decrease of 52,577.32 ounces, and is attributed to the closing down of one-half of the gold dredges previously operated on account of the prevailing scarcity of labour.

Entries were granted for 92 placer and 27 quartz mining claims and 2,531 such claims were renewed for another year. As no leases of quartz mining claims were granted or cancelled the area held under lease remained 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, 1944, was \$5,326,073.80, of which amount \$19,820.17 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, and comprise a total river stretch of about 14½ miles. The rental received from this source up to March 31, 1944, amounted to \$210,902.77, of which \$144.30 was collected during the fiscal year. These leases comprise portions of the bed of the Klondike River. For the purpose of gold recovery five dredges engaged in mining in Yukon Territory.

*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. Four hydraulic mining locations are still held under lease, comprising a total stretch of approximately 16 linear miles. Rentals amounting to \$215,858.03 have been collected on account of such locations, the amount received during the fiscal year being \$2,326.53.

*Coal Leases.*—Four coal mining leases, comprising in all an area of 210 acres, are in good standing. The revenue for the year from this source amounted to \$181.90.

## PLACER MINING CLAIMS

The total number of placer claims in good standing at the close of the year was 2,624, most of which are held by the Yukon Consolidated Gold Corporation, Limited. Five dredges were operated by this company during the season and these produced 34,304.35 fine ounces of gold and 7,676.69 fine ounces of silver. The company employed an average of 140 men, the peak during the operating season being 197, and expended \$498,617.02 for salaries and wages. A further sum of \$235,070.91 was spent for equipment, supplies, and freight.

The greater part of the 52,853.58 ounces of gold produced during the year was from the Dawson District. The Mayo District produced 530.50 ounces and the Whitehorse District, 181.86 ounces.

## LODE MINING

*Dawson District.*—Entries were granted for 36 quartz claims staked during the year, and 104 mineral claims previously staked were renewed. Late in the year the Yukon Consolidated Gold Corporation, Limited, took an option on the Crown-granted claims held by Consolidated Lone Star, Limited, on Victoria Gulch, Bonanza Creek, and also acquired 19 mineral claims in that vicinity by location. It is understood that extensive prospecting on these properties is planned.

*Mayo District.*—The only lode mining operations in this district during the year were carried on by individual operators, 181 tons of high-grade silver ore being shipped. Two hundred and seventy-four mineral claims were renewed, and 132 others are held under twenty-one-year leases.

*Whitehorse District.*—Eleven new quartz entries were granted and 15 claims previously staked were renewed.

By Order in Council P.C. 4574, dated June 4, 1943, provision was made that the requirements of the Yukon Quartz and Placer Mining Act, Dredging and Hydraulic Mining Regulations as to representation work be suspended, provided the holders of properties acquired thereunder pay to the Mining Recorder the same fees or rental at the same times as they would be required to pay for renewals if the prescribed work had been performed. By this suspension the owners of mining rights were encouraged to retain possession of their holdings until supplies and labour are procurable.

## PROSPECTING LEASES

Prospecting leases representing a total stretch of 148 miles were issued during the year, comprising locations on several water courses, an increase of 40 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 1,073 samples of rock was received from all parts of the Territory, and 1,675 assays or quantitative analyses were made. In addition, qualitative analyses and chemical tests were made in connection with the identification and classification of various rocks and minerals of which no record was kept. The assays made were gold and silver, 1,073; lead, 508; tungsten, 43; zinc, 22; copper, 9; iron, 5; silica, 4; tin, 3; antimony, 3; lime 2; manganese, 1; barium, 1; and molybdenum, 1.

## LANDS AND TIMBER

*Lands.*—During the year two lots were sold and patents issued therefor. The revenue from lands was \$6,606.61. There are now in force 10 agricultural leases, 16 permits to occupy Dominion lands, 23 waterfront leases, and 22 homestead entries.

*Timber.*—The total revenue from timber was \$13,804.23, an increase of \$6,435 over the previous year. Altogether, 153 permits were issued authorizing the cutting of 1,408,657 feet board measure of saw timber, 300 telephone poles, and 20,403 cords of wood, the latter figure being 6,745 cords in excess of the previous year. Fifteen licence timber berths were in force. During the year 14 timber seizures were made.

Timber cut under free permits for joint defence construction projects included 14,500,463 feet board measure of sawn lumber, 49,356 cords of fuel wood, and 618,123 linear feet of timber for bridge piling, building logs, and telephone poles.

During the summer, a forest reconnaissance survey was carried out by a qualified officer of the Department in Yukon Territory along the route of the Alaska Highway and also along the valleys of the Lewes and Yukon Rivers between Whitehorse and Dawson. Much information concerning the timber resources of the regions was obtained, which, it is expected, will be of great value in formulating post-war policies relating to the conservation and utilization of forests. Early in the winter, a departmental officer was detailed as timber inspector to supervise the cutting operations in connection with the Alaska Highway and associated joint defence projects.

#### ROADS AND BRIDGES

Expenditures on the maintenance of the Yukon road system out of territorial funds amounted to \$40,352.60, and was confined almost entirely to repairs and maintenance of roads in the mining areas. Some assistance was also extended to scheelite miners on Dublin Gulch in the Mayo District with the use of bulldozer equipment.

#### DEVELOPMENT OF AIRCRAFT LANDING FACILITIES

A total of \$2,897.42 was expended on improvements to landing fields at Dawson, Mayo, Selkirk, and Carcross. Labour shortages restricted the amount of work that could be carried out. Landing fields at Dawson and Mayo were maintained during the winter months in a condition permitting their use by wheel-equipped aircraft operated on regular schedules by Canadian Pacific Air Lines, Limited.

Additional work was carried out during the year on the airports and aerodromes situated on the Northwest Staging Route, which are operated by the Royal Canadian Air Force.

#### AGRICULTURE

The 1943 season was favourable to agricultural operations, and vegetable crops commonly grown in the Dawson area and at Mayo were good.

During the summer, an exploratory soil survey was made along the route of the Alaska Highway in southern Yukon Territory by a qualified officer of the Department of Agriculture in company with the agrostologist of the University of British Columbia. An extension trip along the Lewes, Yukon, and Stewart Rivers from Whitehorse to Dawson and Mayo was also undertaken by the investigators. Preliminary estimates were made of the areas of land suitable for agricultural purposes, and potential sites for the establishment of an agricultural experiment sub-station in the Territory were examined.

#### FUR AND GAME

Collections made under the Fur Export Tax Ordinance amounted to \$7,488.61, an increase of \$298.09 over the previous year. An increase in the number of bear, fox, lynx, mink, and weasel pelts was reported. Fisher, marten, and muskrat pelts showed little change, but those of beaver, coyote, otter, wolverine, and wolf indicated a considerable decrease from the previous year. The number of wolf pelts presented was 237, and coyote pelts, 159. Revenue from Game Ordinance licences was \$6,044, an increase of \$2,881 over the previous year.

Amendments made to the Yukon Game Ordinance during the year provided for the setting aside of an area of 10.130 square miles in southwestern Yukon as the Kluane Game Sanctuary, and prohibiting the hunting or trapping of wildlife in the Territory within an area extending for a distance of one mile on each side of the Alaska Highway.

During the summer a study of wildlife conditions along the Alaska Highway and adjacent portions of southern Yukon was undertaken by a biologist of the Department, working in conjunction with other departmental officials engaged in a study of forest conditions and post-war recreational opportunities. Special attention was devoted to the area contained in the Kluane Game Sanctuary, which has been reserved from disposal so that it may be available in its present state for establishment as a national park.

#### PUBLIC WELFARE

The health of the people in the Territory generally was good. An epidemic of typhoid occurred among Indians at Dawson, but severe cases were isolated and practically the entire community was immunized against the disease by inoculations carried out by the Medical Health Officer and a staff of volunteer nurses. Active co-operation in the prevention and control of disease was received from United States Army and other agencies. Tuberculin tests of all cattle in the Dawson District were made, and all dairy animals tested were found free of infection.

Registrations under the Vital Statistics Ordinance included 139 births, 78 marriages, and 121 deaths.

Hospitals were operated at Dawson and Whitehorse throughout the year, and grants towards their maintenance were provided by Council. An additional grant was made towards the completion of an addition to the Whitehorse hospital. The numbers of hospital days for patients during the year were: Dawson, 14,969; Whitehorse, 5,684. The number of hospital days for indigent patients at Dawson was 10,333. Nine indigent patients were reported from Whitehorse but the number of hospital days was not reported. A public nurse was employed throughout the year at Mayo by the Territorial Government.

In addition to indigents taken care of exclusively in hospitals, a number of aged or otherwise unemployable persons were extended relief.

#### EDUCATION

Five schools were maintained in the Territory during the year, including two at Dawson and one each at Mayo, Whitehorse, and Carcross. The total number of pupils enrolled at the end of the fiscal year was 283.

#### LAW AND ORDER

Law and order were maintained throughout the Territory by the Royal Canadian Mounted Police, and notwithstanding a very large increase in the civilian population in southern Yukon, no serious crime was reported. Effective co-operation was maintained between the Royal Canadian Mounted Police and United States Army authorities.

#### LAND REGISTRY

The Land Registry maintains a Central Office of Record of lands controlled by the Dominion; administers certain classes of these lands; issues Letters Patent and in conjunction with the Western Provinces adjusts Seed Grain, Fodder, and Relief Indebtedness advanced by the Dominion alone, or by the Dominion and Provinces jointly.

#### CENTRAL OFFICE OF RECORD

This inventory of Dominion-owned lands shows the situation and area of each property and the name of the controlling Department. There are 6,262 parcels listed.

## ORDNANCE AND ADMIRALTY LANDS

During the year, investigations were made of Ordnance and Admiralty Land properties in New Brunswick, Quebec, Ontario, and British Columbia. Four properties were transferred to other departments, 4 parcels were sold, and 41 parcels were leased. Surveys and sub-divisions of properties in Sorel, Quebec, were made. Revenue from Ordnance lands amounted to \$24,208.62.

## PUBLIC LANDS

One parcel of public land was sold and one parcel transferred to the Department for administration. Investigations were made of properties in Nova Scotia, Quebec, Ontario, and Alberta. Revenue derived from Public Lands was \$5,980.04.

## SOLDIER SETTLEMENT LANDS

The unpatented lands against which charges under the Soldier Settlement Act are registered remain vested in the Dominion. In cases where the duties are completed but this indebtedness not repaid, Letters Patent are issued in the name of the Director of Soldier Settlement of Canada under the authority of the provisions of Section 27 of the Soldier Settlement Act, and the amendment of 1931.

## TIMBER AND GRAZING WITHIN THE PROVINCES

*Timber.*—There are 11 licence timber berths covering a total area of 61.41 square miles within the boundaries of National Parks. Two of these berths are in the Province of Manitoba and 9 are in British Columbia. Licences, in duplicate, were issued for each berth and 5 berths were assigned—the revenue amounted to \$5,327.15.

On the Dominion Government Coal Block near Hosmer, B.C., there is one permit timber berth from which a revenue of \$1,381.90 was derived.

The timber cutting privilege granted on Ordnance Reserve No. 1 and Naval Reserve A. on St. Joseph Island in Lake Huron continued active throughout the year producing 2,080 railway ties, 27 cords of pulpwood, 1,624 fence posts and 1,126 feet board measure of hemlock logs. The revenue collected was \$307.48.

*Grazing.*—During the year 10,852 acres were covered by 7 annual grazing permits on quarantine reserves along the southern boundary of Saskatchewan and Alberta and sworn returns by the permittees indicate that for the grazing season of 1943 there were 427 cattle, 235 horses, and 488 sheep maintained on the lands. The revenue consisting of ground rental amounted to \$156.50.

## SEED GRAIN, FODDER, AND RELIEF INDEBTEDNESS

During the year, recommendations relating to the adjustment or apportionment of outstanding seed grain, fodder, and relief indebtedness were submitted in 1,464 cases by the Alberta, Saskatchewan, and Manitoba Adjustment Boards. These recommendations were ratified by Orders in Council and 1,973 discharges and releases of liens were issued. As a result, indebtedness amounting to \$100,433.63 was written off. A total of 2,458 inquiries was received from the provinces for statements of outstanding indebtedness relative to the issue of land grants, and 1,604 certificates of indebtedness were issued. In addition, 5,462 inquiries were received from different Debt Adjustment Boards in the Western Provinces. Gross collections for the fiscal year amounted to \$70,751.68, an increase of \$46,300.88 over the previous year. The sum of \$1,008.47 was refunded, leaving a net revenue of \$69,743.21. The estimated cost of adminis-

tration, including office expenses and field investigations, is approximately \$6,000.

