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## ESTIMATED AREA SOWN TO CROPS IN DOMINION

Wheat Shows for Whole of Canada Total of 16,900,000 Acres, Two Per Cent Decrease Over 1918.

### UNITED STATES CROP

The Dominion Bureau of Statistics has issued the first or preliminary estimate of the areas sown to grain and hay crops this spring, as compiled from the returns of crop correspondents.

Wheat shows for the whole of Canada an estimated total area of 16,958,500 acres, as compared with 17,353,902 acres in 1918, a decrease of 395,402 acres, or 2 per cent. In 1918 the area sown was 1,477,150 acres, or 10 per cent, more than the area of 1917. Owing to the mildness of the winter of 1918-19, the area to be harvested of fall wheat is 797,750 acres, representing 381,135 acres, or 91 per cent, more than in 1918. The area sown to spring wheat is 16,160,750 acres, representing 776,537 acres, or 5 per cent, less than in 1918. Of oats the total area sown is 14,654,000 acres, which is 136,000 acres, or 1 per cent, less than in 1918. The acreage of the remaining crops is as follows: Barley, 3,036,240 acres, as compared with 3,153,711 acres in 1918; rye, 575,585 acres, as against 555,294 acres; peas, 208,250 acres, as against 235,976 acres; mixed grains, 877,240 acres, as against 921,826 acres; hay and clover, 10,472,700 acres, as against 10,544,625 acres; and alfalfa, 192,480 acres, as against 196,428 acres. This year reports on potato planting were asked for a month earlier than heretofore, and the replies indicate an area under potatoes of 692,900 acres, as compared with 735,192 acres last year, a decrease of 42,292 acres, or 6 per cent. Potato planting had not made much progress in the Maritime Provinces and in Quebec at the end of May, so that the estimate must be considered as of very tentative character.

### ACREAGE OF PRAIRIE PROVINCES.

The area sown to wheat in the three Prairie Provinces totals 15,450,700 acres, as compared with 16,125,451 acres last year; to oats, 9,614,000 acres, as compared with 9,354,941 acres; to barley, 2,162,000 acres, as compared with 2,272,334 acres; and to rye, 436,000 acres, as against 411,846 acres. By provinces

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## REPORT EXPLAINS BASIS OF \$10,000,000 BONUS

Explains Accepted Method of Measuring Changes in Cost of Living and Indicates Amount of this Increase in Canada on Average Person.

The Civil Service Commission published on July 28 the report on which the payment of the \$10,000,000 bonus to Government employees is based.

The report explains the accepted method of measuring changes in the cost of living, shows the effect which increases in Canada have had on the income of the average person, and indicates the method of computing the new bonus.

It is stated that \$1,000 a year supported a family of five in moderate comfort before the war, while \$1,550 would be needed to-day, as the cost of living was increased more than 53 per cent.

A bonus of \$420 a year to householders with an income of \$1,200 or less is recommended and a proportional bonus to persons without dependents. From this point the bonus scales downwards according to a fixed percentage.

The report is as follows:—

In compliance with instructions given by the Civil Service Commission, a report was submitted by the Organization Branch, as to the basis on which payment of bonus to Civil Service employees should be made for the current year. The body of the report is reproduced below, the introductory paragraphs and the appendices, containing the details summarized in the report, being omitted.

The report explains the accepted method of measuring changes in the cost of living and indicates the amount of this increase in Canada, deals with the effect of this increase on the real

income of the average person, indicates the income necessary for the support at a reasonable minimum standard of comfort of a married or single person, and indicates the methods of computation and limits of application of the bonus.

### 1. Cost of Living in Canada.

The commonly accepted method of showing changes in prices, is by means of an index number, in which the trend of prices of a list of representative articles is taken as an index to the price changes of the whole group of articles under consideration. Comparison may be made either by showing the average or the aggregate price of this list at any given period as a percentage of the price of the list at a year or period taken as a base for comparison, or by showing the price as a money amount which may be compared directly with the price in any previous year.

Where the group of articles being studied is affected in somewhat similar fashion by common causes, as for example, agricultural products are influenced by crop conditions, it is sufficient to take the simple average price of a few of the more important of these products, as an index to the price fluctuations of all. Where, however, varying groups are included, such as the food,

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## GRAIN MOVEMENTS IN MIDDLE WEST

Report From Immigration Department Gives Total Bushels Inspected.

The Department of Immigration and Colonization have received the following report on grain movements from their Winnipeg office:—

Grain in store at Government interior elevators: Moosejaw, 561,525 bushels; Saskatoon, 719,762 bushels; Calgary, 522,182 bushels.

In store C.P. interior elevators, 2,925,498 bushels; 1918, 1,661,789 bushels.

In store all elevators at lake front, 6,007,879 bushels.

Inspected since September 1, 1918:—

Wheat. Other grains. Total.

1918— 121,347,600 45,683,900 167,001,500

1917— 151,962,000 76,808,200 228,770,200

Grain shipped by rail since September 1, 1918: C.P. tracks, 7,369,193 bushels; lake front, 9,027,106 bushels.

Grain shipped by boat and rail since September 1, 1918: C.P. tracks, 68,895,296 bushels; lake front, 105,286,881 bushels.

Grain shipped by boat since opening of navigation, April 15, 1919: C.P. tracks, 24,524,425 bushels; lake front, 46,003,822 bushels.

During the week 421 cars of flour were shipped from various mills in the Prairie Provinces; last year, 424 cars.

## SETTLERS FROM U.S. SHOW INCREASE DURING JUNE.

During the month of June there entered Western Canada from the United States 2,029 persons with cash \$1,214,050, effects \$110,646; last year, 1,527 persons with cash \$804,609, effects \$100,024. Nationality: British, 72; Canadian, 87; American, 1,665; Russian, 15; Scandinavian, 148; others, 42.

Their occupations were: Farmers, 661; farm and other labourers, 151; mechanics, 92; railroaders, 57; clerks, 56; domestics, 34; miners, 9; professional, 53; women and children, 817; not classified, 99.

## REPORT IS OF GREAT VALUE TO GRAIN TRADE

Internal Trade Division of Bureau of Statistics Has Issued Report Detailing Movements of Grain.

### TWO MAIN AREAS

A report on the grain trade of Canada, which includes many new and valuable features, has recently been issued by the Internal Trade Division of the Dominion Bureau of Statistics.

It is the object of the report to show in full detail the movements of grain in Canada from the producer to the final markets. The report represents a considerable enlargement on previous statistics and is the first attempt to deal with the subject of the grain trade comprehensively.

To simplify the marketing of Canadian grain, the country is divided into two main areas, the eastern and the western, the dividing line being at Port Arthur and Fort William, which localities are included in the western field. As representing the grain which is subject to movement during any year (the year covered by the report is the crop year ending August 31, 1918), the following items are taken: Current production and the quantity in store at the beginning of the crop year in country elevators and in terminal elevators at the head of the lakes. The statistics then illustrate the movements of this grain through the several channels until it is finally disposed of, either by shipment from the head of the lakes, by rail from Fort William and Port Arthur over the international border into the United States, or by water from Vancouver. Similarly in the eastern division, the current crop and the amount on hand in eastern elevators, together with the receipts from the West, are traced from stage to stage, either to local consumption or to export to the United States, the United Kingdom, and other countries. Among the new features for Canadian grain statistics is the method which has been adopted of presenting the handlings of grain by means of the form of balance sheets for the large grain centres, for the western and eastern divisions of the country and for Canada as a whole. This not only serves to bring the various data into such close relations as almost automatically to check their accuracy, but the process of collecting the data has imposed a rigorous check upon the agents supplying the information and so increased the accuracy of the statistics. Another new feature is the intimate following up of all the major movements of wheat eastward into consumption or for export. This latter work has been elaborated in the detailed statistics and presented graphically by means of a map in such form that it may readily be appreciated even by the non-technical.

# REPORT EXPLAINS BASIS OF \$10,000,000 BONUS

## Explains Accepted Method of Measuring Changes in Cost of Living and Indicates Amount of this Increase in Canada on Average Person.

[Continued from page 1]

clothing, rent, fuel and light, and sundries consumed by the average family, it becomes necessary to weight the items composing the representative list, proportionately to their importance of consumption. For this purpose the method now in use by the Department of Labour of Canada is to construct a representative family budget, and to compute a cost of living index number as the sum of the retail costs of the various amounts of food, fuel, etc., used by the normal family. Clothing and sundries are not included in the budget of the Labour Department, but on the basis of the figures regularly published in the *Labour Gazette*, we can obtain official information as to the fluctuations in cost of food, heat and light, and rent, that is of the items composing about two thirds of the expenditure of the average family. On the basis of this family budget, summarized in part below, we see that the family which in 1913 made a weekly expenditure of \$14.02 for food, heat and light, and rent (shelter) paid for the same quantities of these items during the months of September, October, November, and December, 1918, and January and February 1919, an average of \$21.46, an increase of 53.1 per cent over 1913.

TABLE I.

Cost per week of a family budget of food, fuel and lighting, and rent, in terms of the average prices in sixty cities in Canada.

	1913.	1919.*	Per cent In-crease.
All foods, etc...	7.36	13.58	84.5
Fuel, lighting ..	1.91	3.04	59.1
Rent .. . . .	4.75	4.84	1.9
Total . . . . .	14.02	21.46	53.1

\*Average of Sept., Oct., Nov., Dec., 1918, and Jan. and Feb., 1919.

It is probable that the increase shown by this table is less than the actual increase since the budget on which it is based does not include figures for clothing and sundries. Studies made by the National Industrial Conference Board indicate an increase in living costs in the United States from July, 1914, to March, 1919, of 61 per cent on all items, and it is probable that if the increase could be computed definitely for Canada, it would not be far from this figure.

The figures published in the *Labour Gazette* are at present, however, the only official compilation of retail prices available for Canada, and it is probably best, in order to provide a definite and authoritative basis for readjustment, to use these more conservative figures as the official basis for computation.

### 2. Policy as to Low-Paid Workers.

It has been the general history of violent price fluctuations that wage levels change more slowly, either up or down, than do prices. Statistics are not available to show definitely the extent to which this is the case in Canada today, but we may gain some idea of what this lag of wages behind prices is, from figures published by the United States Department of Labour, which show that the increase in union wages from 1913 to 1918 has been only about 30 per cent, while the increase in food prices has been 68 per cent. It is clear from this statement that even in unionized trades, usually in the most favourable position to secure adjustment of wages, wages have not advanced proportionately with the sharp increase in living costs. A considerable part of the increase in cost, of course, is a direct result of the war, in increased taxes, and rises in prices due to destruction of goods and diversion of productive effort to war purposes. This burden falls to the common lot of all, and with few exceptions it is safe to say that the rank and file of wage-earners and salaried people in the Dominion are to-day suffering a material reduction in incomes,

measured in terms of what these incomes will purchase. It appears on the basis of these facts that civil servants already receiving incomes adequate for comfortable subsistence may reasonably be asked to share with the taxpayer a part of this burden of increased costs resulting from the war, and that payment of bonus should be confined to the lower ranks of the service.