The following summary shows the financial operations for the year ended March 31, 1944.

| Debits—  | Principal             | Interest              | Total                 |
|--|-----------------------|-----------------------|-----------------------|
| Balance outstanding March 31, 1943.....  | \$2,701,129 68        | \$3,558,395 49        | \$6,259,525 17        |
| Accrued interest April 1, 1943, to March 31, 1944 .....  |                       | 157,796 02            | 157,796 02            |
| Total debits.....  | <u>2,701,129 68</u>   | <u>\$3,716,191 51</u> | <u>\$6,417,321 19</u> |
| <i>Credits</i>   |                       |                       |                       |
| Net revenue April 1, 1943, to March 31, 1944.  | \$ 40,318 77          | \$ 29,424 44          | \$ 69,743 21          |
| Amount written off as loss by Orders in Council (Sec. 1, Chap. 51, 17 George V).   | 28,847 05             | 71,586 58             | 100,433 63            |
| Amount collected and retained by Province of Saskatchewan as commission, Clause 18, Natural Resources Agreement with Province of Saskatchewan..... |                       | 2 50                  | 2 50                  |
| Total credits .....  | <u>\$ 69,165 82</u>   | <u>\$ 101,013 52</u>  | <u>\$ 170,179 34</u>  |
| Amount outstanding March 31, 1944.....   | <u>\$2,631,963 86</u> | <u>\$3,615,177 99</u> | <u>\$6,247,141 85</u> |

## SUMMARY

## PROVINCE OF MANITOBA

| Debits—   | Principal           | Interest            | Total               |
|---|---------------------|---------------------|---------------------|
| Amount outstanding March 31, 1943.....                  | \$ 13,054 24        | \$ 18,961 87        | \$ 32,016 11        |
| Accrued interest April 1, 1943, to March 31, 1944 ..... |                     | 676 93              | 676 93              |
| Total debits.....                                       | <u>\$ 13,054 24</u> | <u>\$ 19,638 80</u> | <u>\$ 32,693 04</u> |
| <i>Credits</i>  |                     |                     |                     |
| Net revenue April 1, 1943, to March 31, 1944.           | \$ 821 67           | \$ 482 62           | \$ 1,304 29         |
| Amount written off as loss by Orders in Council .....   | 309 29              | 1,500 51            | 1,809 80            |
| Total Credits .....                                     | <u>\$ 1,130 96</u>  | <u>\$ 1,983 13</u>  | <u>\$ 3,114 09</u>  |
| Amount outstanding March 31, 1944.....                  | <u>\$ 11,923 28</u> | <u>\$ 17,655 67</u> | <u>\$ 29,578 95</u> |

## PROVINCE OF SASKATCHEWAN

| Debits—   | Principal             | Interest              | Total                 |
|---|-----------------------|-----------------------|-----------------------|
| Amount outstanding March 31, 1943.....                  | \$1,735,075 40        | \$2,233,023 78        | \$3,968,099 18        |
| Accrued interest April 1, 1943, to March 31, 1944 ..... |                       | 100,002 58            | 100,002 58            |
| Total debits.....                                       | <u>\$1,735,075 40</u> | <u>\$2,333,026 36</u> | <u>\$4,068,101 76</u> |
| <i>Credits</i>  |                       |                       |                       |
| Net revenue April 1, 1943, to March 31, 1944.           | \$ 32,616 14          | \$ 25,613 50          | \$ 58,229 64          |
| Amount written off as loss by Orders in Council .....   | 8,865 43              | 32,559 26             | 41,424 69             |
| Amount collected retained as commission....             |                       | 2 50                  | 2 50                  |
| Total credits.....                                      | <u>\$ 41,481 57</u>   | <u>\$ 58,175 26</u>   | <u>\$ 99,656 83</u>   |
| Amount outstanding March 31, 1944.....                  | <u>\$1,693,593 83</u> | <u>\$2,274,851 10</u> | <u>\$3,968,444 93</u> |

## PROVINCE OF ALBERTA

| Debits—   | Principal            | Interest              | Total                 |
|---|----------------------|-----------------------|-----------------------|
| Amount outstanding March 31, 1943.....                  | \$ 952,975 04        | \$1,306,374 84        | \$2,259 349 88        |
| Accrued interest April 1, 1943, to March 31, 1944 ..... | .....                | 57,115 26             | 57,115 26             |
| Total debits.....                                       | <u>\$ 952,975 04</u> | <u>\$1,363,490 10</u> | <u>\$2,316,465 14</u> |
| <b>Credits—</b>   |                      |                       |                       |
| Net revenue April 1, 1943, to March 31, 1944.           | \$ 6,880 96          | \$ 3,328 32           | \$ 10,209 28          |
| Amount written off as loss by Orders in Council .....   | 19,672 33            | 37,526 81             | 57,199 14             |
| Total credits.....                                      | <u>\$ 26,553 29</u>  | <u>\$ 40,855 13</u>   | <u>\$ 67,408 42</u>   |
| Amount outstanding March 31, 1944.....                  | <u>\$ 926,421 75</u> | <u>\$1,322,634 97</u> | <u>\$2,249,056 72</u> |
| PROVINCE OF BRITISH COLUMBIA                            |                      |                       |                       |
| Amount outstanding March 31, 1944.....                  | \$ 25 00             | \$ 36 25              | \$ 61 25              |

## LETTERS PATENT

During the year 35 patents covering an area of 3,133 acres were issued for lands in Manitoba, Saskatchewan, Alberta, British Columbia, Northwest Territories, and Yukon Territory. One hundred and sixty-six certified copies of Letters Patent were issued, for which the Department received \$460.

## NATIONAL PARKS BUREAU

Observance of the Government's policy with respect to pleasure travel was continued by the National Parks Bureau during the fiscal year 1943-44, with the result that registrations at park entrances reached a new low of less than one half of pre-war records. This, however, does not mean that the actual use being made of the parks has fallen off to that extent. While complete statistics are not available, it is apparent that many of those who visit the parks under present conditions are staying for longer periods than was the practice before the war, when travel was convenient and unrestricted. The tendency now is for vacationists to spend their whole holiday at one spot instead of moving about from place to place. Indeed, in several of the parks during the summer of 1943 the attendance was so large that difficulty was experienced in finding sufficient accommodation. This situation was of course owing in part to the fact that several of the large hotels and lodges were not in operation because of war conditions.

An interesting development in recent years has been the large percentage of Canadians making use of the parks. Formerly the attendance from other lands, particularly the United States, was most marked, but now Canadian visitors are in the great majority. It well may be that out of this situation will arise a more adequate appreciation by Canadians of the attractions which their country offers in the National Parks, and that this will continue to show its effects after normal travel conditions are restored.

As might be expected under present conditions a considerable number of those who visited the parks were in the uniforms of the Armed Services. Some of the parks are convenient to training centres and offer very popular facilities and environment for rest periods. These advantages are available not only to Canadians, but are shared by visitors from other lands, notably airmen from the United Kingdom, Australia, and New Zealand, and, to some extent, from the United States. Herein is the germ of a greatly widened interest in the Canadian parks which will bear fruit after the war. In the meantime the parks are contributing an important service in providing opportunities for recreation for members of our fighting forces.

The prior claims of the war on all the nation's resources have been fully recognized in the administration of the National Parks. Expenditures have been held to a minimum consistent with prudent conservation of a valuable and irreplaceable national property. General application of this principle, however, has not prevented careful study of plans which should be carried out with the return of peace, and the part the National Parks can play in the post-war reconstruction period. The parks were very appropriately given representation on the Subcommittee on Conservation and Development of Natural Resources of the Advisory Committee on Reconstruction authorized by the Government to "collect, receive, and arrange information with regard to reconstruction policies in Canada and abroad." A brief, in which was stressed the important place of the National Parks in post-war employment and reconstruction, was presented to this Subcommittee and was included in its official report. Likewise a statement on the tourist industry particularly as it is related to and is dependent on the National Parks was presented to the National Tourist Business Meeting held in Quebec City in 1943 under the chairmanship of the Minister of National War Services and was published in full in the Report of Proceedings of that meeting. The National Parks Bureau has not only planned for the post-war future but has given active co-operation to other organizations studying the problems of reconstruction after the war.

## ADMINISTRATION

The National Parks are administered under the authority and provisions of the National Parks Act, sundry provincial agreements, and the National Parks Regulations. The Act defines the general purposes of National Parks as follows:

"The Parks are hereby dedicated to the people of Canada for their benefit, education and enjoyment, subject to the provisions of this Act and Regulations, and such Parks shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations."

Of the townsites in the National Parks, the largest are Banff, with a permanent population of about 2,500, and Jasper, with about 1,500. The Parks Regulations provide for the administration of park areas outside the townsites or subdivisions, as natural museums. In these areas, the natural resources, including the landscape, flora, and fauna, are protected, and so far as possible under the policy defined by the Act, the parks are open to use by the public.

## EVENTS OF INTEREST

The National Parks continued to serve as centres for outdoor life and recreation, and while full use of facilities normally available was not possible owing to war-time conditions, several events organized by public or private enterprise were successfully carried out. The annual four-day camp of the Sky Line Trail Hikers was held from August 6 to 9 on a flat bordering the Spray River about ten miles from Banff in Banff Park. The total number of guests registered was fifty-four, the largest attendance since the organization was formed in 1933. Included were forty-seven Canadians, five visitors from the United States, and one each from Australia and New Zealand.

The number of persons participating in the annual outing of the Trail Riders of the Canadian Rockies from July 30 to August 3 was eighty-four, the second largest in the history of the organization. The route selected for the cross-country ride in Banff Park was via White Man's Pass to Mount Assiniboine and back to Banff by way of the Valley of the Rocks, Simpson Pass summit, and Healy Creek. Six of the riders were British, Australian, and New Zealand

airmen from the Air Base at Calgary, who came as invited guests. At the close of the camp they expressed their enthusiasm for the remarkable scenery of the Canadian Rockies.

The Alpine Club of Canada held an informal camp for members in July at Lake O'Hara meadows in Yoho Park. A number of peaks were climbed by those in attendance, and expeditions were made to places of interest in the vicinity. During the summer, the Alpine Club also undertook a course in mountaineering for members of the armed forces, which was successfully carried out with the assistance of experienced club members in Little Yoho Valley from July 17 to August 7.

Winter sports events were continued in the parks. An enthusiastic group attended the annual ski camp of the Alpine Club of Canada at Stanley Mitchell Hut in Little Yoho Valley, Yoho Park, from April 17 to 25. The 37th annual bonspiel of the Banff Curling Club had the largest list of entries in its history, with representatives from many parts of Alberta. Altogether, 32 rinks took part, and the grand aggregate and the visitors' competition were won by the Howard Palmer rink of Calgary. The annual winter carnival held at Jasper also was well attended. The attractions consisted of figure skating, races, hockey games, and the crowning of the Carnival Queen.

The popularity of the Banff School of Fine Arts, which held its 11th annual course in Banff from July 28 to August 28, was evidenced by an increased attendance. Sponsored by the Department of Extension, University of Alberta, this project offers courses in the theatre, art, music, handicrafts, and oral French. Registrations were received from many of the provinces and the United States.

Golf courses in the National Parks received good patronage, and a number of local tournaments were conducted during the season. A very successful event held at Wasquesiu in Prince Albert Park in aid of the Red Cross attracted 194 entries and netted \$560. The annual golf tournament at Wasagaming, Riding Mountain Park, was staged for the third successive year as a war charity event, and the net proceeds realized, \$251.48, were turned over to the Wasagaming Women's Red Cross group. The annual tournament at Waterton Lakes Park was held under the auspices of the Cardston Golf Club.

Bath-houses and swimming pools operated at the hot mineral springs in the parks had an increased patronage. The bathing facilities at the Upper Hot Springs in Banff Park were used by 69,095 persons, an increase of 20,647 over the previous year, and at the Cave and Basin Springs, 49,561 persons were registered, an increase of 6,137 over the 1942-43 figure. At Radium Hot Springs in Kootenay Park, the number of persons making use of the outdoor pool was 25,293, an increase of 3,316.

Although motor travel has been curtailed by war-time restrictions, considerable use was made of public camp-grounds in the parks. A total of 7,657 persons enjoyed camping and picnic facilities at Tunnel Mountain camp-ground in Banff Park, in addition to 15,110 persons using the picnic grounds in Central Park at Banff. Public camp-grounds in Yoho, Kootenay, Waterton Lakes, Elk Island, Prince Albert, Riding Mountain, and Point Pelee Parks were also used by park visitors.

The park museum at Banff continued to be a source of interest to visitors, and during the year 21,022 visitors were registered. Permanent exhibits in the museums in Prince Albert and Riding Mountain Parks also were on view during the tourist season.

#### TRAVEL TO THE PARKS

Visitors to the National Parks and National Historic Parks numbered 415,351. Although this figure represents a decrease in total attendance of 11 per cent as compared with the previous year, nevertheless increases were

registered at a number of parks. Details respecting the attendance at individual parks, together with comparative figures for 1942-43, are given in the accompanying table.

|                             | NATIONAL PARKS |         |
|-----------------------------|----------------|---------|
|                             | 1943-44        | 1942-43 |
| Banff .....                 | 112,085        | 126,590 |
| Cape Breton Highlands.....  | 17,612         | 10,189  |
| Elk Island .....            | 13,400         | 12,916  |
| Georgian Bay Islands .....  | 3,043          | 4,528   |
| Glacier .....               | 374            | 211     |
| Jasper .....                | 11,905         | 11,757  |
| Kootenay .....              | 14,721         | 11,602  |
| Mount Revelstoke .....      | 3,222          | 2,977   |
| Nemiskam .....              | 24             | 13      |
| Point Pelee .....           | 36,477         | 55,580  |
| Prince Albert .....         | 10,131         | 12,789  |
| Prince Edward Island.....   | 24,963         | 24,826  |
| Riding Mountain .....       | 75,128         | 95,628  |
| St. Lawrence Islands.....   | 8,344          | 9,305   |
| Waterton Lakes .....        | 38,780         | 40,433  |
| Yoho .....                  | 5,612          | 6,859   |
|                             |                |         |
| NATIONAL HISTORIC PARKS     |                |         |
| Fort Anne .....             | 7,640          | 2,938   |
| Fort Beausejour .....       | 2,854          | 3,020   |
| Fort Chambly .....          | 9,779          | 10,244  |
| Fortress of Louisbourg..... | 2,383          | 2,666   |
| Fort Malden .....           | 12,308         | 14,709  |
| Fort Wellington .....       | 2,403          | 4,826   |
| Port Royal .....            | 2,163          | 1,639   |
|                             |                |         |
|                             | 415,351        | 466,245 |

#### DIRECT REVENUE

The gross revenue from the National Parks and from the administration of the Migratory Birds Convention Act for the fiscal year 1943-44 amounted to \$335,614.41 and \$299 respectively, or a total of \$335,913.41. Compared with figures of \$273,887.94 and \$443.80 respectively for 1942-43, or a total of \$274,331.74, the increase in ordinary revenue was \$61,581.67.

#### MAINTENANCE AND IMPROVEMENTS

Motor highways and secondary roads, trails, bridges, buildings, and recreational facilities in National Parks were maintained as economically as possible. Provision of municipal services in park townsites was also continued on a repayment basis.

#### ROADS AND BRIDGES

New highway construction was restricted to 4.8 miles from Minnewanka to Anthracite in Banff Park, and 2 miles from the Jasper-Edmonton Highway to the fish hatchery in Jasper Park. In Glacier Park 7½ miles of horse trail was improved to fire trail standard and in Yoho Park a new bridge across the Kicking Horse River was partly completed. Maintenance was carried out on existing roads in all parks throughout the season, and included gravelling, repairs, and replacements to culverts and bridges, and general improvements.

#### TRAILS

A limited amount of new trail construction was carried out for fire protection purposes. During the year a total of 37 miles of new trail was constructed as follows: Banff Park, 12.5 miles of standard and 5 miles of fire

trail; Jasper Park, 5 miles of standard trail; Mount Revelstoke Park, 1.5 miles of standard trail; Yoho Park, 8.5 miles of standard and 1.5 miles of fire trail, and in Prince Albert Park, 3 miles of fire trail. In addition 63 miles of existing trails were improved.

#### COMMUNICATION SYSTEMS

New telephone line construction carried out during the year totalled 13 miles. Included in this were 3 miles in Banff Park, 7 miles in Yoho Park, and 3 miles in Riding Mountain Park. Reconstruction and improvement of existing lines totalled 92.5 miles as follows: Banff, 25 miles; Kootenay, 2.5 miles; and Riding Mountain, 65 miles.

Portable and stationary trans-receiver radio sets continued to operate successfully throughout the season. This type of communication has proved very satisfactory in Banff, Jasper, Prince Albert, Riding Mountain, and Cape Breton Highlands Parks, especially during periods of high fire-hazard. No additional equipment was purchased during the year.

The following table shows the mileage of roads, trails, and telephone lines within the National Parks as of March 31, 1944:

| National Park              | Roads |           |       |         | Trails  | Telephone Lines |
|----------------------------|-------|-----------|-------|---------|---------|-----------------|
|                            | Motor | Secondary | Fire  | Total   |         |                 |
| Banff.....                 | 180.0 | 10.5      | 89.5  | 280.0   | 739.8   | 270.0           |
| Cape Breton Highlands..... | 50.8  | 1.6       |       | 52.4    | 21.0    |                 |
| Elk Island.....            | 16.0  |           |       | 16.0    | 14.0    | 16.0            |
| Glacier.....               |       |           | 20.5  | 20.5    | 91.0    | 1.5             |
| Jasper.....                | 144.0 | 18.5      | 34.7  | 197.2   | 590.1   | 414.2           |
| Kootenay.....              | 61.1  |           | 9.5   | 70.6    | 155.2   | 60.0            |
| Mount Revelstoke.....      | 18.0  |           |       | 18.0    | 33.5    | 10.7            |
| Point Pelee.....           | 6.5   | 2.8       |       | 9.3     |         |                 |
| Prince Albert.....         | 69.0  | 43.0      | 163.0 | 275.0   | 236.5   | 134.0           |
| Prince Edward Island.....  | 7.1   | 2.5       |       | 9.6     |         |                 |
| Riding Mountain.....       | 51.6  | 52.9      |       | 104.5   | 113.0   | 149.0           |
| Waterton Lakes.....        | 47.8  | 13.5      | 12.0  | 73.3    | 159.4   | 60.2            |
| Yoho.....                  | 46.0  | 6.5       | 25.0  | 77.5    | 188.5   | 62.5            |
| Total.....                 | 697.9 | 151.8     | 354.2 | 1,203.9 | 2,342.0 | 1,178.1         |

#### BUILDINGS AND NEW CONSTRUCTION

Buildings and other structures completed during the year included: a new lookout tower and cabin on Mount Sarbach, a new fence at Central Park, 18 pre-fabricated buildings for alternative service work camps, and a new wharf under construction at Lake Minnewanka, all in Banff Park; in Jasper Park, 10 rearing ponds near the hatchery as well as a 60-foot by 3-foot retaining wall on the Rocky River; new lookout cabins on Sofa Mountain in Waterton Lakes Park and on Mount King in Yoho Park; a garage at Kootenay Crossing warden station, and a new dam at the water intake in Kootenay Park; in Cape Breton Highlands Park a new tool shed at the golf course; and in Glacier Park a stable and stores building at warden headquarters.

New construction under private enterprise in Banff Park included a new garage at Sunshine Lodge, and a small building at Sulphur Mountain Chalet; in Jasper Park, two new buildings in the townsite; in Waterton Lakes Park a new garage in the townsite and a new hospital hut at the Y.M.C.A. camp; a cottage and two garages in Wasagaming townsite, Riding Mountain Park.

#### GENERAL IMPROVEMENTS

In Banff Park a new water tank was installed at Tunnel Mountain Lookout, a warning signal placed at the water intake, a boulevard built, and the

sidewalk raised on Banff Avenue. In Yoho Park some houses in the townsite were redecorated, and in Jasper Park a small building was moved from Patricia Lake to the townsite, the hatchery walls and ceilings were insulated, and on October 20, 1943, the electric lighting system was taken over by the Dominion Electric Power Company of Estevan, Saskatchewan. In Riding Mountain Park the dams near the Bubbling Spring were rebuilt, and in Prince Albert Park dams situated at Anglin Lake and on the Kingsmere River respectively, were repaired. In Elk Island Park, 1,000 poplar cuttings were placed in the nursery, 1,200 were set in sand for later planting, and 125 one-year trees were planted in permanent locations. In Cape Breton Highlands Park, poplars were planted on the golf course, and in Prince Edward Island Park, 13 acres in the Dalvay House area were planted with Norway spruce, red pine, and American elm.

#### LAKE MINNEWANKA POWER DEVELOPMENT

Under authority of the War Measures Act, permission was granted in 1941 to the Calgary Power Company to develop hydro-electric power at Anthracite in Banff National Park, from water stored in Lake Minnewanka.

Work was commenced on the project in 1941 and the actual hydro-electric development work was practically completed in 1942 when the Calgary Power Company took over the Banff electric distribution system on November 18. Full-time winter operation of the new power plant started on December 1.

During the fiscal year 1943-44, the Power Company has been engaged in the replacement or restoration of parks facilities and developments which had been rendered useless or damaged by the operations and scope of the power development scheme. The Company also carried out some minor improvements and additions in connection with their power plant.

A trail was built from the camp-ground to the site of the Stewart Canyon Bridge and the construction of this bridge was then undertaken and completed. A parking area was cleared and graded and a loop road constructed at the camp-ground. Filling was placed in the development area. The Minnewanka-Anthracite scenic road, Route "B", was constructed and gravelled and the landing dock was extended and filled. At the north end of Lake Minnewanka clearing up to the 4,840-foot contour was carried out, and at the south end clearing is still in progress.

At the power plant the surge tank and wood stave pipeline were repainted and landscaping was carried out. The tail-race fencing was extended for some distance and a hand railing was placed on top of the control dam at the intake. The camp used by the Company during construction operations was cleaned up and the temporary buildings razed. At the Ghost River diversion channel improvements were underway including a channel at the west end of Johnston Lake to take care of leakage and run-off.

The extent of the restoration and replacement work to be carried out by the Calgary Power Company in park areas adjacent to, or affected by, the Lake Minnewanka power development scheme, is provided for in the interim licence issued to the company. Although a certain amount of this work has been completed, there still remain for consideration items of work including the restoration of areas worked over during construction to a natural landscape appearance: the installation of a water system for the tourist area at the west end of Lake Minnewanka: completion of the landing wharf and the construction of hub-rails on new roads constructed in the area; additional clearing to the 4,840-foot contour on the south, north, and east shores of Lake Minnewanka. Labour shortage has considerably affected the progress of the improvement work during the year but this is to be completed as soon as conditions permit.

## USE OF ALTERNATIVE SERVICE WORKERS

In 1941 the National War Services Regulations were amended so as to permit Mennonites and other conscientious objectors exempted from military training to perform alternative service for the duration of the war. On December 1, 1942, the administration of these Regulations, which up to this time had been carried out by the Department of National War Services, was transferred to the Department of Labour.

Under this authority, the camps which were established in 1941 in Banff, Kootenay, and Riding Mountain National Parks continued to operate throughout the year, and those at Jasper and Prince Albert National Parks were closed early in the autumn of 1943.

During the 12 months period ended March 31, 1944, a total of 565 men in the 19-to-40-year-old class of July 1, 1940, reported for work. Of these 21 were discharged as medically unfit, 18 joined the armed forces, 15 deserted, and 228 were transferred to agriculture and industry.

Work performed during the year included construction of 10.5 miles of fire trails, and 2.25 miles of telephone line; improvement of 6 miles of secondary roads, 108 miles of fire trails, and 176 miles of telephone lines; and preparation of 1,930 logs for guard-rails and 471 fence posts. Tourist and campground facilities were improved, and a number of sectional buildings and one permanent building were constructed.

Control of forest insect infestation in Kootenay Park was continued, and resulted in the salvage of 800,000 board feet of sawn lumber, and 425,379 linear feet of mine-props. In addition salvage of fire-killed timber in Banff and Riding Mountain Parks produced 1,185,443 linear feet of mine-props and 3,851 cords of fuel-wood.

As in former years, alternative service workers were trained for forest protection, and during the fire season formed the nucleus of crews used for the detection and suppression of forest fires.

During the year the number of men employed in these camps was reduced considerably by the transfer of many workers to agriculture and industry. This resulted in a falling off in the amount of work produced, and in some cases an increase in the man-day costs. However, in spite of these interruptions the return of work compared very favourably with that performed by regular park labour paid at prevailing rates.

## NATIONAL HISTORIC PARKS AND SITES

The restoration, preservation, and administration of National Historic Parks and Sites, and the commemoration of the public services of outstanding Canadians is entrusted to the National Parks Bureau. The Historic Sites and Monuments Board of Canada, an honorary body of recognized historians representing the various provinces of the Dominion, acts in an advisory capacity to the Bureau in this phase of its work.

Judge F. W. Howay of New Westminster, British Columbia, a member of the Board for more than twenty years, and chairman since November, 1941, died on October 4, 1943. He was succeeded as chairman by Dr. J. Clarence Webster of Shediac, New Brunswick. Two new board members appointed during the year were Professor M. H. Long, Department of History, University of Alberta, and Professor Walter N. Sage, Head of the Department of History, University of British Columbia.