This reduction in the actual purchasing power of incomes has been met by the substitution of cheaper grades or by the cutting off of various items not essential to subsistence. To the man already close to the minimum standard of living, however, such reductions cannot be made save at the direct expense of efficiency and health and of those family and civic responsibilities commonly considered essential to the welfare of the state.

An analysis of departmental pay-rolls for April, 1919, shows that of 34,000 full-time employees approximately 50 per cent are now receiving salaries less than \$1,000 per year, and 27 per cent receive salaries less than \$800 per year. Of these lower-paid employees, many, of course, are young unmarried persons with the prospect of advancement before them. But even with these exceptions it is apparent that there are large numbers in the service who are obliged, under present conditions, to support their families on incomes of less than \$1,000 a year. Under the present living conditions those with families to support cannot maintain an adequate standard of living at these levels, nor can the service expect to hold the interest of competent employees under such conditions. For these wage levels it would appear that the bonus should be adequate to take care of the full increase in the cost of living.

### 3. Minimum Comfort Budget.

In order to determine, as nearly as may be, the amount necessary for the maintenance of a family at a reasonable standard of comfort, a careful comparative study has been made of the results of investigations of domestic budgets of wage-earners. Among the investigations made use of in fixing the amount of this representative budget were the following: Studies of the cost of living made by the Department of Labour of Canada in 1918, studies made by the United States Department of Labour in 1918, 1917, 1902, and other years; studies made by the United States Shipping Board, by the New York Factory Investigation Commission, the New York Bureau of Standards, the Massachusetts and Minnesota Minimum Wage Commission, the Spokane Chamber of Commerce, the National Industrial Conference Board of Boston, Mass., by the Russell Sage Foundation under the direction of R. C. Chapin, and a number of estimates presented by bodies of employees on various occasions. We submit in Table III a summary of the conclusions of this study.

TABLE III.

Minimum comfort budget for family of man, wife, and three children, the typical household of five persons, 1919.	
Necessary annual expenditure for	
Food .. . . .	\$ 635
Clothing .. . . .	271
Fuel and light .. . . .	97
Rent and shelter .. . . .	255
All other .. . . .	300
Total .. . . .	\$1,558

### 4. Basis for Determination of Bonus.

Possible bonus plans may be divided into four general types: (1) The payment of a percentage of the salary based on some recognized index number; (2) payment of a flat amount to those in defined salary and dependency limits; (3) payment of a bonus diminishing with increase of salary, and (4) combinations of these plans, such

as the payment of a flat amount plus a percentage.

Of these plans of payment we believe that the payment of a fixed amount to all Civil Service employees within defined salary and dependency limits, with a diminished amount to those outside these limits, will provide the most effective solution of the conditions outlined in preceding sections of this report.

As a reasonable basis for determination of the amount of this bonus we recommend that the amount of increase in the cost of the comfort budget submitted, over the cost of the same budget in 1913, be taken. If the cost of the budget is to-day 153.1 per cent of its cost in 1913, the amount of this increase would be \$40.27. In other words, \$1,017.63 per year would have maintained the family in 1913 on the same scale as \$1,558 will to-day.

The basis of readjustment of salary rates in the new classification, however, is the price level which would normally have obtained had not war intervened, and this, in the case of the typical income being considered, would have represented a 12 1/2 per cent increase, taking care of \$127.20 of the \$540.27 increase. While this classification is not yet in effect, its provisions, as to salary increase, if adopted, will be retroactive to April 1, 1919, and it seems undesirable to provide for payments that are likely to be subject to revision downward. In the event of failure of adoption of the classification, it may still be said of the amount adopted that it takes care of nearly the full increase in costs of living for the men with small incomes.

There remains to be paid as the bonus necessary to maintain the family on the same scale in 1919 that it maintained in 1913, a balance of \$413.07, or, say, \$420 as the nearest multiple of 12. This sum constitutes a basic bonus, and should be sufficient to enable the man receiving a yearly income of \$1,145 or approximately \$1,200 to maintain his family adequately, while to the man at a lower income it provides a percentage increase greater than the full increase in his costs of living.

### 5. Limits of Application.

A bonus of this amount would not be necessary to enable those on incomes above \$1,200 to maintain this same standard of living. There are several cogent reasons, however, for providing some bonus to those at higher incomes. As a matter of administration it is not desirable to permit a point in the salary scale at which a promotion means no increase, or a negligible increase, in salary. This would be the case if the bonus was stopped short at a definite point. For example, a man receiving just over the limit set would receive considerably less pay than the man just within the limit. It is also true that the budget adopted, while in our opinion adequate for an average family, may be either liberal or inadequate for the individual family, with its own specific problems of locally higher prices, education of children, misfortune, and so forth, and it would be incorrect in theory and unjust in practice to stop sharply at a defined point. Differences in the habits of life of the typical industrial wage-earner and of the average civil servant also exist, and beyond question make it difficult for the man earning \$1,800 to \$2,000 to maintain the standard of living expected of him. All of these considerations point to a relatively gradual reduction of the bonus for incomes above \$1,200.

Some indication of the upper limit for payment is given by the application of formulæ worked out by Professor Wm. F. Ogburn, for the percentages expended at varying incomes for foods, clothes, rent, heat and light, and sundries. The application of these formulæ appears to indicate a relief from pressure at approximately \$2,500. We may safely take \$3,000 as the point of full extinction of the bonus. We suggest therefore the reduction of the amount of the bonus in uniform steps as the income increases to \$3,000.

### 6. Persons Without Dependents.

The basis bonus of \$420 is computed for a normal household of five persons. It is therefore larger than is needed by a person without dependents. We reproduce below the summary of a budget showing the approximate annual expenditures of a single man or woman. This

budget amounts to 58 per cent of the family budget, and indicates a bonus of \$252, or approximately 60 per cent of the basic bonus, for persons without dependents.

TABLE IV.

Estimated minimum Comfort Budget for persons without dependents.

Annual expenditure for	
Food or board .. . . .	\$312 00
Lodgings .. . . .	180 00
Clothing .. . . .	152 00
All other .. . . .	259 00
Total .. . . .	\$903 00

Because of the fact that a considerable part of the household expenses such as rent, fuel and light, and in part food and sundries, do not increase proportionately with the increase of the size of the household and because of the difficulty in administering bonus payments on the basis of the number of persons in the household, it seems advisable not to carry the distinction beyond a division as between the head of a household and the person without dependents.

Where employees receive the prevailing rate for the class of work in the region, it does not appear proper that such persons should also receive the bonus, since they are not subject to the disability placed upon others by the classification, of receiving rates less as a whole than those being paid in commercial employment.

In the case of persons who carry on government work incidentally to other occupations, as in the case of storekeepers or merchants who also act as postmasters in offices of the first or second grade, or preventive customs offices, it does not appear that bonus should be paid, since the duties of such persons are variable and often incidental, and since such persons are not usually primarily dependent on the government for their support. It appears, however, that there are many seasonal employees, working full time for varying periods, and primarily dependent on their government salaries for support. It appears proper that such persons should receive bonus pro rata for the time worked.

## PEAT FUEL HAS LOW ASH CONTENT

### Produces No Soot But More Bulky Than Coal, Report Says.

The following is a summary of the properties of peat fuel when properly manufactured, as given in an address before the Commission of Conservation, ninth annual meeting, by Eugene Haanel, Ph.D., Director, Mines Branch, Department of Mines.

"Peat is a clean fuel to handle; has, as a rule, a very low ash content, and produces no soot or other deposit when burned in an ordinary cookstove or open fireplace. The ash, moreover, is in a very finely divided condition, free from combustible matter and can be easily removed from the stove or fireplace. Clinkers are not formed. On account of the ready manner in which peat fuel ignites, often a little paper or a few shavings are sufficient to start a fire. A peat fire does not, therefore, require to be kept continually burning throughout the day, if not needed, since a new fire can be easily started.

"Peat fuel, on the other hand, is more bulky than coal and is of lower heating value per pound. The relation between anthracite coal and peat fuel as regards heating value per pound is 12,500: 7,000, or 1.8, that is one pound of the average anthracite coal is equivalent in heating value to 1.8 pounds of peat fuel, containing 25 per cent moisture it is necessary to store 1.8 times the weight of the coal required, in peat fuel. The volume occupied by peat fuel is much larger than that of coal. One cubic foot of anthracite weighs approximately 56 pounds, while one cubic foot of machine peat weighs about 27 pounds. The volume of peat required to equal coal of the above heating value will therefore, be about 3.6 to 4 times that of the coal."

Buy Thrift Stamps for children.

# NORTHERN GAME HERDS SUBJECT OF INQUIRY

*New Commission Will Prove Practicability of Utilizing Multitudes of Caribou and Musk Oxen in Economic Plan.*

## VAST GAME RANCH

Under the provisions of Part I of the Inquiries Act, Chapter 114 of the Revised Statutes of Canada, a commission has been appointed recently to investigate the possibilities of the Canadian Northland as a permanent meat and wool producing area. The commission is made up of Dr. J. G. Rutherford, chairman, Ottawa; Messrs. J. S. Maclean, manager Harris Abattoir Company; J. B. Harkin, Commissioner of Dominion Parks; and Vilhjamur Stefansson, the Canadian explorer. The commission, which is authorized to employ, with the approval of the Governor in Council, such assistants as its members may determine, shall receive no compensation except expenses. The commission is expected to report, with the least possible delay, upon the feasibility of the propositions mentioned in the memorandum which follows, together with recommendations in regard to the best methods to follow to bring about efficient development in case it is found that conditions warrant action on the part of the Government, as stated in the July number of the *Agricultural Gazette*.

### THE MEMORANDUM.

"Special attention has recently been directed to the potentialities of the Arctic and sub-Arctic regions of Canada as a grazing country. It is represented that in these regions there is an abundant growth of vegetation in the summer which forms nutritious food for grazing animals in winter as well as summer. It is estimated that there are at least a million square miles of such grazing grounds in northern Canada. The winter climate of these areas is too severe for ordinary domestic cattle, but musk-ox and reindeer can graze there in the open the year round. The dimensions of the reindeer industry in Lapland and in Siberia and the great development of the reindeer herds of Alaska suggest that corresponding development can reasonably be anticipated with respect to northern Canada. In this connection it is pointed out that herds of barren land caribou aggregating, it is estimated, twenty to thirty million animals frequent northern Canada, and that biologically these animals are practically identical with reindeer.