The personnel of the Board is as follows: Chairman, Dr. J. Clarence Webster, Shediac, N.B.; Professor Fred Landon, London, Ont.; Professor D. C. Harvey, Halifax, N.S.; the Hon. E. Fabre-Surveyer, Montreal, P.Q.; J. A.

Gregory, M.P., North Battleford, Sask.; the Rev. Antoine d'Eschambault, St. Boniface, Man.; Major G. Lanctot, Dominion Archivist, Ottawa, Ont.; Professor M. H. Long, Edmonton, Alta.; Professor Walter N. Sage, Vancouver, B.C.; W. D. Cromarty, National Parks Bureau, Ottawa, Ont.

A general meeting of the Board, the first since the outbreak of the war, was held in Ottawa on May 19-21, 1943. A wide variety of matters relating to the historic background of the Dominion was reviewed and a selection made of sites to be marked at a later date. Of the total number of sites already considered by the Board, 332 have been marked or acquired and 162 recommended for future action.

## NATIONAL HISTORIC PARKS

Buildings, memorials, features of interest, and grounds within the National Historic Parks were maintained during the year. All interior and exterior woodwork of the "Habitation" at Port Royal Park, N.S., was given a protective coat of preserving fluid which greatly improved its appearance. Approximately 40 pieces of furniture, made at the Acadia Forest Experiment Station, Fredericton, N.B., in accordance with designs prepared by Dr. C. W. Jefferys, R.C.A., have been placed in position in the various rooms of the Habitation. At Fort Anne Park, Annapolis Royal, N.S., the roadways were repaired, iron bars installed on the basement windows, and cannon, benches, signs, and fence posts painted.

A new sign depicting the Fortress of Louisbourg, N.S., as it existed in 1745, was carved at the Acadia Forest Experiment Station with a view to having it placed in a suitable position on the park grounds. Repairs were carried out to the entrance road which was damaged in a severe storm, and extensive painting carried out on park buildings and properties.

Drainage from the basement of the museum at Fort Beausejour Park, Aulac, N.B., was improved by replacing existing pipe with a larger size. The walls of the fort at Fort Chambly Park, Que., were repointed where necessary. Painting, pruning, and general improvement work was also carried out.

Exhibit cases and tables obtained for the museum at Fort Wellington Park, Prescott, Ont., were painted and new electric fixtures installed. Repairs were made to the roof of the guard-house and to the palisades surrounding the fort. The public parking area was levelled, brush was removed from the moat, and the interior of some buildings whitewashed.

Improvements to Fort Malden Park, Amherstburg, Ont., included the laying of a tile drain to the moat; repairs to the fence at the southern boundary of the park; and painting of the fence along the front of the property. A number of articles of historic interest were added to the museum collection.

## NATIONAL HISTORIC SITES

Three standard tablets erected in the Public Archives of Canada, Ottawa, to commemorate the British Explorers who participated in the conquest of the Canadian Arctic during the years 1497-1880, together with one commemorating the distinguished public services of Douglas Brymner, First Dominion Archivist, were unveiled on May 20, 1943, under the auspices of the Women's Canadian Historical Society of Ottawa. The ceremony was attended by the members of the Historic Sites and Monuments Board, who were holding their annual meeting at the time.

During the year all the sites which have been marked on the advice of the Board were suitably maintained. These include Indian earthworks, forts, and villages; French forts, trading posts, and mission enterprises; sites connected with British exploration and naval and military operations in the long struggle for the possession of Canada; posts of the Hudson's Bay Company, and sites related to the social, economic, and industrial development of the country.



## CONSERVATION SERVICES

## FOREST PROTECTION

A marked increase in precipitation since 1940, has resulted in a general reduction of the fire-hazard. A steady decrease is noted in the number of fires reported, from 120 in 1939, 104 in 1940, 64 in 1941, and 37 in 1942, to only 23 in 1943. The area burned has also decreased proportionately from 186,362 acres in 1940, to 5,492.75 acres in 1943. Ninety-two per cent of the area burned was in Prince Albert Park.

An analysis of the causes of these fires shows that carelessness of settlers was responsible for 26 per cent of the total; campers and smokers, 34 per cent; lightning, 13 per cent; incendiary and miscellaneous, 18 per cent, and the remainder unknown.

Classified according to size, 44 per cent burned less than one-quarter acre, 17 per cent from one-half to 10 acres, 30 per cent from 10 to 500 acres, and 9 per cent more than 500 acres.

## FIRE LOSSES IN NATIONAL PARKS

| Park                      | Number of Fires |      | Area Burned Acres |        | Cost of Suppression |             |
|---------------------------|-----------------|------|-------------------|--------|---------------------|-------------|
|                           | 1942            | 1943 | 1942              | 1943   | 1942                | 1943        |
| Banff.....                | 3               | 0    | 1                 | 0      | \$ 3 46             | \$ 0 00     |
| Cape Breton Highlands.... | 0               | 1    | 0                 | 10     | 0 00                | 1 00        |
| Elk Island.....           | 2               | 0    | 710               | 0      | 14 75               | 0 00        |
| Glacier.....              | 2               | 1    | 35                | 15     | 383 61              | 7 20        |
| Georgian Bay.....         | 1               | 0    | spot              | 0      | 0 00                | 0 00        |
| Jasper.....               | 0               | 5    | 0                 | 1      | 0 00                | 10 92       |
| Kootenay.....             | 0               | 1    | 0                 | spot   | 0 00                | 6 75        |
| Mount Revelstoke.....     | 5               | 0    | 243½              | 0      | 3,204 67            | 0 00        |
| Nemiskam.....             | 0               | 0    | 0                 | 0      | 0 00                | 0 00        |
| Point Pelee.....          | 2               | 1    | 1,200             | 400    | 0 00                | 0 00        |
| Prince Albert.....        | 19              | 9    | 81,773            | 5,053½ | 9,894 99            | 1,168 69    |
| Prince Edward Island..... | 1               | 0    | 1                 | 0      | 0 90                | 0 00        |
| Riding Mountain.....      | 1               | 3    | 5                 | 14     | 20 20               | 264 65      |
| St. Lawrence Islands..... | 1               | 0    | spot              | 0      | 0 00                | 0 00        |
| Waterton Lakes.....       | 0               | 2    | 0                 | spot   | 0 00                | 50 00       |
| Yoho.....                 | 0               | 0    | 0                 | 0      | 0 00                | 0 00        |
|                           | 37              | 23   | 83,968            | 5,492¾ | \$13,422.58         | \$ 1,509 21 |

## IMPROVEMENT IN FIRE PREVENTION EQUIPMENT

During the year three new fire lookouts were completed as follows: Sarbach tower on Mount Sarbach in Banff Park, Mount King cabin in Yoho Park, and Sofa Mountain cabin in Waterton Lakes Park. In addition a trail was built and a telephone right of way cleared from the highway to the site of Sunset lookout on Mount Coleman in Banff Park, and a trail completed to within one mile of the Palisades lookout site in Jasper Park. Material for both of these lookouts is on hand. This makes a total of nine completed lookouts which will be in operation in the Mountain Parks for the start of the fire season in the spring of 1944.

Purchase of new fire-fighting equipment was limited to replacements and repair parts necessary to maintain the efficiency of the various fire-fighting organizations.

## FIRE WEATHER FORECASTING

Fire weather recording stations established in 1940 and 1941 were in operation in Banff, Jasper, Yoho, Waterton Lakes, Prince Albert, and Riding Mountain National Parks from April until October. For the most part the fire-

hazard index fluctuated between low and moderate, with short periods of high and extreme in the spring and autumn.

## INSECT CONTROL

Operations for the control of the mountain pine bark-beetle (*Dendroctonus Monticolae*) which were started in Banff and Kootenay Parks in 1941 were continued. Areas which had not been previously treated were surveyed and all infested trees were marked, cut, and burnt. During this period 3,606 acres were cruised, 2,456 acres were treated, and 2,553 trees were burnt.

In Kootenay Park operations consisted of the salvage of beetle-killed pine from areas on each side of the Banff-Windermere Highway, and the cutting and burning of infested green trees. Using alternative service workers, logging and milling operations were carried out which produced approximately 800,000 board feet of lumber and 425,379 linear feet of mine-props.

Co-operation with the Division of Entomology, Department of Agriculture, was continued throughout the year.

## SALVAGE OF FIRE-KILLED TIMBER

As a result of the critical fuel situation, western coal mines were urgently in need of mine-props. In order to help supply the needs of these mines, a fuel-wood and mine-prop camp was established in the Cuthead Creek area of Banff Park to salvage fire-killed lodgepole pine. Alternative service workers were used and during the eight months period that the camp was in operation, approximately 1,185,443 linear feet of mine-props and 1,558 cords of fuel-wood were produced.

Under authority of Order in Council P.C. 6180 dated August 8, 1943, a prisoner-of-war camp was established in Riding Mountain Park under the jurisdiction of the Department of Labour for the production of fuel-wood to meet the fuel-wood shortage in Manitoba. By the end of March this camp produced a total of 26,000 cords of fuel wood.

## DISPOSAL OF TIMBER UNDER ANNUAL CUTTING BUDGET

Cutting of saw-timber and fuel-wood under the annual budget plan was continued in Riding Mountain Park. In comparison with the fiscal year 1942-43, this year's cut showed a marked increase in the amount of poplar cut for saw-timber, but the cut of coniferous species was well within the limit allowed by the working plan. During the year permits were issued for 3,707,298 feet board measure of saw-timber, 44,441 cords of fuel-wood, 96,916 posts, and 14,140 poles.

## WILDLIFE MANAGEMENT

The year 1943-44 was marked by further developments in the matter of over-population of game animals. Special investigations made during the summer showed that all of the best game areas in Canada's mountain parks are involved. Depletion of natural forage continues and if epidemics are to be avoided and range deterioration checked, a yearly removal of surplus animals must be organized. Plans in this connection for 1943-44 received a setback because of the lack of storage space for meat in packing houses in the west. Considerable progress was made, however, and many elk were disposed of in Banff, Jasper, and Kootenay Parks. Fortunately the winter was very open and game herds of all species came through in good condition. It will be a few years before any large improvement in range can be registered.

A special feature of this year's removal of surplus elk in the mountain parks was the preparation of a number of skins suitable for shipment to destitute natives in the Eastern Arctic to be tanned by Eskimo methods and made into clothing. These shipments will go forward in 1944.

In addition to the previously mentioned investigation of game animals and game ranges in Banff, Jasper, and Kootenay National Parks, a scientist of the Department's staff spent some weeks in Kootenay and Mount Revelstoke National Parks, compiling faunal lists previously not available for these parks.

#### WILD ANIMAL PARKS

During the autumn, 600 buffalo were slaughtered under contract in Elk Island National Park. The animals were in splendid condition and record prices were obtained for the meat. The hides were turned over to the Royal Canadian Mounted Police. Buffalo to the number of twenty were slaughtered in Riding Mountain National Park and the meat and hides disposed of to good advantage. In addition to buffalo, 450 moose and elk were slaughtered at Elk Island National Park and the meat and hides turned over to the Indian Affairs Branch.

In addition to the herd of buffalo in Elk Island National Park, a herd estimated at 12,000 ranges in Wood Buffalo Park, an unfenced area in northern Alberta and Mackenzie District. Recent reports indicate that buffalo are increasing west of Wood Buffalo Park.

Following is a census of wild animals in fenced enclosures in National Parks as of March 31, 1944:

#### ANIMALS IN FENCED AREAS

| Species                  | Banff Park Paddock | Elk Island Park | Nemiskam Park | Prince Albert Park Paddock | Riding Mountain Park Paddock | Total        |
|--------------------------|--------------------|-----------------|---------------|----------------------------|------------------------------|--------------|
| Antelope.....            |                    |                 | 110           |                            |                              | 110          |
| Buffalo.....             | 15                 | 873             |               | 8                          | 60                           | 956          |
| Elk.....                 | 1                  | 635             |               |                            | 175                          | 811          |
| Moose.....               |                    | 160             |               |                            |                              | 160          |
| Mule deer.....           |                    | 24              |               |                            | 1                            | 25           |
| White-tailed deer.....   |                    |                 |               |                            | 12                           | 12           |
| Rocky Mountain goat..... | 1                  |                 |               |                            |                              | 1            |
| <b>Total.....</b>        | <b>17</b>          | <b>1,692</b>    | <b>110</b>    | <b>8</b>                   | <b>248</b>                   | <b>2,076</b> |

#### WILDLIFE CONSERVATION

Conservation activities necessary to prevent the depletion of Canada's wildlife resources were continued by the Bureau. The Advisory Board on Wildlife Protection, an interdepartmental committee organized December 28, 1916, met during the year to discuss special wildlife problems relating to the Northwest Territories, especially the conservation of beaver and marten.