"Vilhjamur Stefansson, the Arctic explorer, is convinced that the musk-ox can be readily domesticated, and has urged that steps be taken in that connection with the object of developing herds for commercial purposes.

"The development of large reindeer and musk-ox herds in northern Canada will represent a very important addition to the meat production of the Dominion. The development of musk-ox herds will represent not only an addition to the meat production, but also to the wool production. The value and attractiveness of reindeer flesh for food purposes is well established. In regard to musk-ox meat, Mr. Stefansson claims it is practically indistinguishable from beef.

"The Arctic and sub-Arctic regions of Canada lie too far north to be included in the lands suitable for the profitable cultivation of cereals, and therefore may be regarded as permanent grazing areas.

"In view of the foregoing, the Minister considers that there are good grounds for believing that the Canadian North may become a great permanent meat and wool producing area and that a commission should be appointed for the purpose of making a thorough investigation into the subject from a business and national standpoint and to report their findings."

# GREATER PRODUCTION ON PRAIRIE INDIAN LANDS

**Energies of Department of Indian Affairs Have Proved Great Success in Securing Increased Live Stock and Grain Production.**

During the past two years the Department of Indian Affairs has been bending its energies to secure increased production of grain and live stock on the Indian reserves in Manitoba, Saskatchewan and Alberta. The work has fallen into three classes, under the direction of Mr. W. M. Graham, and is as follows: Greater production farms; the encouraging of greater production among the individual Indians on the reserves; and the leasing of unused land for farming and grazing purposes.

First, as to the greater production farms on the Indian reserves.

On February 16, 1918, Mr. Graham was by Order in Council made Commissioner of Lands for Manitoba, Saskatchewan and Alberta and was entrusted with the work of speeding up the production of grain and cattle. For this work an appropriation of \$300,000 was made. Complete equipments of all kinds necessary for the work were provided and as a result, 20,448 acres of land were broken on the reserves and made ready for this year's crop. The average cost of breaking was \$5.60 an acre. Of this area 18,000 acres have been sown to wheat and the other 2,000 acres to oats.

The following tables show the total acreage cultivated on the Government Greater Production Farms and the cost of operating.

Alberta.		
Agency.	Acreage.	Operating Expenses.
Blackfoot . . . . .	7,568	\$45,018 06
Blood . . . . .	4,880	25,538 71
<b>Total . . . . .</b>		<b>\$70,556 77</b>
Saskatchewan.		
Qu'Appelle (Muscowpetung) . . . . .	3,500	\$22,831 86
Crooked Lake . . . . .	3,500	13,056 27
Assiniboine . . . . .	1,000	9,037 56
<b>Total . . . . .</b>		<b>\$44,925 69</b>

The results obtained from the effort to speed up production on the part of the Indians themselves have been very gratifying. These are set forth in the following recapitulation shown by provinces, the total increase in the acreage cropped, acreage broken and summer-fallowed by individual Indians:—

Alberta.		
Acreage cropped by Indians: 1917, 14,792; 1918, 18,285.		
Acreage broken: 1917, 1,525; 1918, 6,673.		
Acreage summer-fallowed: 1917, 4,621; 1918, 3,608.		
Increase crop acreage 1918 over 1917, 3,491.		
Acreage increase, cultivation, 1918, 7,628.		
Saskatchewan.		
Acreage cropped by Indians: 1917, 19,191; 1918, 23,774.		
Acreage broken: 1917, 2,732; 1918, 7,154.		
Acreage summer-fallowed: 1917, 6,100; 1918, 5,584.		
Increase crop acreage 1918 over 1917, 4,585.		
Acreage increase, cultivation, 1918, 8,489.		
Manitoba.		
Acreage cropped by Indians: 1917, 6,302; 1918, 8,114.		
Acreage broken: 1917, 436; 1918, 1,148.		
Acreage summer-fallowed: 1917, 1,686; 1918, 2,316.		

Increase crop acreage 1918 over 1917, 1,812.
Acreage increase, cultivation, 1918, 3,154.
<b>Grand Total.</b>
Acreage cropped by Indians: 1917, 40,285; 1918, 50,173.
Acreage broken: 1917, 4,693; 1918, 14,975.
Acreage summer-fallowed: 1917, 12,407; 1918, 11,508.
Increase crop acreage 1918 over 1917, 9,888.
Acreage increase, cultivation, 1918, 19,271.

The following statement shows the percentages of increase in the areas utilized on Indian reserves for cultivation and stock-raising as a result of the Greater Production campaign:—

Total acreage cropped by Indians: 1918, 50,173 acres; 1917, 40,285 acres. Increase, 9,888 acres or 24½ per cent.
Total acreage cultivated by Indians: 1918, 76,656 acres; 1917, 57,385 acres. Increase, 19,271 acres, or 33½ per cent.
Total acreage estimated to be cropped by Indians in: 1919, 66,483 acres; 1918, 50,173 acres. Increase, 16,310 acres, or 32½ per cent.
Total acreage estimated to be cropped by Indians in: 1919, 66,483 acres; 1917, 40,285 acres. Increase, 26,198 acres, or 65 per cent.

The third method by which greater production was secured was through obtaining the consent of the Indians to utilize unused land on the reserves and leasing it for grazing and farming purposes. The Indians are paid for these surrenders and the lands so surrendered are leased under specified conditions. The surrenders are only taken temporarily during the period of the greater production activities.

Cultivation by individual Indians, by Lessees and on Greater Production Farms:—

Total acreage estimated to be sown in 1919 is as follows:—
Acreage, fall and spring sowing, by Indians, 40,000 acres; broken by Indians, 1918, 14,975 acres; summer-fallowed by Indians, 1918, 11,508 acres; broken by leases, 1918, 10,416 acres; broken on Greater Production Farms, 20,712 acres; total 97,611 acres. Total acreage cropped by Indians, 1918, 50,173 acres.
Increase, 47,438 acres over 1918, or 94½ per cent.
Increase, 57,326 acres over 1917, or 142½ per cent.

Estimated acreage of open land in reserves Alberta, Manitoba and Saskatchewan, 1,933,138 acres.

Acreage utilized previous to 1918:—  
For Indian cattle, estimated, 225,840 acres; for Indian horses, estimated, 115,000 acres; Indian crops, 1917, 40,285 acres; Indian breaking, 1917, 4,697 acres; Indian summer-fallow, 12,407 acres; total, 398,225 acres, or 20 per cent. Leaving 1,534,913 acres.

Acreage utilized 1918:—  
For Indian cattle, estimated, 225,840 acres; for Indian horses, estimated, 115,000 acres; Indian crops, 1918, 50,173 acres; Indian breaking, 1918, 14,975 acres; Indian summer-fallow, 1918, 11,508 acres; leased for grazing, 226,980 acres; leased for farming, 17,493 acres; breaking on Greater Production Farms, 20,712 acres; total 682,581 acres or 35½ per cent. Leaving 1,250,457 acres.

Percentage of increase, land utilized in 1918 over 1917, 71½ per cent.  
The following figures show what has been done in promoting the raising of live stock among the Indians:—

Cattle.	
No. Steers sold.	Value Received.
Alberta, 243 . . . . .	\$39,094 72
Saskatchewan, 590 . . . . .	71,673 42
No. Cows.	Value Received.
Alberta, 99 . . . . .	\$ 9,897 30
Saskatchewan, 153 . . . . .	11,304 75
No. Animals Beefed.	Value.
Alberta, 350 . . . . .	\$21,984 70
Saskatchewan, — . . . . .	No record.

# RULES FOR EFFICIENT FURNACE MANAGEMENT

**Suggestions Drawn up by Fuel Testing Division**

The Fuel and Fuel-Testing Division, Mines Branch, Department of Mines, has issued the following suggestions for the guidance of householders in the proper operation of house-heating apparatus:—

1. Do not overheat your house.
2. Prevent air entering through cracks by means of weather stripping or other device. Use storm doors and double windows and do not open them unnecessarily.
3. Use as few rooms as possible; seal up and cut off the heat from those not in use.
4. Cover up hot water radiators, or shut off hot air supply to bedrooms at night when the windows are open.
5. Keep the furnace working as evenly as possible; do not let the fire burn too low and then burn coal rapidly to warm the house again.
6. Regulate the air supply over the fire to suit the air supply through the fire, except just after charging fresh coal, when a larger supply must be provided to burn the coal gas.
7. Control the rate of combustion in the furnace by the turn damper in the flue pipe as much as possible. Care must be taken, however, in using this damper to see that it does not unduly cut off the draft which would cause the gases, some of which are poisonous, to pass up into the house.
8. Use those dampers as sparingly as possible which operate by admitting air into the flue or above the fire. It will, however, be dangerous to substitute the turn damper for the air damper where the flue passes close to unprotected wood or other combustible material.
9. When it is impossible to reduce the rate of combustion in the furnace by the damper use smaller coal, or cover the top of the fire bed with small size coal.
10. Prevent air from leaking into the gas passages of the furnace.
11. Remember that any device introduced into the space above the fire bed of the furnace for evaporating water for humidifying the air, or for heating water for general purposes, uses heat which would otherwise be used for heating the house. Use water heated by this means, therefore, as sparingly as possible.
12. Keep the gas passages in the furnace clean.
13. Where a hot air furnace is installed, take no air into the system from outside.
14. When the basement is warmer than is necessary, cover the furnace and pipes with asbestos, magnesia, or other insulating material.

## Circulation of Labour Gazette.

During the fiscal year 1917-18 the average monthly circulation of the *Labour Gazette*, published by the Department of Labour, was 11,951 copies, as stated in the report of the Department of Labour.

### Greater Production.

File Hills—Number steers sold, 329; average price, \$112.38; value received, \$39,975.85; number of cows, 47; average price, \$90.67; value received, \$4,261.60.

Total animals sold from Agencies, 1,085. Value received \$131,970.19.

Total animals beefed in Alberta where sales not held, 350. Value received, \$21,984.70.

Total animals, 1,435; total value, \$153,954.89.

Greater Production, animals 376; value received, \$44,236.95.

Grand total: animals, 1,811; value, \$198,191.84.