The Bureau was represented at the following conservation and scientific conferences relating to wildlife:

The 61st Stated Meeting of the American Ornithologists' Union, New York, N.Y., October 20-21, 1943.

Meeting of the International Committee for Bird Preservation, New York, N.Y., October 22-23.

Regular Meetings of the Subcommittee on Conservation and Development of Natural Resources.

#### FISHING AND FISH CULTURE

Fish cultural activities were continued in the National Parks in spite of war-time restrictions on travel and on gasoline and other supplies, and every effort is being made to provide good fishing for the future in these recreational areas.

Fishing in Banff Park in general was very good and in Lake Minnewanka it was exceptionally good. A further survey of the fish in Lake Minnewanka was made to study the effect on them of the raising of the lake level by recent power development there. The Banff Hatchery again supplied fry and fingerlings for stocking waters in Yoho and Kootenay Parks.

Trout fishing in the Clyburn River, Cape Breton Highlands National Park, was very good during the past season and trout were also caught in other streams in the park. Fewer salmon were caught in the Cheticamp River this season, but deep-sea fishing was very successful.

In Glacier National Park the fishing was generally poor, although in the month of September several good catches of Dolly Varden trout were reported.

Certain improvements were made in the Jasper Park Hatchery and a layout of ten rearing ponds was constructed on the flat to the northwest of the Hatchery building. These ponds are about twenty-four feet in diameter and two feet deep.

Fishing in Jasper Park was reasonably good during the season and some lakes which had produced no fishing for several years gave good catches.

In Kootenay National Park there was considerably less fishing than usual during the past season. This may be owing to some extent to the fact that the fishing in the larger streams was poor until the water in these streams cleared up in early September.

The fishing in Mount Revelstoke Park was much better this year than for some years, particularly in Millar Lake. The Kamloops trout fingerlings planted in Lake of Jade three years ago are doing very well and are in excellent condition.

Fishing in Waskesiu Lake, Prince Albert National Park, was very fair throughout the season. Some good catches of lake trout were reported taken from Kingsmere and Crean Lakes. Commercial fishing for whitefish was permitted in certain lakes in Prince Albert Park during the summer and winter.

During the summer months commercial fishing was carried on at Clear Lake, Riding Mountain Park. In the month of September, 274 adult lake trout were transferred to Clear Lake from Clearwater Lake, north of The Pas. Fishing in park lakes showed some improvement, especially in the autumn, when some good catches were made in Lakes Clear, Moon, Katherine, and Audy.

Fishing conditions in Waterton Lakes National Park during the past season were not as good as in 1942. There were about the same number of anglers indulging in the sport but smaller catches were reported. The fishing in Yoho National Park waters during the year was fair.

Nine hundred and forty creel census cards, showing 3,137 fishing efforts, were returned. This is less than the number of cards returned last year. Every angler fishing in the western parks should fill out and return a creel census card in order that the fluctuations of fishing from year to year may be recorded.

The following statement shows the number of fry, fingerlings, and adult fish distributed in park waters during the year:

| Park                 | Rainbow Trout  | Cutthroat Trout | Speckled Trout | Lake Trout    | Total          |
|----------------------|----------------|-----------------|----------------|---------------|----------------|
| Banff.....           | 334,400        |                 | 32,950         |               | 367,350        |
| Jasper.....          | 160,500        |                 | 27,800         | 9,832         | 198,132        |
| Kootenay.....        | 40,000         |                 |                |               | 40,000         |
| Waterton Lakes.....  | 59,928         | 9,116           |                |               | 69,044         |
| Yoho.....            | 20,000         |                 |                |               | 20,000         |
| Riding Mountain..... |                |                 |                | (Adults) 274  | 274            |
| <b>Total.....</b>    | <b>614,828</b> | <b>9,116</b>    | <b>60,750</b>  | <b>10,106</b> | <b>694,800</b> |

## MIGRATORY BIRDS CONVENTION ACT

The Migratory Birds Treaty, which 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), 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 both the Dominion and the provinces.

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 to the Royal Canadian Mounted Police in 1932.

In the spring and early summer of 1943 conditions for waterfowl in British Columbia were very satisfactory owing to unusually low temperature and heavier precipitation. In the Prairie Provinces, especially in Manitoba, water levels were higher than in 1942 and were well maintained through the season in many regions. This resulted in increased waterfowl populations that were more abundant than for many years. Many areas in Ontario and Quebec suffered from excessively high water levels that were long maintained in the spring and early summer of 1943. As a result, waterfowl nesting was interfered with and the growth of food-plants for these birds was greatly reduced in many areas. In the hunting season there was a large concentration of black ducks along the St. Lawrence River below Montreal, but in various other areas where these birds generally provide good hunting they were much less abundant than usual. The flight across southern Ontario of diving ducks from the prairies also showed marked reduction. The population of wild geese and woodcock was well maintained, but the numbers of Wilson's snipe were still unsatisfactory. In the Maritime Provinces there was an excellent nesting season and large numbers of young birds were raised. Brant appeared to be on the increase, but have shifted their feeding-grounds. There appeared to be a decline in the numbers of black ducks.

Only minor changes were made in the Migratory Bird Regulations for the hunting of waterfowl and other migratory game birds. Successful co-operation was continued with provincial governments, game conservation societies, and other organizations interested in bird conservation.

Because of the food shortage in Saguenay County, Quebec, which resulted largely from enemy action in 1942, Order in Council P.C. 3754, of May 6, 1943, was passed, permitting residents there who were suffering from the food shortage to take certain protected birds and eggs until the end of June.

In the entire Dominion there are 710 honorary game officers, of whom 9 are officers of the Forest Service, 90 are officers of the Department of Fisheries, and 105 are Canadian Pacific Railway Police. The game and fishery officers of the Provinces of New Brunswick, Quebec, Ontario, Manitoba, and British Columbia and the members of the New Brunswick Provincial Police are ex officio game officers under the Migratory Birds Convention Act.

Field administration of the Act was continued under the supervision of four District Migratory Bird Officers. This work included preparation and publication of waterfowl life histories, general waterfowl investigations, the study of the relation to waterfowl of the water restoration projects undertaken by authority of the Prairie Farm Rehabilitation Act, and, in conjunction with the National Parks Bureau, wildlife surveys of several of the parks. Officers of the Bureau continued to disseminate, by lectures and the radio, information about migratory birds and their conservation, and lecture material, including motion pictures and lantern slides, was lent to voluntary assistants.

Sixty-two bird sanctuaries, comprising an area of approximately 1,300 square miles, are now reserved under the Migratory Birds Convention Act in

Canada. One new sanctuary, Ken-Wo Country Club in the Province of Nova Scotia, was established during the year.

It is indispensable that certain precise data concerning wild birds be available for guidance in adequate conservation of wild bird life as a valuable natural resource. The only satisfactory way in which much of the important information required may be obtained is by means of scientific bird banding. Official bands bear an identifying number and a return address. Thereby birds that are marked with them become identifiable as individuals about which many facts can be accurately recorded during their life span in their natural habitat.

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, Washington, D.C. Administration of bird-banding investigation in Canada has been under the jurisdiction of the National Parks Bureau since 1923.

Practically all of the birds banded in Canada are marked by voluntary co-operators who serve without remuneration from the Department, furnish their own equipment, and pay any other incidental expenses. These conservation-minded citizens operate under Dominion permits and furnish the National Parks Bureau with full details of their banding activities. Permits to band birds are issued only to persons who possess certain ornithological ability.

Much new and useful scientific information has been gathered and made available through banding and the results of studies made of this material are published in current ornithological and conservation literature. Up to December 31, 1943, a total of 440,154 records of birds that have been banded have been added to the official Canadian records and some 31,691 records of banded birds that have been recovered have been completed.

During the year 1,041 permits and licences were issued. Printed material distributed comprised 5,308 copies of the Migratory Birds Convention Act and Regulations, 12,875 Abstracts of the Regulations, 43,880 posters, and 8,466 educational pamphlets.

## GENERAL

Officers of the Wildlife Division continued active co-operation with the Subcommittee on Conservation and Development of Natural Resources. The head of the Division was appointed to membership on the Subcommittee.

## PUBLIC RELATIONS

In conformity with the policy of discouraging pleasure travel during the war, no efforts were made to induce attendance at the National Parks during the fiscal year under review. Notwithstanding this attitude on the part of the National Parks Bureau, considerable inquiry continued to be received, much of it related to visits to the parks after peace has returned. All such correspondence received prompt attention.

It is obvious that an investment so large as that which the people of Canada have in their National Parks, one which can make so large a contribution to the health and morale of the public and the Armed Forces, and which has within it the possibilities of a great contribution to the material prosperity of the country after the war, cannot be allowed to drop entirely out of the public consciousness. The growing tendency to grant holidays with pay in all forms of occupation, and the recognition that such holidays promote health and efficiency, indicate an increasing field of usefulness for the parks. The rather astonishingly large attendance in the parks during the year, mainly by Canadians from convenient surrounding territory and by military personnel on leave, indicates the extent to which this service is already being provided.

## PARKS LITERATURE

No distribution of literature was initiated by the Bureau during the year, but copies of appropriate booklets and folders continued to be supplied in response to requests. As a result of this careful husbanding of supplies no new printing of literature was necessary. Mimeographed leaflets were used to meet some special requirements. The following quantities of literature were distributed:—

|  |               |
|--|---------------|
| Atlases sold (French).....                       | 45            |
| Atlases distributed without charge (French)..... | 5             |
| Banff folder.....                                | 11,205        |
| Canada's Mountain Playgrounds.....               | 3,050         |
| Elk Island booklet.....                          | 30            |
| Cape Breton Highlands folder.....                | 220           |
| Fort Lennox Guide.....                           | 30            |
| Playgrounds of Eastern Canada.....               | 1,950         |
| Playgrounds of the Prairies.....                 | 3,000         |
| Prince Albert folder.....                        | 955           |
| Prince Edward Island folder.....                 | 180           |
| Riding Mountain folder (Information).....        | 280           |
| Jasper Park folder.....                          | 1,180         |
| Kootenay-Yoho folder.....                        | 480           |
| Waterton Lakes folder.....                       | 2,280         |
| Port Royal Habitation.....                       | 2,000         |
| Riding Mountain folder (colour).....             | 130           |
| National Parks folder.....                       | 250           |
| Fort Chambly Guide (English).....                | 200           |
| Riding Mountain booklet.....                     | 235           |
| Total.....                                       | <u>27,705</u> |

## FILMS AND LANTERN SLIDES

The Bureau's film library contains some 85 subjects, of which a total of about 1,500 prints are in stock or in circulation. No new film subjects were made during the year, but circulation of existing subjects was continued, and a number of new prints were made to replace worn out copies. Steps were taken also to co-operate with the National Film Board in taking motion pictures in park areas.

Requests for films come mainly from educational institutions, many of them in the United States. It is believed that the circulation of these films in the neighbouring republic does much to present a clearer picture of Canada than would otherwise be obtainable. There has also been a limited circulation in South Africa, New Zealand, Australia, and the countries of South America. Films are supplied on loan to any reputable organization without charge except for transportation.

According to records received in the Bureau, films were viewed during the year by 9,610 audiences totalling 1,272,793 persons, and there is also no doubt that many showings were made for which no detailed reports were received. By an arrangement with the National Film Board the Bureau receives and distributes, cleans, services, and repairs its own films. During the year 960 films were sent to borrowers in Canada and 732 to borrowers in the United States.

Hand-coloured lantern slides of Canadian scenery and related subjects are distributed on the same basis as the motion picture films. No new slides were made during the year, but distribution from the existing stock amounted to 3,070. The continued popularity of this form of educational entertainment is indicated by the fact that the above figure represents an increase of almost 50 per cent over the previous year.

## STILL PHOTOGRAPHS

The Bureau maintains a library of nearly 2,500 negatives of still photographs of scenes in the National Parks. Prints from these negatives are supplied free for publicity purposes to magazine and newspaper writers, editors, publishers, advertising services, and lithographers. During the year 1,198 photographs were distributed in this way, and, by publication in many newspapers and periodicals, attained a very large circulation. In addition, 181 enlargements were supplied for exhibition in places where they would draw attention to the National Parks.

## PRESS SERVICE

Timely articles on the National Parks and related subjects are supplied to newspapers and magazines, with or without cuts or photographs to illustrate them. Clippings received show that these articles appeared on 301 different occasions. Assistance has also been given in the compilation or checking of material for encyclopedias, guide books, and similar publications.

## EXHIBITIONS

The Bureau has not participated in exhibitions during the present year, but its exhibition material has been made available to the Exhibition Commissioner, Department of Trade and Commerce, for general exhibition purposes.