**War Savings Stamps not only save money but earn it.**

## METHODS BY WHICH FUR STATISTICS COULD BE OFFICIALLY COMPILED

*Dominion Statistician Shows How Details of Fur Trade May be Included in Annual Census of Production.*

### IMPORTANCE OF TRADE

Before the National Conference on Conservation of Game Fur-bearing Animals and other Wild Life, held in Ottawa this year under the direction of the Commission of Conservation, in co-operation with the Advisory Board on Wild Life Protection, Mr. R. H. Coats, Dominion Statistician and Chief of the Dominion Bureau of Statistics, gave an address on the subject of "Fur Statistics," in which he indicated methods whereby statistics of fur resources might be secured. Mr. Coats' address, which is to be published by the Commission of Conservation in its forthcoming report of the conference, is reproduced below, in part, as follows:—

"I am grateful for this opportunity of saying a few words to your conference on the subject of Statistics, because I hope you may be able to help us in a difficulty that confronts us at the Bureau of Statistics. The difficulty is in connection with fur statistics. We have organized, during the last eighteen months, a census of production for Canada, which we call the Census of Industries. It is to be on an annual basis, and is to be as comprehensive as we can make it, including agriculture, fisheries, forestry, mining, and the various branches of manufacture. It has been a rather large undertaking to organize, because we hoped to work in close co-operation with the various Governments, Dominion and Provincial, which have regulative functions in different sections of the field. For example, in dairy statistics. Until the last two or three years, we had no less than eleven departments collecting statistics, the Bureau of Statistics, the Dominion Dairy Branch, and the nine provincial dairy branches. We could not collate the statistics of the several branches, because they were all compiled by different methods and covered different aspects. To-day we are doing this work as follows: First, we have united upon a form. The Bureau of Statistics prints it; a sufficient number are then sent to each provincial department, which collects the data through its field officers, who are, of course, excellently qualified for that function. The resulting schedules are sent to my office for compilation, for we have about \$100,000 worth of machinery and a large compiling staff, which can handle such work expeditiously. We immediately sent back the result to the provinces for use in any way they may wish. We publish a report for the whole of Canada; it is edited by the Dairy Branch, though finally sent out by the Bureau.

"Raw furs are the chief commercial product of the wild life of Canada, and as such represent the only economic return from hundreds of thousands of square miles, constituting perhaps half the area of the Dominion.

"The existing Canadian statistics of raw furs are in five areas, namely: (1) those of the decennial census; (2) those shown in certain sections of the annual industrial census; (3) those of the Indian Department; (4) exports and imports; and (5) those of certain provincial departments.

"(1) *The Decennial Census.*—This return shows the number and value of the different kinds of furs taken in the several provinces during the year pre-

INLAND REVENUE		
ACCRUED DURING		
MONTH OF JUNE		
The Inland Revenue Department issues the following Unrevised Statement of Inland Revenue accrued during the Month of June, 1919.		
Source of Revenue.	Amounts.	Total.
	\$ cts.	\$ cts.
Excise.		
Spirits.....	419,143 35	
Malt liquor.....	2,696 00	
Malt.....	190,044 12	
Tobacco.....	2,425,650 88	
Cigars.....	99,771 26	
Manufactures in bond.....	10,512 90	
Acetic acid.....	395 58	
Seizures.....	13,136 63	
Other receipts.....	2,771 46	
Total Excise Revenue.....		3,164,122 18
Methylated spirits.....		39,476 69
Ferry.....		
Inspections of weights and measures.....		
Gas inspection.....		
Electric light inspection.....		
Law stamps.....		891 30
Other revenues.....		3,573 03
War Tax.....		1,378,025 42
Grand Total Revenue.....		4,586,088 62
The total amount of revenue collected during June, 1918, was.....		2,993,630 95

ceding the census. The statistics are obtained as follows: In the settled districts a return is obtained by the census enumerator from every farmer, showing the number, kind, and value of forest animals taken on the farm. For the unorganized districts a return is obtained from the several fur-trading companies, showing the number, kind, and value of raw furs (also fish) purchased from individual Indians; at the same time, the number and kinds of furs captured by individual Indians living on reserves are obtained through the Indian Department, these being checked against the fur-traders' returns to prevent duplication. The total capture in 1910 showed a value of approximately \$2,000,000, divided among forty-one kinds of furs, and representing about 1,200,000 animals. The rise in prices would perhaps double the above values to-day.

"The most obvious defect of this inquiry is its infrequency, which renders the results of secondary value as a commercial guide, and also limits their usefulness in the study of problems connected with the increase or decrease of wild life.

"(2) *The Industrial Census.*—Two of the 450 sections of the annual industrial census throw light on the output of raw furs, namely, the sections on fur-dressing establishments, and (2) establishments for the manufacture of hats, caps, and fur goods. Each establishment is required to answer upward of 100 questions on various details. One of these groups of questions is 'Materials used'; a second is 'Products'. The chief raw material of fur-dressing establishments is raw furs and the product is dressed furs. Similarly, for hat, cap, and fur manufacturing establishments, the items 'Furs and skins, raw,' and 'Furs and skins, dressed,' occur under the heading 'Material used,' whilst under the general heading of 'Products,' men's fur and fur-lined coats, ladies' fur and fur-lined coats, fur caps, fur hats, muffs, stoles and other neckwear, fur or fur-lined gloves or gauntlets are included. There is also an item requiring a return of receipts for custom work on the remodelling and the repairing of furs.

"The statistics for 1917 show that an insignificant quantity of raw furs was consumed in the twelve establishments

engaged in the dyeing and dressing of furs in Canada, most of these concerns doing custom work only, though the dressed product was valued at over \$1,000,000. In hat, cap, and fur establishments (numbering 253) \$2,596,332 worth of raw furs and \$2,482,027 worth of dressed furs were used, the product of fur goods being valued at \$9,767,872.

"The above record of furs consumed in manufactures, of course, does not show the different kinds of furs or the number of fur-skins. As it includes, also, a considerable quantity of imported furs, it throws little or no light in itself on the total value of the native raw fur product from year to year.

"(3) *Indian Department Statistics.*—The Indian Department maintains a record of the amounts earned by Indians on reserves in hunting and trapping. In 1917 this was over \$900,000. This, however, does not include the product of the 'Treaty No. 8' Indians or represents only about 20 or 25 per cent of the product of all Indians.

"(4) *Exports and Imports.*—The Canadian import classification shows the following items under the heading of furs:—

	Calendar year 1917.
1. Astrachan or Russian hare skins and China goat skins, plates, rugs, wholly or partially dressed but not dyed..	\$ 118,666
2. Fur skins, undressed, the produce of marine animals .....	2,928
3. Fur tails in the raw state .....	144
4. Fur skins of all kinds, not dressed in any manner.....	2,810,171
5. Fur skins wholly or partially dressed .....	638,853
6. Hats, caps, muffs, tip-pets, capes, coats and cloaks of fur and other manufactures of fur ..	475,479
The export classification has four items:—	
1. Furs dressed..	\$ 97,627
2. Furs undressed ..	6,721,141
3. Furs or skins, the produce of fish or marine animals .....	46,353
4. Fur, manufactures of ..	33,635

"No quantities are recorded of either imports or exports, and, as will have been seen, only limited distinction is made between the different kinds of furs.

"Ordinarily, if one knows the imports and exports of an article and also the consumption in manufactures, one can deduce domestic production by adding exports and consumption and subtracting imports. In 1917, if one adds the exports and home consumption of raw furs, and deducts imports, one obtains a result of about \$6,500,000 as the value of the production of raw furs in Canada. There are elements of vagueness in this that render it an unsatisfactory statistic; as a reflection of the product of wild life it would require discounting by the value of the product of our fur farms, which, in some years, runs between \$2,000,000 and \$3,000,000. This would bring it somewhere in the neighbourhood of the 1911 census returns reckoned at present prices.

"(5) *Provincial Statistics.*—Certain of the provinces publish statistics, but methods differ and it is impossible to collate a Dominion total. Those of Nova Scotia and Quebec seem to be the best as specific statements of furs taken from year to year.

### THE REMEDY.

"The remedy lies in instituting a direct annual record of fur skins taken. This could probably be best achieved by Dominion and provincial co-operation, according to some such plan as the following:—

"It is understood that raw furs are dealt in under license of the provincial authorities. If the provincial authorities would supply annually to the Dominion Bureau of Statistics a list of the names and addresses of those to whom licenses have been issued for the purchase of raw furs within their respective province, the Bureau would undertake to circularize each licensee and obtain from him full details of furs purchased. The large trading companies, who operate outside of provincial boundaries, would, of course, be included, such as the Hudson's Bay Company, Revillon Freres, the Northern Trading Company, Edmonton; the Bryan Company, Edmonton; W. Gordon, Fort McMurray; and Colin Fraser, Fort Chipewyan. Confirmatory information might be obtained from the boards of trade at Edmonton and Vancouver. The Indian Department figures could be collated, and so also could the figures derived from the enforcement of royalties by provincial departments. The operations of fur farms could be obtained as a separate inquiry, necessary if we are to thoroughly distinguish the products of our wild life.

"This would not enable an exact return by provinces to be given, as there may be instances of skins being purchased by dealers from individuals in another province, but it would be approximately correct provided care were taken to eliminate resales and all other trading between dealers. The export and import figures and the statistics of the consumption of raw furs in fur-dressing and fur-manufacturing establishments would be useful as a check.

## WHAT TILLAGE WILL DO FOR ORCHARD

The success of an orchard project in British Columbia demands that thorough tillage be practised until such time as the trees are well established. Surface tillage conserves the moisture of the winter and spring months for the use of the trees during the period of growth and seasonal fruit development. An Experimental Farms bulletin states that tillage aerates the soil aiding chemical and bacterial action in plant food production. The tillage operations aid in the disintegration of the soil particles that carry the food elements. Tillage destroys many insect pests and fungus spores, thereby reducing greatly the insect and fungus injury.

In the arid sections, tillage destroys the soil fibre and reduces the vegetable matter or humus-making agent. With the fibre or vegetable matter gone, the soils become more difficult to till and poorer in nitrogen.

Tillage practice has a big balance in its favour and is the practice of the most successful orchardists.

War Savings Stamps not only save money but earn it.

Buy War Savings Stamps.

## COMPARISON BETWEEN HEATING BY FUELS AND ELECTRICALLY

*Bulletin Shows Electricity impracticable for House Heating Owing to Cost and Power Required.*

### PRACTICAL VIEW

The heating of houses by the use of fuel and by electricity is the subject of a bulletin prepared by A. S. L. Barnes, assistant engineer of the staff of the Hydro-Electric Power Commission of Ontario, and issued by the Honorary Advisory Council for Scientific and Industrial Research. The writer of the bulletin shows that electrical heating of houses is not practicable in existing conditions, as the following extracts indicate:—

"The fuel problem to-day is so serious that technical men all over the country are looking at it from every aspect; the more efficient use of coal in furnaces, the manufacture of gas from coal, peat, etc., the briquetting of lignite coal and peat, and the possibilities of electric heating have all been receiving careful attention for some time.

"Unfortunately, some engineers and a few other persons, who ought to know better, have been giving out hints that sooner or later electricity would come to the rescue and solve the heating problem completely. Unquestionably, in some of the more temperate regions of the world such comparatively small amount of heating as is required may be supplied through the medium of electricity, but the situation in Canada is altogether different.

"The climate of the greater part of this country is so severe in the winter that even the immense potentialities of its water-powers, if fully developed, would be altogether inadequate to cope with the demand for power for electric heating if this were fostered to any considerable extent.

"An attempt is here made to eradicate, if possible, from the popular mind this idea that electricity is destined to take the place of coal or other fuels for the heating of houses, offices, etc., on an extensive scale; and, at the same time, to indicate in what manner electric energy may be most usefully and economically applied for heating purposes.

### ADVANTAGES OF ELECTRIC HEATING.

"Undoubtedly electric heating approaches more nearly to the ideal than that obtained by any other means. Electric heaters can be designed for operating at any desired temperature, i.e., they may be arranged to work at a high temperature and give off radiant heat like a fire, or they may be designed for operation at a low temperature like a hot-water or steam radiator, and give up their heat by convection; that is, the heat is convected (or conveyed), by setting the particles of air in motion, to various parts of a room. There is no dust, smoke, smell, or noxious gas from an electric heater, no soot, ashes, or dirt of any kind, and it does not vitiate the atmosphere by using up the oxygen; the heating can be under complete and ready control by the turning of a switch, thus decreasing or increasing the number of heating elements in service or shutting off the current entirely; automatic control by means of thermostats is, of course, possible. Electric heaters can be obtained in portable form, and there is less risk of fire from electric heating than from any other method.

### COST WOULD PROHIBIT.

"The difficulties in the way of electrical house heating on a general scale are shown by a comparison of costs of coal and electricity, and by figures showing the power which would be required for general electrical heating.

"Power at an average rate of 10.5 horse-power would be required through-

out the entire season. Electricity is sold by the kilowatt hour, and a kilowatt equals 1.34 horse-power, therefore if the price per kilowatt hour be, say, 1 per cent, the price per horse-power hour would be practically 0.75 per cent, so that the season's bill on this basis, if electricity were used, would be 53,920 by 0.75, which equals \$3.97, the net amount would be 10 per cent less, viz., \$3.57. People would not care to pay so large a bill for heating an 8-roomed house for a single season. The power required would be another difficulty. For example, there are about 80,000 homes in the city of Toronto; if each of these is to be heated and a demand of, say, only 12 horse-power per home must be met (probably a very conservative figure as an average for large and small homes) no less than 960,000 horse-power must be supplied for homes alone—no factories, no offices, no works, no street cars, no houses, even, will get any lighting or power from this, it is all required on the coldest days for heating homes alone, and more will be needed in proportion as the population increases. The great Chippewa scheme at Niagara Falls only contemplates developing 300,000 horse-power for the present, and the total generated at Niagara 780,000 horse-power, and the entire maximum demand for all Toronto at present, including all power, lighting, and traction purposes is only in the neighbourhood of 125,000 horse-power.

"It may be added that the 6,000,000 horse-power, which represents the estimated total possible development of Ontario water-powers, is not sufficient to supply merely the existing homes of Ontario with electric energy for heating alone, exclusive of all other domestic, commercial and industrial requirements."

## GROSS EARNINGS OF ELECTRIC RAILWAYS

The following table shows the gross earnings of the electric railways of Canada from 1901 to 1918, as published in the annual report of the Department of Railways and Canals:

Year.	Gross earnings.
1901 . . . . .	\$ 5,768,233
1902 . . . . .	6,486,438
1903 . . . . .	7,233,677
1904 . . . . .	8,453,609
1905 . . . . .	9,357,125
1906 . . . . .	10,966,871
1907 . . . . .	12,630,430
1908 . . . . .	14,007,049
1909 . . . . .	14,611,484
1910 . . . . .	17,100,789
1911 . . . . .	20,356,952
1912 . . . . .	23,499,250
1913 . . . . .	28,216,111
1914 . . . . .	29,691,007
1915 . . . . .	26,922,900
1916 . . . . .	27,416,285
1917 . . . . .	30,237,664
1918 . . . . .	24,299,890

The operating expenses of these railways in 1918 were \$17,535,974.63, and the rate of operating expenses to gross earnings was 72.17.

Owing to the non-availability of statistics of the Montreal Tramways and two other units, they are not included in the above.

## CONTRACTS AWARDED BY ORDER IN COUNCIL

The Department of Public Works, Ottawa, has awarded the following contracts under Order in Council:—

St. John, N.B.—Alterations and additions to Post Office fittings. Contractors: John Flood & Sons, of St. John, at \$1,950. Order in Council dated July 15, 1919.

Midland, Ont.—Renewals to Governments wharfs Nos. 1 and 2. Contractor: Wm. Henry McArdle, of Midland, at \$3,291.30 (unit prices). Order in Council dated July 15, 1919.

Portage du Fort and Bryson, Que.—Painting of bridges. Contractors: Canadian Sand Blast Company, Limited, of Montreal, at \$4,950. Order in Council dated July 15, 1919.

Halifax, N.S.—Alterations and additions to fittings in Post Office. Contractors: Thomson & Theakston, of Halifax, at \$9,790. Order in Council dated July 22, 1919.

## INCREASING TENDENCY TO MARKET OWN LIVE STOCK CO-OPERATIVELY

*Rapid Growth of Movement Among Farmers of Dominion to Market Their Live Stock Themselves.*

### STRONG IN WEST

"More than seven thousand cars of live stock were marketed co-operatively by the farmers of five provinces in Canada last year, and this system is only commencing. This augurs well for the live stock industry, which is entering upon a period of unprecedented development. The world is very short of its live stock needs. Canada, according to official statistics, has only six head of cattle to the hundred acres of land used for farming purposes, whereas the United States and Australia have eight, Italy ten, France twelve, Great Britain and Germany sixteen, Denmark twenty-five, and Holland twenty-nine head. Canada's position in the ranks of hogs and sheep is also very low as compared with many other countries. The hope of continued prosperity in Canada depends on the success of the farming industry, and it is recognized that live stock is at the very base of agricultural welfare," it is stated in a leading article in the July issue of the *Agricultural Gazette of Canada*, edited by Mr. J. B. Spencer, B.S.A., and published monthly by the Department of Agriculture.

### MOVEMENT GREATER IN WEST.

"The co-operative marketing of live stock has made greatest progress in the Prairie Provinces," the article continues. "Dotted over the country from Winnipeg to the Rockies, local live stock shipping associations are in operation. Many of these are associated with the grain growers' movement, but in Saskatchewan more especially stock marketing associations incorporated under the Agricultural Associations Act are doing business on an extensive scale. In Ontario from two hundred to two hundred and fifty organizations are shipping. Many of these organizations had their origin in farmers' clubs, while others began under the auspices of the United Farmers' Association. In Quebec the Cheesemakers' Agricultural Co-operative Association markets all classes of commercial live stock, while the live stock associations handle breeding stock. In the provinces farther east co-operative marketing has been applied more especially to sheep and lambs. It is fair to assume that at a comparatively early date much of the live stock in Canada will be marketed by the farmers themselves, who through the system will become familiar with the methods and principles of marketing and will thus be encouraged to so improve and finish their animals as to reap the full value of their efforts."

## GEODESY DEFINED IN SURVEY PUBLICATION

### Science of Surveying Extended to Large Tracts of Country

"Geodesy is the science of surveying extended to large tracts of country, having in view not only the production of a system of maps of very great accuracy, but the determination of the curvature of the surface of the earth and eventually of the figure and dimensions of the earth. This last, indeed, may be the sole object in view, as was the case in the operations conducted in Peru and in Lapland by the celebrated French astronomer, P. Bouguer, C. M. De La Candamine, A. C. Clairault and others, and the measurement of the meridian arc of France by Michain and Dalambre had for its determination the true length of the 'Metre' which was to

be the legal standard length of France. "The basis of every extensive survey is an accurate triangulation, and the operation of geodesy consists in the measurement, by theodolites, of the angles of the triangles, the measurement of one or more sides of these triangles on the ground, the determination by astronomical observations of the azimuth of the whole network of triangles; the determination of the actual positions of the same on the surface of the earth by observations, first for latitude at some of the stations, and secondly for longitude and the determination of altitude for all the stations. The azimuth and longitude must always be observed at the same station, thus providing a Laplace determination to control the twist of the triangulation. For computation the points of the actual surface of the earth are imagined as projected along their respective plumb lines on the mathematical figure which is given by the stationary sea level and the extension of the sea through the continents by a system of imaginary canals.

"For many purposes the mathematical surface is assumed to be a plane; in other cases a sphere of radius 6,371 kilometres (20,900,000 feet); in case of extensive operations the surface must be considered as a compressed ellipsoid of rotation, whose minor axis coincides with the earth's axis and whose compression, flattening or ellipticity is about 1/298."

The above is taken from a bulletin entitled "Standards of the Geodetic Survey of Canada," by Mr. F. A. McDiarmid, and issued by the Geodetic Survey, Department of the Interior.

### Regina Tender.

Sealed tenders addressed to the undersigned, and endorsed "Tender for Paving Lane Adjoining P.O. Building, Regina, Sask.," will be received until 12 o'clock noon, Monday, August 18, 1919, for paving lane adjoining Post Office Building, Regina, Sask.

Plans and specification can be seen and forms of tender obtained at the offices of the Chief Architect, Department of Public Works, Ottawa; the Clerk of Works, Regina, Sask.; and the Resident Architect, 802 Lindsay Building, Winnipeg, Man.

Tenders will not be considered unless made on forms supplied by the Department and in accordance with the conditions contained therein.

Each tender must be accompanied by an accepted cheque on a chartered bank payable to the order of the Minister of Public Works, equal to 10 p.c. of the amount of the tender. War Loan Bonds of the Dominion will also be accepted as security, or War Bonds and cheque if required to make up an odd amount.

By order,

R. C. DESROCHERS,  
Secretary.

Ottawa, July 25, 1919.  
Department of Public Works,

### Expenditure on Canals.

The total expenditure on the Dominion canals for the twelve months ended March 31, 1918, was \$3,327,556.55, comprising \$1,781,957 charged to capital, \$111,552.28 charged to income, \$859,119.25 for staff, and \$574,927.95 for repairs, the last two items being charged to revenue, as stated in the annual report of the Department of Railways and Canals.

### Employed on Railroads.

In 1918, 143,493 persons were employed on Canadian railways, and the wages and salaries paid to them amounted to a total of \$152,274,953, according to the annual report of the Department of Railways and Canals.

### Cost of Railway Fuel.

In 1913 the average cost of the fuel consumed by Canadian railways was \$3.07 per ton, and in 1918 it was \$5.17 per ton, according to statistics compiled by the Department of Railways and Canals.