## DOMINION FOREST SERVICE

As in previous war years, the overall demand for products of the Canadian forest during 1943 greatly exceeded the available supply, in spite of the fact that the forest industries spared no effort to achieve maximum production. Chief among the obstacles confronting industry was the shortage of labour, both in the woods and in the mills. The steady drain on the available labour supply caused by enlistment in the armed forces, coupled with the natural tendency for woods workers to move to more highly paid employment in the munitions industry, resulted in acute man-power difficulties in many regions. Since adequate supplies of lumber, wood-pulp, and paper are recognized to be essential to efficient prosecution of the war, the National Selective Service organization endeavoured to induce more men to engage in their production and, towards the end of the year, these efforts appeared to be meeting with considerable success. In spite of the strained man-power situation, production of both lumber and newsprint was only 6 per cent below the 1942 level.

The tremendous and varied demand for forest products for war purposes, coupled with local shortages of wood fuel, served to focus public attention on forestry and its problems, both present and future. Even under the stress of war conditions, much thought was devoted to the formulation of plans for the rehabilitation of the forest estate after the war. In May of 1943 the provincial ministers in charge of forestry affairs laid before the Minister of Mines and Resources proposals for increased Dominion participation in this field. They stressed the need for assistance to provincial efforts in fire protection and requested increased attention to research problems. In September, the report of the Subcommittee on the Conservation and Development of Natural Resources of the Committee on Reconstruction, which included plans relating to forestry, was presented to the Dominion Government. The Assistant Dominion Forester was loaned to the Subcommittee for the purpose of consulting with the provinces as to their plans for forestry projects as one solution to employment problems during the reconstruction period. He found that there was common agreement that work projects should be concentrated on forest

protection improvements and for the provision of adequate transportation facilities for the extraction of forest products. Emphasis was placed on the fact that plans must be developed in detail well in advance so that they will be available for immediate execution at the appropriate time. Many of the provinces have completed the special studies of their forest problems.

On the basis of all this carefully prepared material decisions can be made which should lead to the establishment of forest industries on a sound basis and the perpetuation of the forests as one of the chief sources of Canada's future wealth.

During the year careful study was given to proposals advanced by several provinces that the Dominion should undertake a comprehensive plan of aerial photography to provide basic data for the compilation of a national forest inventory, as well as to assist in the planning of post-war forestry projects.

War conditions continued to limit silvicultural research work on forest experiment stations. Practically the entire time of skeleton staffs remaining was taken up in supervising the work of alternative service workers or prisoners of war employed in cutting fuel-wood, mine-props, or other forest products, to help meet existing shortages. As in previous years these operations resulted in improvements of timber stands.

The forest fire season of 1943 was the most favourable experienced for a long period of time and losses were the lowest recorded since 1918, when statistics were first compiled. This was indeed fortunate in view of the serious difficulties under which protection organizations are operating, by reason of man-power shortages and enlistments of key personnel.

As in the previous year, the Forest Products Laboratories operations were concentrated practically entirely on war work. Many of the special uses to which wood is applied under war conditions are very exacting and a great deal of investigation and research was undertaken to produce satisfactory specifications. During the year a joint mission, including representatives of the Forest Products Laboratories of Canada and the United States, visited the United Kingdom to study manufacturing methods in the production of wooden aircraft.

Pressure of departmental work forced the resignation of the Dominion Forester from his position as Deputy Wood Fuel Controller with the Department of Munitions and Supply.

### FOREST ECONOMICS

The consumption of lumber in new construction for direct military and industrial projects was somewhat less than during the previous year but the domestic demand for boxes and crates increased sharply. More lumber is now being used for packaging than for any other single purpose.

Exports of lumber to the United Kingdom were greater than during the previous year, but exports to the United States were little more than 50 per cent of the 1942 figure. The reduction of exports to the latter country, made effective under a system of export permits, was undertaken with great reluctance and only after it became clear that there was no other way in which the war requirements of both Canada and the United Kingdom could be met. Close co-operation between Canadian and United States authorities ensures that all Canadian lumber crossing the International Boundary is directed to war uses of high priority.

Distribution of Canadian wood-pulps and papers was closely controlled, and no effort was spared to ensure that the supplies available should be used to the best advantage in the joint war effort of the United Nations.

Depletion in the forests, due to utilization and to destruction by fire, was substantially reduced in 1943, because favourable weather conditions resulted

in exceptionally low losses from fire. On the other hand, a serious outbreak of the spruce budworm caused great damage to spruce and balsam in central Canada. Average annual consumption and destruction of Canada's reserves of merchantable timber, during the ten-year period 1933-42, totalled 3,933 million cubic feet of standing timber. Distribution of this total depletion is shown in the following table:—

#### Average Annual Depletion, 1933-42

|                                 | Millions<br>of Cubic Feet |
|---------------------------------|---------------------------|
| Volume used.....                | 2,789                     |
| Merchantable timber burned..... | 444                       |
| Destroyed by insects, etc.....  | 700                       |
|                                 | 3,933                     |

Approximately 71 per cent of the total depletion was used and 29 per cent destroyed. Replacement of average annual depletion requires an average growth rate of 14 cubic feet per acre over the whole accessible productive forested area of Canada. This is not a high rate of growth and certainly a far higher depletion rate could safely be maintained if our forests were managed in accordance with sound forestry principles. Only the beginnings of forest management have been introduced as yet and these are by no means universally applied. Until greatly improved forestry practices are introduced, it is not felt that Canada can safely increase her output of forest products.

The relative importance of the principal branches of forest industry in 1942 is indicated in the following table:—

#### FOREST INDUSTRIES Summary of Principal Statistics, 1942

|                               | Capital Invested | Employment    | Salaries and Wages | Net Value of Products | Gross Value of Products |
|-------------------------------|------------------|---------------|--------------------|-----------------------|-------------------------|
|                               | \$               | Man-years (1) | \$                 | \$                    | \$                      |
| Woods operations.....         | 248,000,000      | 112,600       | 156,000,000        | 173,000,000           | 234,371,891             |
| Lumber industry.....          | 112,119,272      | 47,765        | 49,562,069         | 91,206,949            | 192,919,077             |
| Pulp and paper industry...    | 655,598,196      | 38,007        | 69,656,393         | 164,500,420           | 336,697,277             |
| Wood-using industries.....    | 118,417,025      | 43,905        | 51,113,903         | 82,717,124            | 174,217,154             |
| Paper-using industries (2)... | 66,971,708       | 17,192        | 22,493,905         | 48,476,625            | 111,186,781             |
| Total.....                    | 1,201,106,201    | 259,469       | 348,826,270        | 559,901,118           | 1,049,392,180           |

(1) 300 working days. (2) Not including printing trades.

The net value of the products of the forest industries in 1942 was 4 per cent greater than in 1941, and 22 per cent greater than in 1940.

#### AERIAL FOREST SURVEYS

The Section is operating with a staff of only two men, the remainder having joined the armed forces. Urgent forest-cover mapping is being done and attention is being given to plans for post-war developments. Since aerial photography is accepted as a prerequisite for intelligent administration and development of the forest resources, post-war planning is assuming an important place in the work of the Section.

Some work has been done on forest inventory maps. Seven map sheets have been published for Nova Scotia and the work on the Petawawa Forest Experiment Station has been completed. All photos available in the Yukon were examined and a general report made on the timber there. Later a forest-cover map was made for a survey party which will be in the field in 1944.

Field work was done for the Department of Transport in connection with areas damaged by flooding, and for the Land Registry of this Department in connection with a report on Ordnance Lands. A special forest mapping project was undertaken for the Royal Canadian Air Force.

At the request of the Imperial Forestry Bureau an extensive report was prepared on the development by this Section of the application of photographs to forestry.

A paper entitled "Aerial Photographic Aids Available to the Forester" was prepared and read to the annual meeting of the Quebec Society of Photogrammetry.

Co-operation was extended to the forest industry, several members of which visited the office for advice and instruction in the application of aerial photographs to their peculiar problems.

A new device for transferring information from photos to map has been developed.

### SILVICULTURAL RESEARCH

Work of the Subcommittee on Tree Breeding of the Associate Committee on Forestry, National Research Council, composed of representatives of the Council, of the Entomological and Pathological Divisions of the Department of Agriculture, and of the Dominion Forest Service, is progressing favourably. These investigations cover development in technique in treatment of seeds, seedlings and cuttings, in nursery and plantation methods, and in selection of high-quality strains and species. Strains of white pine that give promise of resistance to weevil and blister rust, poplar suitable for pulpwood and match stock, and for prairie shelterbelt planting, and spruce of rapid growth are receiving particular attention.

New developments have been made in the technique of establishing sample plots and in the methods of compiling the data.

Thinnings, improvement cuttings and harvest cuttings have been conducted at all stations to provide material for war needs. The effect of such cuttings is being studied by means of permanent and transect sample plots. Many such plots which have been established five or more years were remeasured.

Further assistance was given to provincial and private organizations in establishing transect sample plots to study the development of cut-over pulpwood forests.

In co-operation with the Department of Agriculture, an examination was made of the woodlots on experimental farms and illustration stations in the Maritime Provinces, to study the possibilities of managing them for sustained yield.

A series of radio talks on management of farm wood-lots was prepared for the Department of Agriculture.

Assistance was given the National Parks Bureau in directing cutting operations on the Riding Mountain National Park, in accordance with the working plan.

### FOREST PROTECTION

The fire season of 1943 was the most favourable since compilation of national forest fire statistics began in 1918. The number of fires (3,370) and total damage and costs (\$952,872) were the lowest on record. The area burned (827,830 acres) was the smallest since the 471,878 acres recorded in 1927; in that year, however, the damage and cost amounted to \$1,350,228. In 1943 the losses were uniformly much below average in all provinces, as will be seen by reference to Table IV.

The proportion of fires attributed to railway causes (15 per cent) was the highest since the period prior to 1930 when railway fires were being brought under rigid control. All provinces, with the exception of New Brunswick, Manitoba, and Saskatchewan, showed a sharp increase in the number of railway fires. This increase may probably be attributed to greatly increased railway traffic and the use of some obsolete or defective equipment, made necessary by wartime demands upon the railways. Labour shortage for proper inspection and repair of defective equipment may also have been a factor. Smokers' fires show a slight increase in several provinces.

All regions reported well-distributed rainfall throughout the season, with only occasional brief periods when fire hazards developed. It is not, therefore, deemed necessary to describe the fire season by regions.

### FOREST-FIRE RESEARCH

The work was again curtailed owing to shortage of staff. The eighteen forest weather stations used in National Parks in Western Canada to compute the daily index of fire hazard in each region were supervised by the aid of duplicate records mailed to the Petawawa Forest Experiment Station. At the latter station, routine studies on basic principles of fire-hazard measurement and on the improvement of equipment and technique for determining an index of fire hazard were continued.