War Savings Stamps pay 4½% compounded half-yearly.

### Canadian Official Record.

Published Weekly by the Director of Public Information.

Offices: Hope Chambers, Sparks St., Ottawa.

Tel. Queen 4055 and Queen 7711.



Copies of the CANADIAN OFFICIAL RECORD will be mailed free of charge to members of Parliament, members of the Provincial Legislatures, members of the Judiciary, daily and weekly newspapers, army officers, mayors and postmasters of cities and towns, and to all public officials and institutions who are in a position to disseminate official news.

#### Subscription Rates.

One year . . . . . \$2.00  
Six months . . . . . 1.00

Cheques, money orders and drafts should be made payable to the CANADIAN OFFICIAL RECORD.

#### EXTRACT FROM ORDER IN COUNCIL No. 2206.

"The Committee of the Privy Council further observes that as this war is being waged by the whole people of Canada, it is desirable that the whole people should be kept as fully informed as possible as to the acts of the Government which are concerned with the conduct of the war, as well as with the solution of our domestic problems; and for this purpose an Official Record should be instituted to be issued weekly for the purpose of conveying information as to all Government measures in connection with the war and as to the national war activities generally."

### PULP MANUFACTURE FROM WOOD WASTE

The manufacture of pulp and paper from wood is an industry which has proved itself stable and of increasing magnitude for a number of years. Almost every kind of wood has been proved suitable for the manufacture of some form of paper, but there are considerations affecting the use of each kind which must always be observed. Most of the pulp is made from the wood cut especially for the purpose, but almost any wood can be used, provided that it is reasonably free from dirt, knots, and bark, or that these can be easily removed from it. Sawdust is an exception to this rule on account that the fibres are cut so short that the pulp produced will not felt properly and the cooking is made considerably more difficult. There are several mills in the United States at present using mill-slabs, shavings, and other forms of waste more or less entirely. The advantages of waste wood are, of course, its cheapness and its quantity. There are several disadvantages; it is usually green and full of water, has a large percentage of bark, and comes in irregular shape. Shavings are rather better for the purpose, and if in sufficient quantity make very good raw material. Another point to be taken care of in using waste material such as this is to use the raw material of only one species, or at least species sufficiently alike that they may respond to the same treatment. For instance, on account of the relatively large content of resin in longleaf pine, it would not do to treat this in the same way as spruce. Neither will it be satisfactory to work hard and soft woods together in any one treatment, though any of these can be worked satisfactorily if kept separate. The process to be used will depend chiefly on the raw material at hand, and on the market for any particular variety of pulp, as stated in a circular entitled "Chemical Methods of Utilizing Wood Wastes," by W. B. Campbell, B.Sc., issued by the Forestry Branch, Department of the Interior.

#### Automobile Insurance.

During the year 1918 automobile insurance claims amounting to \$383,917 were paid by the companies insuring automobiles in Canada, as shown in the report of the Superintendent of Insurance, Department of Finance.

#### Are you buying W.S. Stamps?

## POSITIONS UNDER AIR BOARD ARE ADVERTISED

### Superintendent of Flying Operations, Secretary and Medical Officer are Asked For--Other Positions Open in Civil Service.

The Civil Service Commission of Canada gives notice that applications will be received from persons qualified to fill the following positions under the Air Board, the tenure of office to be for three years, renewable:—

*A Superintendent of Flying Operations; Salary \$4,500 and up.*

1. A Superintendent of Flying Operations under the Air Board, at an initial salary of \$4,500 per annum; to have charge, under executive direction, of the Flying Operations Branch of the Air Board; to organize and direct such flying operations as may be undertaken by the Government of Canada; to have charge of Government supply depots; to advise as to the proper types of machines for various kinds of Government duty; to be responsible for the purchase and storage of Government machines and equipment; to supervise their proper up-keep and repair; and to perform other related work as required.

Candidates should have education equivalent to university graduation; at least two years of flying experience in a British Air Force; wide experience of flying various types of flying machines; knowledge of numerous types of flying machines and of the theory of flying; ability to select the proper type of machine for given operations; and to organize and administer flying undertakings. Candidates must be able and willing to fly.

*A Superintendent of Certificate Branch; \$3,600 and up.*

2. A Superintendent of Certificate Branch for the Air Board, at an initial salary of \$3,600 per annum, to have charge, under executive direction, of the Certificate Branch; to approve air routes and aerodromes; to supervise the examination and to approve of flying machines for airworthiness; to supervise the examination of and the issue of certificates and licenses to pilots, navigators and mechanics; and to perform other related work as required.

Candidates should have education equivalent to university graduation; at least two years of flying experience in a British Air Force, with wide experience in flying all types of flying machines; thorough knowledge of the theory of flight, the design of flying machines, and principles and practice of aerial navigation, the materials entering into the construction of aeroplanes and engines, and the rigging and overhauling of all types of machines; administrative and organizing ability. Candidates must be able and willing to fly.

*Secretary, Air Board; Salary \$3,000-\$3,720.*

3. A Secretary, Air Board, at an initial salary of \$3,000 per annum, to have charge, under executive direction, of the Secretary's Branch of the Air Board; to handle correspondence, compile and direct the publication of reports, and generally administer the routine work of the Air Board; to keep records and minutes of proceedings; to keep in touch with aeronautical improvements, achievements, and literature; to supervise and direct the acquisition of aeronautical information and its distribution to the members of the Air Board and to other officers; and to perform other related work as required.

Candidates should have education equivalent to graduation from a university of recognized standing; at least two years of office experience, one year of which should have been in connection with aeronautics; a thorough knowledge of the various types of aircraft, and accessories; and administrative and organizing ability. Candidates must be willing to take the air.

*Medical Officer, Air Board; Salary \$2,400 per annum.*

4. A Medical Officer for the Air Board, at an initial salary of \$2,400 per annum, to undertake the direction of the Superintendent of the Certificate Branch, the medical examination of candidates for and holders of pilots' and navigators' certificates; and to do other related work as required.

Candidates should have been graduated from a medical school of recognized standing with a Provincial or Dominion license to practice medicine and have had medical experience with an Air Force Squadron. Candidates must be willing to take the air.

#### General Directions.

Selections for eligible lists of applicants qualified to fill similar vacancies which may occur in future may be made from applications for these positions. Future vacancies will probably include an Assistant Secretary; in the Certificates Branch, two Inspectors, one for Pilots and Navigators and one for Aeroplanes and Mechanics; and in the Operations Branch, a Flying Officer, and an Equipment and Supply Officer.

According to law, preference is given to returned soldier applicants, possessing the minimum qualifications. Returned soldiers must furnish a certified copy of their discharge certificates, or in the case of commissioned officers, a certified statement of their military services.

Application forms must be filed in the office of the Civil Service Commission not later than the 21st of August, 1919. Such forms may be obtained from the Secretary of the Civil Service Commission, Ottawa, the Vice-Chairman of the Air Board, Ottawa, or the Dominion-Provincial Employment Offices.

By order of the Commission,  
W. FORAN,  
Secretary.

Ottawa, July 24, 1919.

The Civil Service Commission of Canada give notice that applications will be received from persons qualified to fill the following positions in the Civil Service of Canada:—

*A Trade Commissioner for Havana, Department of Trade and Commerce; Salary \$3,000 per annum with \$500 Living Allowance.*

I. A Trade Commissioner for Havana, Department of Trade and Commerce, at a salary of \$3,000 per annum with \$500 living allowance. Preference will be given to candidates with some experience as Junior Trade Commissioner or as Assistant to Trade Commissioner. They should be, preferably, business men of prepossessing personality, tact, fluency in conversation, facility in writing terse English, and ability to investigate and get accurate commercial information. A knowledge of Spanish is desirable.

*A Law Clerk for the Soldier Settlement Board; Salary \$1,800 per annum.*

II. A Law Clerk for the Soldier Settlement Board at an initial salary of \$1,800 per annum. Candidates must have education equivalent to graduation from a recognized school of law; they should have at least one year's general law practice; a knowledge of modern office practice, and supervisory ability.

*A Hydrometric Recorder for the Reclamation Service at Calgary; Salary \$1,500 per annum.*

III. A Hydrometric Recorder for the Reclamation Service at Calgary, Department of the Interior, at an initial salary of \$1,500 per annum. Applicants should be science graduates of a recognized university, or be members or associate members of the Engineering Institute of Canada, the British Insti-

tute of Civil Engineers or the American Society of Civil Engineers. They should be not more than thirty-five years of age, and of strong constitution.

*A Hydrometric Recorder for the B.C. Hydrometric Survey, Dominion Water Power Branch; Salary \$1,500 per annum.*

IV. A Hydrometric Recorder for the B.C. Hydrometric Survey, Dominion Water Power Branch, Department of the Interior, at an initial salary of \$1,500 per annum. Applicants should not be more than 35 years of age; they should be graduates in engineering of some recognized Canadian or British university and should have at least two years' experience in field and office engineering, a portion of which must include stream measurement and general hydrometric survey work, preferably in British Columbia.

*An Assistant to the Flax Specialist, Experimental Farm, Ottawa; Salary \$1,380 per annum.*

V. An Assistant to the Flax Specialist, Experimental Farm, Ottawa, Department of Agriculture, at a salary of \$1,380 per annum. Candidates should have education equivalent to high school graduation, preferably, with some university or agricultural college training. They should have a thorough knowledge of the agricultural and manufacturing branches of the flax industry, with special reference to retting, scutching, hackling and grading fibres. A knowledge of office work is desirable.

*An Assistant in the Motion Picture Division of the Exhibits and Publicity Bureau; Salary \$840 per annum.*

VI. An assistant in the Motion Picture Division of the Exhibits and Publicity Bureau of the Department of Trade and Commerce at an initial salary of \$840 per annum. Preference will be given to applicants with a knowledge of photography and the operation of motion picture projection machines.

#### General Directions.

The salaries for the above positions will be supplemented by such bonus as may be provided by Parliament.

Selections for eligible lists of applicants qualified to fill similar vacancies which may occur in future may be made from the applications for these positions.

According to law, preference is given to returned soldier applicants, possessing the minimum qualifications. Returned soldiers must furnish a certified copy of their discharge certificates, or in the case of commissioned officers, a certified statement of their military services.

In the case of positions numbers 3 and 4 attention is drawn to the fact that appointments to these positions shall be made, so far as practicable, from bona fide residents of the province in which the position is situated.

Application forms properly filled in, must be filed in the office of the Civil Service Commission not later than August 22. Application forms may be obtained from the Dominion-Provincial Employment Offices or the Secretary of the Civil Service Commission, Ottawa.

By order of the Commission,  
W. FORAN,  
Secretary.

Ottawa, July 24, 1919.

### Accidents at Railway Crossings.

At 1,028 urban and 1,049 rural protected railway crossings and 3,822 urban and 20,985 rural unprotected crossings 73 people were killed and 132 injured by railway trains in Canada during 1918, according to statistics compiled by the Department of Railways and Canals.

### Railway Despatching.

On the railways of Canada during 1917-18 train despatching by telegraph was practised exclusively on 21,811 miles of line; on 9,922 miles of line trains were despatched by telephone alone, and on 5,867 miles both telegraph and telephone were used, as stated in railway statistics for the year ended June 31, 1918, issued by the Department of Railways and Canals.

### Buy Thrift Stamps for children.

## CODE OF PRINCIPLES FOR GAME PRESERVATION

### Leading Wild Life Conservator Presents Proposals for Adoption into Rules of Action for Saving Wild Game.

At the National Conference on Conservation of Game, fur-bearing animals and other wild life, held in Ottawa under the direction of the Commission of Conservation in co-operation with the Advisory Board on Wild Life Protection, Dr. W. T. Hornaday, Director, New York Zoological Park, addressed the Conference on the subject of the "Rational Utilization of Game Animals." The address, which is to be published in due time by the Commission of Conservation, is reproduced in part below, as follows:—

"The words 'rational utilization of game' immediately send my thoughts travelling into a region where the utilization of game has now become more than ever a burning question. I refer to the regions of the far north, sometimes called the inhospitable regions of the north, where the wild game of the country constitutes each year a very important part of the solid food of the white population. It is not my purpose to enter into detail into a consideration of the needs and the rights of the Eskimo, the Indians and the wild tribes of that region; I am thinking mostly of the white population. We know that white settlements are pushing farther and farther into Alaska and northern Canada. We know that conditions are changing rapidly these days, in Alaska, at least. Conditions have so changed during the past ten years that it is now time to take thought for the morrow and proceed along new lines.

#### WILD LIFE IN THE HANDS OF MAN.

"In every new country man struggles mightily to harmonize with his environment and survive. Naturally it is the newest countries that contain the most wild life. It is the way of the average frontiersman to make war on the game and war on every man who seriously attempts to protect it from his onslaughts. In every country, new or old, the utilization of the wild game, and its perpetuation or extinction, are all determinable by the inexorable rules of logic, and of reasoning from cause to effect.

"The interests of a great number of people are paramount to the interests of a few. To the conservationist of natural resources, waste is abhorrent, and the extermination of valuable species is a crime. The robbery of posterity is wicked and repulsive; and all robbery deserves to either be prevented or punished.

"In every well-settled country containing a fair supply of game birds, game and fur quadrupeds and food fishes, the questions involved in the taking and utilization of those assets of nature create an irrepressible conflict. Every country produces its annual crop of uncompromising destroyers, and some countries contain a few real conservators.

"The western world contains few fanatics of the oriental type to whom all killing is abhorrent and wicked. The white races of men believe in the doctrine of legitimate sport and sensible utilization; but the game hog is a constant menace.

"The game hog is a factor which every government and every individual game protector must reckon. In the slaughter of game he has no conscience, and to him game laws are an intolerable evil. He is utterly devoid of sentimental or scientific interest in wild life, and he will go far to kill the last representative of a species in order to boast of it. Some game hogs, who are honestly what they are, can be educated out of their evil ways, and reformed; but others can not be. The last annual report of the New York

State Conservation Commissioner, George D. Pratt, contains this striking passage regarding the confirmed game hogs of the Adirondacks who slaughter deer illegally and for whom no one can plead the excuse of ignorance. Commissioner Pratt says:

"An analysis of the violations thus reveals that they were due not to dissatisfaction with any one law, but to general contempt for the Conservation law, per se. The protectors (disguised as sportsmen) were all required to report whether the hunters in the camps to which they assigned operated on the general plan of killing practically everything that they saw, and more than two-thirds of the protectors answered this question in the affirmative. The result of this determination is shown in 101 deer that came within the protectors' immediate knowledge and in most cases under their personal observation; 46 were bucks, 44 were does, and 11 were fawns of both sexes. It was a matter of great interest in one camp that one man had killed eight does in the season, while another at the same camp, by a singular coincidence had killed eight bucks." It is to be remarked that the killing of does in the Adirondacks or anywhere in the State of New York is entirely illegal.

#### ILLEGALLY KILLED DEER.

"There were many more deer illegally killed than those mentioned above," says the Commissioner, regarding which the protectors obtained evidence that resulted in settlements or convictions. Cases arising from the 1917 work were settled for \$3,511.50. They involved 79 individuals and more than 125 violations. Already in 1918, 38 cases have been settled, with a total recovery so far of \$4,245. The 1918 cases alone will number between two and three hundred when all have been closed.

"The Commission wishes particularly to point out that the violations of the deer law involve no particular class or locality more than another. Men of all walks of life are involved, and even some women, who deliberately stood upon runways in wait for deer that were being run by dogs. Efforts to correct the old outworn point of view regarding wild life, a point of view that would make game the property of whoever can get it, regardless of law, must accordingly be directed to every class and locality.

#### AGAINST HUMAN VULTURES.

"Now in the making of laws it is always necessary to make the laws adequate to curb the worst elements. No sooner is a new game law enacted than the human vultures who prey upon wild life immediately scrutinize it and study it in order to find its weak spots, and to plan evasions. It is this devilish spirit of criminality that renders it so difficult to provide for the utmost utilization of wild game as food for man. Whenever we see the day wherein all men will gladly obey the spirit of a law, as well as its stern letter, then we may say that the millennium of game protection has arrived.

"The continuous development of the interior regions of Alaska and northern Canada, the increase in power transportation, of mining and of general exploitation, has brought a corresponding increase of pressure on the remainder of big game. The valleys of very few navigable streams now contain any considerable remainder of moose, caribou, mountain sheep or bear. To find big game now it is necessary to strike into the interior. The great herds of caribou that only forty years ago came within gunshot of St. Michaels, Alaska, at the mouth of the Yukon, have vanished from the lower Yukon almost as completely as if they had never known that region. Now the residents of St. Michaels must travel hundreds of miles to find the nearest herds of the caribou millions.

But the disappearance of northern big game is a large subject and not to

be entered upon here. We are concerned with the national utilization of the stock that remains. The practical questions now before the people of Canada and Alaska are as follows:—

(1) How can we secure the most through legitimate utilization of wild game?

(2) How can wastefulness be prevented?

(3) How can the continuity of supply be insured?

"The moment we undertake to conserve big game in the northern two-thirds of Alaska, which is north of the 62nd parallel of latitude, we come up against some strenuous demands for the sale of game. Fairbanks now is the storm-centre of a new demand for the sale of game all the year round instead of in the open season only. Most Alaskans believe that the game of Alaska belongs to the people of that territory, that they should administer it as they think best and above all that the sale of game is not only right but absolutely necessary.

"In 1918 it was noted that the laws of the United States were permitting the sale of moose, mountain sheep and caribou meat during the open season for hunting, everywhere in Alaska north of latitude 62 degrees, and that during the year 1917, 6,000 pounds of big game meat lawfully had been fed to the labourers employed on the construction of the Alaska Central Railway, actually under the supervision of the present Governor of Alaska. That large figure was given by Mr. Thomas Riggs himself, then Alaska Railway Commissioner, at the hearing on the Sulzer Bill, in Congress on March 5, 1918.

"The Sulzer Bill proposed that mountain sheep, moose and caribou meat should be sold all the year round, everywhere north of latitude 62 degrees, and it was ardently supported by Mr. Riggs and the people of Fairbanks. The Sulzer Bill promised to be so destructive to the big game of Alaska that it was easily killed. The episode emphasized with new force the fact that a new game act for Alaska now has become an absolute necessity, and must be worked out in the near future.

#### LIVING CONDITIONS IN NORTH.

"Every conservator of American big game is at least partially aware of the conditions that surround white people who live all the year round in the northern regions of Canada and Alaska. Away from the influence of the lines of power transportation, the procuring of supplies of fresh meat from the flocks and herds of the stockraiser and the farmer is an impossibility. And it is not good that men, women and children should be compelled to subsist for long periods on no other flesh food than dried fish, dried venison, bacon and ham. If we concede that it is right for the trader, the missionary and the soldier of fortune to live in the far north and rear families there, then we must concede that they are entitled to some supplies of fresh meat from the wild herds that can afford them without the risk of extermination. In the language of commerce we believe that they are entitled to all the traffic will stand.

"The question is, how can we meet the legitimate needs of the widow of Fort Churchill, the trader at Fort Resolution, and the missionary at Point Barrow, without the risk of annihilating the breeding stock. Let us assume that no one of these can go out, license in hand, and himself hunt and kill his own lawful quota of game.

"In the utilization of the wild game food of these regions, the non-hunters must be fatally penalized, because of their physical and other disabilities that prevent them from personally procuring their own share of game on the hoof. Now, what is to be done?

"The men of the far north at once will say:

'Provide by law that all those who cannot hunt may buy their share of game from those who can hunt.'

"This proposal merits careful analysis and consideration. It is now a widely accepted principle of conservation that no wild species can long withstand commercial exploitation. It is an accepted fact that the surest way quickly to exterminate any wild species is by placing a cash price on the heads of its members.

#### OPPOSITION TO SALE OF GAME.

"Throughout the whole of the United States and I think all of southern Canada, the conservers of wild life are

a fixed and unalterable unit in opposition to the sale of game anywhere in those regions. That matter has been considered and at times fought over, for fully ten years; and if any principles in wild life protection can be regarded as settled for all time, it is the ban on the sale of game, and on the sale of the plumage of wild birds. The Sulzer Bill could have been, and would have been buried under a mountain of opposition had it been pressed forward.

"In view of the well-known and legally recorded beliefs of the wild life conservationists of Canada and of the United States, I now regard it as a waste of time to attempt to devise ways and means for the sale of wild game. The principle that lately has been so gloriously reaffirmed and so everlastingly fixed by the international treaty between Canada and the United States for the protection of migratory game birds against the market hunter and the game dealer, must now be discredited in the far north. The time has come that the sale of game in Alaska must positively stop before it has brought more harm to the game and to the people of Alaska.

"It is a curious circumstance that the men who thus far have saved some of the game of Alaska from annihilation have done so without either appreciation or thanks from the people of Alaska. But for the initiative of meddlesome Eastern naturalists in 1902, by this time the accessible regions of Alaska would have been swept bare of hoofed game. It is utter folly to assume or to believe that the people of Alaska alone are either willing or able to protect their big game from extermination and utilize it on a real continuing basis. In times like the present the truth may better be told bluntly than in any roundabout way.