TABLE I

Forest Fire Losses in Canada, 1943, Compared with 10-Year Average 1933-42

| Item                                | Annual Averages 1933-42 | Year 1943 |
|-------------------------------------|-------------------------|-----------|
| Fires under 10 acres..... number    |                         | 2,355     |
| Fires 10 acres and over..... "      |                         | 1,015     |
| Total number of fires.....          | 5,835                   | 3,370     |
| Area burned—                        |                         |           |
| Merchantable timber..... acres      | 548,147                 | 87,809    |
| Young growth..... "                 | 659,335                 | 99,234    |
| Cut-over lands..... "               | 375,582                 | 85,074    |
| Non-forested lands..... "           | 783,050                 | 555,713   |
| Total area burned..... "            | 2,366,114               | 827,830   |
| Merchantable timber burned—         |                         |           |
| Saw timber..... M ft. b.m.          | 753,355                 | 86,302    |
| Small material..... cords           | 2,398,217               | 278,075   |
| Estimated values destroyed—         |                         |           |
| Merchantable timber..... \$         | 2,565,445               | 251,821   |
| Young growth..... \$                | 900,239                 | 181,085   |
| Cut-over lands..... \$              | 271,099                 | 65,423    |
| Other property burned..... \$       | 361,925                 | 271,882   |
| Total damage..... \$                | 4,098,708               | 770,211   |
| Actual cost of firefighting..... \$ | 850,766                 | 182,661   |
| Total damage and cost..... \$       | 4,949,474               | 952,872   |

TABLE II

Forest Fires in Canada, 1943, by Causes Compared with 10-Year Average 1933-42

| Cause                      | Average 1933-42 |     | Year 1943 |     |
|----------------------------|-----------------|-----|-----------|-----|
|                            | No.             | %   | No.       | %   |
| Camp-fires.....            | 1,072           | 18  | 568       | 17  |
| Smokers.....               | 947             | 16  | 677       | 20  |
| Settlers.....              | 937             | 16  | 434       | 13  |
| Railways.....              | 238             | 4   | 494       | 15  |
| Lightning.....             | 1,034           | 18  | 432       | 13  |
| Industrial operations..... | 144             | 2   | 136       | 4   |
| Incendiary.....            | 390             | 7   | 87        | 2   |
| Public works.....          | 59              | 1   | 25        | 1   |
| Miscellaneous known.....   | 439             | 8   | 329       | 10  |
| Unknown.....               | 575             | 10  | 188       | 5   |
| Totals.....                | 5,835           | 100 | 3,370     | 100 |

TABLE III  
 Statistics of Forest Fires by Regions, 1943  
 (Averages given are those for 10-year period 1933-42)

|                                | British Columbia |         | Alberta   |         | Saskatchewan |        | Manitoba |        | Ontario   |         |
|--------------------------------|------------------|---------|-----------|---------|--------------|--------|----------|--------|-----------|---------|
|                                | Average          | 1943    | Average   | 1943    | Average      | 1943   | Average  | 1943   | Average   | 1943    |
| Fires—                         |                  |         |           |         |              |        |          |        |           |         |
| Total number.....              | 1,595            | 1,185   | 324       | 265     | 266          | 87     | 391      | 153    | 1,427     | 624     |
| Caused by lightning..... %     | 35               | 22      | 4         | 0       | 6            | 2      | 9        | 7      | 23        | 16      |
| Areas burned—                  |                  |         |           |         |              |        |          |        |           |         |
| Merchantable timber..... acres | 53,855           | 3,087   | 149,202   | 47,130  | 59,390       | 2,631  | 37,635   | 2,070  | 144,016   | 14,905  |
| Young growth..... “            | 62,870           | 12,977  | 186,956   | 49,256  | 248,119      | 4,314  | 34,730   | 3,420  | 68,164    | 20,035  |
| Cut-over lands..... “          | 152,155          | 34,368  | 16,977    | 9,260   | 18,766       | 5,094  | 3,969    | 1,674  | 30,294    | 8,450   |
| Non-forested lands..... “      | 78,795           | 44,410  | 201,028   | 409,503 | 187,649      | 22,061 | 157,282  | 30,936 | 93,297    | 9,427   |
| Total..... “                   | 347,675          | 94,842  | 554,163   | 515,149 | 513,924      | 34,100 | 233,616  | 38,100 | 335,770   | 52,817  |
| Damage..... \$                 | 820,348          | 132,927 | 914,772   | 208,418 | 227,674      | 9,624  | 144,439  | 12,758 | 944,070   | 130,976 |
| Cost of fire-fighting..... \$  | 194,066          | 35,358  | 82,756    | 18,679  | 70,472       | 4,590  | 32,402   | 2,284  | 237,068   | 63,353  |
| Total damage and costs..... \$ | 1,014,414        | 168,285 | 1,997,528 | 227,097 | 298,146      | 14,214 | 176,841  | 15,042 | 1,181,138 | 194,329 |

|                                | Quebec    |         | New Brunswick |        | Nova Scotia |       | Dominion Lands |       |              |        |                     |      |
|--------------------------------|-----------|---------|---------------|--------|-------------|-------|----------------|-------|--------------|--------|---------------------|------|
|                                |           |         |               |        |             |       | National Parks |       | Indian Lands |        | For. Expt. Stations |      |
|                                | Average   | 1943    | Average       | 1943   | Average     | 1943  | Average        | 1943  | Average      | 1943   | Average             | 1943 |
| Fires—                         |           |         |               |        |             |       |                |       |              |        |                     |      |
| Total number.....              | 1,103     | 699     | 253           | 181    | 345         | 101   | 72             | 23    | 54           | 46     | 7                   | 6    |
| Caused by lightning..... %     | 5         | 6       | 4             | 9      | 0           | 0     | 11             | 13    | 13           | 2      | 14                  | 0    |
| Area burned—                   |           |         |               |        |             |       |                |       |              |        |                     |      |
| Merchantable timber..... acres | 84,821    | 11,381  | 7,749         | 377    | 1,456       | 8     | 6,209          | 3,852 | 3,410        | 2,359  | 449                 | 9    |
| Young growth..... “            | 22,186    | 5,720   | 5,928         | 455    | 6,131       | 348   | 21,211         | 300   | 2,254        | 2,409  | 875                 | 0    |
| Cut-over lands..... “          | 137,434   | 24,896  | 10,012        | 453    | 1,177       | 629   | 4,094          | 228   | 664          | 10     | 45                  | 12   |
| Non-forested lands..... “      | 19,374    | 6,309   | 22,738        | 1,002  | 8,785       | 455   | 10,312         | 1,113 | 3,206        | 30,497 | 671                 | 0    |
| Total..... “                   | 263,815   | 48,306  | 46,427        | 2,287  | 17,549      | 1,440 | 41,826         | 5,493 | 9,534        | 35,275 | 2,040               | 21   |
| Damage..... \$                 | 868,421   | 249,088 | 75,356        | 11,405 | 23,433      | 1,238 | 61,694         | 3,247 | 12,940       | 10,081 | 6,182               | 449  |
| Cost of fire-fighting..... \$  | 163,951   | 51,188  | 24,270        | 1,394  | 23,362      | 2,289 | 17,438         | 1,259 | 4,521        | 2,252  | 590                 | 15   |
| Total damage and costs..... \$ | 1,032,372 | 300,276 | 99,626        | 12,799 | 46,795      | 3,527 | 79,132         | 4,506 | 17,461       | 12,333 | 6,772               | 464  |

TABLE IV

*Fire Season, 1943—Comparative Statement by Regions*

| Region             | Increase or Decrease in Relation to Average for Period 1933-42 |                    |                  | Proceedings Under Provincial Fire Laws |             | Deaths |
|--------------------|--|--------------------|------------------|--|-------------|--------|
|                    | Number of Fires  | Area Burned, Acres | Cost Plus Damage | Prosecutions                           | Convictions |        |
|                    | %  | %                  | %                |  |             |        |
| British Columbia.. | - 26   | - 73               | - 84             | 17                                     | 17          | 0      |
| Alberta.....       | - 18   | - 7                | - 89             | 66                                     | 59          | 0      |
| Saskatchewan.....  | - 67   | - 93               | - 95             | 17                                     | 16          | 0      |
| Manitoba.....      | - 61   | - 84               | - 92             | 0                                      | 0           | 0      |
| Ontario.....       | - 56   | - 84               | - 83             | 7                                      | 7           | 0      |
| Quebec.....        | - 37   | - 82               | - 71             | 13                                     | 12          | 0      |
| New Brunswick..... | - 28   | - 95               | - 87             | 13                                     | 12          | 0      |
| Nova Scotia.....   | - 71   | - 92               | - 92             | 1                                      | 1           | 0      |
| Canada.....        | - 42   | - 65               | - 81             | 134                                    | 124         | 0      |

## ALTERNATIVE SERVICE WORK

## DOMINION FOREST EXPERIMENT STATIONS

By arrangement with the Department of Labour, conscientious objectors were again employed at alternative service work camps at the Petawawa and Kananaskis Forest Experiment Stations. These men were employed as a first line of defence against forest fires at a time when casual labour was very scarce, and were also used on the improvement and maintenance of roads, buildings, and telephone lines, timber extraction for fuel-wood, mine-props, and other material for military use and for sale, forest nursery work, tree-planting and silviculture, all under the direction of technical officers of the Dominion Forest Service.

The number of workers at Kananaskis Station varied from 43 to 126 with an average of 83 per month, and in addition to fire protection and maintenance work they produced 4,255 cords of fuel-wood, 6,600 linear feet of fence-posts and 2,427,000 linear feet of coal-mine props. At Petawawa Station the number of workers varied from 24 to 109 with a monthly average of 52. In addition to other work they produced 4,650 cords of fuel-wood, 1,136 cords of pulpwood, and 55,300 feet board measure of sawlogs. These men worked a total of 21,087 man-days at Kananaskis, and 14,294 man-days at Petawawa.

## BRITISH COLUMBIA

Under agreement between the Dominion Department of Labour and the Department of Lands of British Columbia, conscientious objectors were again employed in British Columbia to perform alternative service work in the protection and conservation of the provincial forests against destruction by fire through possible enemy action or sabotage. The agreement also provided that these workers, when not actively engaged in forest fire protection, would be used for the production of domestic wood fuel to relieve an acute shortage.

The Lands, Parks and Forests Branch of the Department of Mines and Resources acted on behalf of the Minister of Labour in all matters relating to the location of work camps, assignment of men thereto, the inspection of operations, and the certification of accounts for payment.

Twenty work camps were operated during the year with a maximum number of workers in any one month of 507, a minimum of 217, and an average



of 411. The men were used as a first line of defence for fire-fighting and were employed on 149 fires. They were also engaged in the construction and maintenance of forest roads and trails and other improvements in the interest of forest protection and conservation. A total of 196,242 "snags" (dead standing trees which burn freely and may disperse flaming embers over long distances) were cleared from 17,286 acres. Road work, to provide access to logged-over areas for fire-fighting and administration, comprised about 7 miles of new road construction, 62 miles of old road improvement, 42 miles of abandoned logging railway grade converted to motor road, 351 culverts, and 15 bridges. The men also planted 11,678,050 tree seedlings, performed valuable tree nursery work, and produced 11,105 cords of fuel-wood.

On March 31, 1943, all workers in the camps, together with any absentees, were discharged because of the termination of the agreement.

#### PRISONER OF WAR LABOUR

Prisoner of war and internee labour employed on Dominion Forest Experiment Stations performed useful road construction and maintenance and the salvage of material in silvicultural operations under the direction of forest officers. This labour resulted in the production of about 9,000 cords of fuel-wood and 500,000 linear feet of coal-mine props.

Fuel-wood cut by Canadian soldiers at one Forest Experiment Station, to relieve the fuel shortage, amounted to over 6,500 cords.

#### FOREST PRODUCTS LABORATORIES

Problems connected with the prosecution of the war have constituted the principal activities of the Forest Products Laboratories at Ottawa and Vancouver, and of the Pulp and Paper Research Institute at Montreal. There has been an urgent demand for timber, plywood, pulp, paper, fibreboard, insulating board, and various wood fibre materials for a wide variety of purposes both in Canada and abroad. Many of the special uses to which such material is now being applied are very exacting and a great deal of investigation has frequently been required before satisfactory specifications could be prepared, particularly in the case of aircraft. A great deal of the work was carried out in direct collaboration with the armed forces or with departments engaged in the supplying of war materials. Assistance was also extended to war industries in improving techniques in their processes, in developing alternative materials and methods, and in curtailing waste.

Following is a brief report on some of the more important matters which have received attention during the year. For obvious reasons reference to much of the confidential work which has been undertaken has had to be omitted.

#### MAIN LABORATORIES—OTTAWA

##### DIVISION OF TIMBER MECHANICS

Much of the work of this Division has been carried on in close collaboration with the defence services. In large part it has dealt with the use of wood in aircraft and in military and naval construction, and has resulted in either improved quality of material or more adequate specifications. Much time was also given to the great variety of adhesives now in use, with particular reference to the wide range of atmospheric conditions likely to be encountered.

The investigation of temperature and humidity under dispersal conditions in various parts of wooden aircraft wings was undertaken. This is a co-operative investigation being carried out at two stations in Canada, similar work being carried on in the United States, Australia, South Africa, India, and the United Kingdom.

The shortage of balsa wood for sandwich-type construction in aircraft has stimulated interest in cellular construction as a substitute, and a number of very promising types have been developed at the Laboratories, and submitted for consideration. Another recent development is the construction of timber beams and trusses with plywood webs. Tests on a number of such constructions indicated that present shear test figures must be taken with reserve, and further testing to arrive at accurate data is contemplated.

The increasing difficulty of securing large structural timbers emphasized the possibility of substituting therefor, in certain cases, members built up of small timbers by the use of various adhesives. Such a procedure would provide an outlet for considerable low-grade material of low economic value. To investigate the many problems involved an experimental press for fabricating large beams is under construction.

The increasing use of plastics opens up a wide field for forest products. Research in connection with plastic-impregnated papers was continued; the production of a thermo-plastic phenolic resin has introduced new possibilities in the paper-plastics field, as this material will take impressions readily while hot, yet sets hard at room temperature. A special high-pressure press was installed, to permit more comprehensive investigation of the dense compressed wood which is replacing metal for many purposes.

Considerable time was given to the design and testing of a variety of containers in various materials for the Department of Munitions and Supply, the Directorate of Ordnance Services, the Inspection Board of the United Kingdom and Canada, and various shippers of war materials. In view of the increasing demand for corrugated containers, attention was given to the development of standard tests, in co-operation with the American Society for Testing Materials.

During the year a joint mission from the Canadian and United States Forest Products Laboratories visited the United Kingdom to study manufacturing methods in the production of wooden aircraft. Much valuable information was secured.

##### DIVISION OF WOOD PRESERVATION

The Division undertook as a special project the development of processes for moulding plywood to double curvature. Dispersal of production of parts for wooden aircraft is very desirable and attention was concentrated on methods suitable for use in small shops with limited equipment. Parts for aircraft and small boats were made to demonstrate the possibilities of the processes developed.

The large number of wood products of widely differing character used by the armed services in every conceivable climate, and frequently under most adverse conditions, makes the question of protection from decay, insect attack, and fire, of first importance. Assistance on these matters was rendered in connection with the treatment of such items as boxes, poles, construction timbers, culverts, and many small items. Tests on treated timbers were carried out for the Department of Public Works, and tests of fire-retardant paints for use on wooden buildings were continued. Reports on service life of timbers under observation were received from engineers throughout Canada, a total of 832 items being listed. Of these, 679 are still active, the remainder being discontinued for a variety of causes.

##### DIVISION OF WOOD CHEMISTRY

The synthetic rubber program has greatly increased the demand for ethyl alcohol, one potential source of which is wood waste. In co-operation with the United States Forest Products Laboratory, work was carried out at a pilot-scale plant designed for recovery of alcohol by the Scholler process. The experiments indicated that native species give results fully comparable to those

secured with European woods, while it was found that slight modifications of the original process would probably give better yields in a shorter time. As the Scholler process hinges on the production and fermentation of wood sugars, this aspect was given considerable study, and a small laboratory-scale plant was designed to further the investigations. This plant will also furnish a supply of lignin residue, a by-product at present chiefly used for fuel, but which may have application in the field of plastics. It seems quite possible that the existence of a wood hydrolysis industry on this continent after the war will depend on finding a profitable use for lignin residue. Reports on both angles of the problem were prepared.

Two hundred gallons of pine-tar obtained from Douglas fir mill waste were sent to a firm outside Canada for testing as a softener in the manufacture of tires from natural rubber. An entirely satisfactory report was received. Tentative specifications for wood charcoal for use in gas-producers for internal combustion engines were prepared and submitted to the Subcommittee on Producer Gas, National Research Council.

#### DIVISION OF LUMBER SEASONING

The problem of obtaining properly seasoned lumber in sufficient quantities was in many cases a difficulty in the manufacture of war materials. Assistance was rendered by the Laboratories to industry in improving the operation of dry-kilns and in increasing output. Several charges of material required by the war services for the manufacture of special equipment were seasoned in the Laboratories' dry-kilns.

During the year, information on lumber seasoning problems was supplied to both government and commercial organizations as requested. Some of the subjects treated are as follows: operation of dry-kilns to prevent case-hardening, checking or other defects; the correct moisture content to which interior wood-work should be dried in specific cases; drying schedules for birch aeroplane propeller stock; summer storage of yellow birch and white birch veneer logs so as to obviate checking and the development of stain and decay; the feasibility of drying shingles with infra-red light; designs of natural-draft dry kilns for specific cases where it was impracticable to erect forced-circulation kilns; information on the use and limitations of electric moisture meters; schedules for drying Brazilian boxwood, walnut rifle furniture, jack pine, and other species; schedule for drying select white pine to prevent brown stain.

#### DIVISION OF TIMBER PATHOLOGY

Twenty creosoted red-stained jack pine railway ties manufactured and tested in 1926 were removed from an experimental track in which they had been in service for fourteen years, and were analyzed. Externally the ties showed little evidence of deterioration; but when they were cut up and examined advanced brown rot was found established at the base of checks in about half of the ties.

Cultures were made from the ties. *Trametes pini*, causal agent of red stain and white pocket rot, was found alive but dormant in five ties. *Lentinus lepideus* was isolated from four ties and was probably responsible for most of the brown rot in the ties; *Trametes americana* was obtained from one tie.

Two piles of red pine poles were examined for the distribution of stain and decay defects. The piles contained spring-cut spring-peeled, and winter-cut spring-peeled poles. To eliminate stain it was recommended that the piles be raised to allow better circulation of air, and that they be roofed.

Inquiries relating to fungal defects in wood have been dealt with during the year. These had reference to storage of logs and of fuelwood, discolorations in plywood and veneer, decay in building timbers and in exposed timbers, methods of controlling sapwood stain, and relative durability of different species.

#### DIVISION OF TIMBER PHYSICS

Special reports on defects of veneer, variation in basic density of Canadian pine, and causes of separation of the plywood skin from the frame in aeroplane wings were prepared for the Royal Canadian Air Force. In company with a representative of the Air Force, a representative of the Laboratories visited a number of plants making wooden planes, or parts therefor, to advise on various technical problems. Considerable information relating to various woods was supplied the Department of National Defence, for the engineering branch of which a special report on European species which may have to be utilized was prepared. Certain military buildings, in which defects due to the employment of green lumber had developed, were inspected, and advice as to remedies was given.

At the annual meeting of the Canadian Pulp and Paper Association there was presented a paper giving the results of an investigation into bark removal by chemical treatment. A freshly prepared mixture of arsenic trioxide and caustic soda, applied in paste form to the base of standing trees after removal of a strip of bark, was found extremely effective on most of the species used for pulp, poplar, and black spruce showing greater resistance. The investigation is continuing.

On account of the increasing difficulty of obtaining adequate supplies of rock elm for use for highly specialized purposes in the domestic and export markets, attention was given to the practicability of including with rock elm the higher-density white elm (*Ulmus americana*).

The Division collaborated with a subcommittee of the Canadian Engineering Standards Association in the preparation of a standard for loose wood fibre insulation, following work on the value of sawdust and shavings for this purpose done by the Laboratories. Special memoranda on the fuel values of wood and certain briquetted fuels produced in the United States were prepared for the Fuel Controller.

#### VANCOUVER LABORATORY

The Vancouver Laboratory is operated as a branch of the Ottawa Laboratories, in co-operation with the University of British Columbia. The work is directed toward the more efficient utilization of British Columbia woods, and during the year attention has been devoted almost entirely to problems connected with the prosecution of the war.

#### DIVISION OF TIMBER MECHANICS

The Division was in more or less constant collaboration with the Royal Canadian Air Force, British Ministry of Supply, Inspection Boards, and Timber Control, on problems arising from war needs. Numerous consignments of aircraft woods were inspected before shipment, and a large number of tests were carried out, chiefly on glues and glued joints in connection with aircraft manufacture. It was found that certain specifications were restricting the use of several western species in aircraft construction. Consultation with officials of the organizations concerned cleared up a number of disputed points and resulted in an improved product.

Testing occupied a large part of the time of the staff. Static bending tests were carried out to determine the comparative influence of various defects on Douglas fir and western hemlock. The latter material in aircraft quality was also subjected to tests to determine the effect on strength of kiln-drying to various schedules. New types of test specimens, designed to determine ultimate shear loads for plywood panels and for tests in direct shear were investigated as possible alternatives to the present direct tension test for plywood. Other tests covered glues and glued joints; light-weight built-up boards designed for naviga-

tion tables, bomber runways, and other uses where minimum weight and maximum strength are desirable; standard tests on one shipment of amabilis fir in green condition, and one of air-dried yellow cedar.

In co-operation with the United States Forest Products Laboratory and two sawmills a study of gluing-up smooth-sawn material direct from the saw was undertaken; the United States Army Engineer's office at Edmonton was advised regarding commercial wood species available along the Alaska Highway.

#### DIVISION OF TIMBER PRODUCTS

The detection of incipient decay in wood, especially that designed for aircraft construction, is of first importance. With a view to developing more expeditious methods of detection, a study was undertaken to determine the degree of fluorescence of six wood-destroying fungi commonly found in Sitka spruce. Efficient kiln-drying appears the most promising means for checking the growth of fungi during storage. To determine the growth of several of the more important fungi attacking spruce, sterile test sticks were inoculated and maintained under laboratory conditions. Study of "brown streak" in aircraft quality western hemlock showed the condition to be fairly common, and to be generally associated with local high moisture content. This species was the subject of studies to determine a satisfactory kiln-drying schedule which will not impair the strength of the wood. A study of rot in western red cedar shingle roofs indicated greater durability for brush-coated shingles laid over spaced sheathing than for undipped shingles over close sheathing.

Both urea and common salt are now used in the chemical seasoning of timber, and the question as to their effect on metal fastenings and on paint or varnish has arisen. Roof panels indicated little or no effect of either treatment on surface coatings; fastenings did not appear to be affected by urea, but showed considerable corrosion where common salt was used, especially in exposed situations.

Miscellaneous problems dealt with during the year included: investigation of rate of end absorption of moisture in Douglas fir veneer logs; establishment of suitable drying schedules for western hemlock broom handle stock, to avoid raised grain; study of treated battery separators of Port Orford cedar, yellow cedar, and Douglas fir, to determine relationship, if any, between moisture content, shrinkage, and shipping weight; study of streaky heart in Douglas fir, which appeared to be correlated with higher tannin content, but to have no connection with metallic elements present in the wood; study of comparative buoyancy of kapok and balsa, with reference to naval life-rafts and floats; data on suitability of British Columbia species for masts and spars; data on use of sawdust and shavings for insulation, particularly with respect to condensation of moisture, harbouring of vermin, and fire-resistance; the microscopic identification of wood samples; the cause of warping in finished furniture in the Prairie Provinces; drying maple frames for army pack boards; developing seasoning schedules for Garry oak; cedar shingle mill waste utilization; the cause of elliptical warping in maple knobs seasoned for navy use; problems affecting the production of charcoal and producer-gas plant operation; and potential resistance to decay of western hemlock, creosote-treated without pre-drying.

#### PULP AND PAPER RESEARCH INSTITUTE OF CANADA

The Montreal Laboratory of the Forest Products Laboratories is a part of the Pulp and Paper Research Institute of Canada. The Dominion Government, the Canadian Pulp and Paper Association, and McGill University jointly support the Institute, the research work being under a General Director who is responsible to a Joint Administrative Committee consisting of representatives of the three constituent bodies.

#### FUNDAMENTAL RESEARCH STUDIES

Much of the work done during the past year was devoted to the determination of the structure of lignin and to the validation of the theory of its nature and chemical behaviour developed at the Institute. Some of the investigations produced results of value in the field of plant biology. All this work on lignin has gained wide recognition as an important contribution in this field and is acknowledged in a standard annual review on the progress of chemistry. These fundamental researches on lignin are necessary for a thorough understanding of the mechanism underlying chemical pulp manufacture.

Work was commenced on two important studies of cellulose involving the measurement of its colloidal surface and the mechanism of its oxidation.

#### APPLIED RESEARCH STUDIES

Progress was made in the development of an optical method of measuring the printing smoothness of paper, in spite of wartime delays in obtaining suitable photo-cells, optical parts, and minor electrical supplies. Information was obtained regarding the obstacles likely to be met when a practical instrument for mill use has to be designed. Nothing has as yet affected the soundness of the basic idea. The Weymouth method of trial printing was also used and gave results by visual grading which compared favourably with those obtained with the optical instrument.

An instrument for measuring the folding quality of box board was developed for use at the Institute, but it is not yet in a form suitable for use elsewhere. It is primarily designed to crease board under conditions such as obtain in a platen press, but with certain conditions subject to controllable variation. The creasing arrangement has been developed so that all the main factors can be subjected to variations of known degree. Humidity was found to be very important, low humidity being adverse to good creasing and folding. For the present, the instrument will be used to study the technique of folding in general so as to aid box-makers in getting better results.

A study was made of the rate of diffusion into wood of solutions of chemicals used to produce sulphite pulp. It was found that the rates of diffusion along the grain and across the grain of the wood changed in such a way during the course of the cooking action as to make the thickness of each chip of wood as important a factor in the process as its length.

The effects of the moisture content of wood and of its age after being cut, in relation to the conditions of grinding and the quality of the pulp produced, were investigated. Four species of wood were used.

A study was completed on the efficiency of present methods of hauling pulpwood by horse and sleigh, which showed the possibility of effecting considerable economy in this phase of pulpwood operations.

Miscellaneous investigations included another series of tests of pulp in connection with a study of the preparation of pulp for board; a series of tests to verify the theory of the selective screen pulp classifier; and the development of a method of measuring the freeness of pulps containing a large proportion of fine material.

A great number of reference tests were made on samples submitted by the industry and many check tests were made on instruments of types used exclusively by the industry.

#### WAR WORK

Valuable assistance was given to the Government on problems connected with the war which required the use of the special equipment at the Institute or the special qualifications of Institute staff in both fundamental and applied research.