"The people of Alaska are from first to last diligent exploiters of the natural resources of Alaska, and the majority of the white population look forward to getting out of that territory to spend the remainder of their lives elsewhere. Twenty-five years hence a majority of the Alaskans may be sincere conservers, but a quarter of a century is a long time to wait, and in the interval much mischief may be accomplished.

"No, we cannot agree to any sale of game anywhere, because that policy is known to be extra destructive. At all hazards the big game of Alaska and Northern Canada should be conserved on a continuing basis, for the good of the residents of those difficult regions.

"The hunters of Alaska may find it impossible to believe that eastern sportsmen have at heart the welfare of the future residents of Alaska, who will need wild meat. No doubt many of them feel that all the protective efforts of United States men are designed to protect United States hunting grounds, but all misunderstandings of our motives in Alaskan conservation we must accept as an unavoidable part of the burden and as coming all in the day's work.

"I believe that on this point we are indeed thinking more of the welfare of the Alaskans of the future than is thought by the Alaskans of to-day.

"And now what can we offer as an attempt at a solution of the puzzling question raised by the widow at Fort Churchill? It is time to put forth something intended to be constructive. We are absolutely certain that a way can be found to protect the rights of the widow, the missionary, and the trader without the surrender of a great foundation principle, and without going halfway to meet disaster by providing for the sale of game.

"In an effort to be both brief and clear, we submit the following proposals as candidates for adoption into a code of principles:—

#### PROPOSED PRINCIPLES.

1. In the well-settled regions of the United States and Canada the supply of wild game is nowhere sufficient to render it an important food supply; and in view of its steady destruction by man, predatory mammals and birds, severe winters and scarcity of food and cover, game killing in those regions must be regarded as a severely limited pastime and not as an industry in competition with the stock raiser and the butcher.

[Continued on page 8.]

## MERCURY DEPOSITS OF BRITISH COLUMBIA AWAIT DEVELOPMENT

*Revival of Mercury Mining Industry a Possibility and Considerable Quantities of Ore are Available.*

### USES OF MERCURY

Among the important minerals in Canada waiting development are the mercury deposits of British Columbia, which are somewhat extensive, as the Geological Survey records show, and in these reports it is stated that the failure of the industry in the past was due not to the grade or character of the ore, but to other causes.

In the Summary Report, 1918, Part B, of the Geological Survey, Department of Mines, a description is given of some of these deposits in a paper prepared by Mr. Charles Camsell, from which the following extracts are taken:—

"The mercury deposits of Kamloops lake occur at intervals along a belt 25 miles in length, which extends from the west end of the lake northward to Criss creek and southward to Tunkwa lake. The principal deposits are situated in the Copper Creek valley, one group lying at the mouth of the creek overlooking Kamloops lake, and another group about four miles up the creek on the east side. Other deposits of less importance occur at Tunkwa lake at the mouth of Threemile creek and also in the valley of Criss creek.

### CHARACTER OF THE DEPOSITS.

"The deposits are all of similar character. They occupy fissures which have no regular or uniform strike, and which traverse both the Nicola series and the Tertiary volcanic rocks. In many places they are closely associated with dykes of rhyolite or porphyry. The veins carry cinnabar, frequently associated with stibnite in a gangue of quartz, calcite, or dolomite, which weathers to a rusty outcrop. The deposits filled what were once open fissures, for a well-defined comb structure is frequently apparent. In some places the veins have a brecciated character and in others a banded structure. Specimens indicate that the calcite and quartz were introduced after the deposition of the cinnabar and stibnite, and also after the brecciation of the veins. The walls of the veins for a few inches on either side show alteration by the solutions which passed through them.

"The deposits have probably been formed as after effects of late Tertiary volcanic activity and are due to the circulation of mercury-bearing waters through fractured parts of the country rocks and the concentration of cinnabar in some of the veins. As in most other cinnabar districts of the world, these deposits were probably formed near the surface and are not likely to extend to any great depth, and in the development of the deposits this should always be borne in mind.

"No attempt was made to determine the grade of the deposits by sampling, but it is stated that in the first work of the British Columbia Cinnabar Company, in 1895 to 1896, 114 flasks of mercury were extracted in retorts from 150 tons of ore, which would make the grade of ore treated 2.9 per cent. This, however, was picked high-grade ore. The low-grade ore as sampled by J. D. Kendall in 1896 yielded only 0.3 per cent of mercury. Other estimates of the ore range from 1 to 2 per cent.

### CINNABAR OF BRITISH COLUMBIA.

"The property of this company consists of a group of nine, crown granted, mineral claims, situated on the shore of

## CODE OF PRINCIPLES FOR GAME PRESERVATION

### Leading Wild Life Conservator Presents Proposals for Adoption into Rules of Action for Saving Wild Game.

[Continued from page 7.]

2. In well-settled regions it is impossible to make bag limits too small, or open seasons too short, for the best continuance of the game supply.
3. No frontiersman can reasonably be expected either to devise or to execute, unaided by his Federal Government, methods for the adequate preservation and increase of large game.
4. Well-settled and well-fed regions require game laws of greater stringency than frontier regions.
5. Frontier and savage regions require to be especially defined on the map and provided with game laws specially adapted to the needs of their inhabitants and the available supply of game.
6. The strict regulation of game-killing in frontier regions inured directly to the benefit of the people most dependent on the game for existence.
7. The sale of game should not be permitted at any time anywhere; because all commercialization of wild game and other forms of wild life is thoroughly exterminatory in its effects.
8. In all countries the rational utilization of wild game, but only on a basis that will provide amply and adequately for the perpetuation of the breeding stock.
9. Regions that are remote from lines of power transportation, or are in winter entirely cut off from supplies of fresh meat from without, are entitled to preferential treatment.
10. The relief of persons inhabiting frontier regions who by reason of sex, age, or other causes are unable themselves to take out licenses and hunt and kill their animal quota of game must be specially provided for by the law.
11. Every community large enough to contain a post office should be established as a game protection

Kamloops lake at the mouth of Copper creek. The group is favourably situated for transportation, for the main line of the Canadian Northern railway runs through the property and the station of Copper Creek is within half a mile of the outcrop of the deposits.

"The deposits are situated 400 or 500 feet above the lake level on an open hillside, which is timbered higher up.

"Cinnabar occurs in these deposits in a number of small veins. Owing to the drift-covered nature of the hillside and the broken-down character of all the underground workings, it was impossible to determine the number of veins, or in most cases their width. It is stated on good authority, however, that there is a considerable number of these veins with widths ranging from 2 inches to 2 feet. Sampling of these veins by the owners indicate that the grade of the ore ranges from 0.3 per cent to about 10 per cent. The average, however, would likely be in the neighbourhood of 1 per cent. The total production from these deposits during the time when the retort plant was in operation, 1895 to 1897, was 138 flasks, equivalent to 10,557 pounds of mercury. The failure of this industry is attributed to the heavy losses in the furnace and not to the grade or character of the ore.

"The claims of the Hardie Mountain mines are situated 4 miles up Copper creek on the eastern slope of the valley. They consist of fourteen claims. The deposits are all situated near the top of the mountain.

### OTHER DEPOSITS ABOUT KAM- LOOPS LAKE.

"The Independent group is situated near Sabiston flat, about 2 miles west of Copper creek. The veins are dolomitic in character and are situated in a pink porphyritic rock which traverses

centre or unit and a deputy game warden should be appointed for each centre, to whom an annual salary should be paid during satisfactory service, no matter how small the salary might be.

12. The duty of every such deputy game warden should be to issue hunting licenses, check up the reports of license holders, and generally promote and be responsible for the observance of the laws affecting game.

13. The cold storage of legally killed game to promote its full utilization by the holders of hunting licenses, beyond the regular season for hunting, is desirable and necessary.

14. It is time for the Governments of Canada and the United States to stop all killing of female hoofed game other than caribou, by Indians, by prospectors, and by all other persons.

15. The waste of game should under certain fixed conditions be made a penal offence.

16. Regulations should be framed to require the reasonable salvage of game meat by sportsmen.

"It would be placing a very low estimate on the mental fertility of Canadian and American lawmakers to assume that it is impossible for them to provide a share of caribou meat and snow geese for the widow and the missionary without the sale of game. To the lay mind it seems entirely possible to work out a scheme for having a certain amount of hunting by proxy under special licenses prepared and issued to meet such cases. The game warden or his deputy, or in their absence some other Government officer, could determine the merits of each application and exercise the discretion of issuing or not issuing a license to hunt by proxy. The holder of such a license could be relied on to find a suitable person to act as a proxy, go out and haul in the meat for a daily wage consideration."

### Save by the W.S.S. method.

volcanic rocks of the Nicola series. These rocks show the effects of considerable disturbance and are much shattered and faulted and the lines of fracture run in all directions. The principal vein, on which a short tunnel has been run, is about 4 inches wide, and the quantity of cinnabar in it is not great. No work has been done on this group for several years, and no production has ever been made.

"The Summit claim is situated near Tunkwa lake at the head of Threemile creek, on what is called the Summer range. The wagon road from Savona to Mamit lake runs by the outcrop of the deposit, which is about 14 miles from Savona. The country rock is a volcanic breccia, probably of Triassic age, which has been fractured and brecciated. Dolomitization has taken place along some of the fracture zones and this has been accompanied by mineralization by cinnabar and a little stibnite. Later fracturing has allowed the introduction of quartz into the veins. The deposit on which the development work has been done is a vein a few inches wide which appears to strike northeast and dips about 75 degrees to the southeast. A slight impregnation by cinnabar, of the wall rocks on either side for several inches, is occasionally noticeable.

"The deposit is said to run about 1½ per cent mercury for a width of 1 foot. The development work consists of a shaft 15 feet in depth and a pit about 6 feet deep.

"Float cinnabar was found some years ago in Criss creek and afterwards traced to deposits in place on the north side of the creek, about 4 miles from its mouth. At the time of our visit these deposits could not be found and an examination of them could not be made. The rocks, however, are

volcanic rocks of Triassic age, overlaid by agglomerates, tuffs, and conglomerates of Tertiary age. The former show the same bands of dolomitization as appear at the mouth of Copper creek and the cinnabar deposits are said to occur in these dolomite bands. Samples of high-grade mercury stated to have come from Criss creek were shown us, which must have come from a vein at least 4 inches wide.

### OTHER BRITISH COLUMBIA MERCURY DEPOSITS.

"Native mercury has been reported as occurring in the silver ore of Silver peak near Hope. It also occurs at Sechart channel, Barclay sound, on the west coast of Vancouver island, in minute globules scattered through a vein of cinnabar traversing a greenish felsitic rock. Mercury has also been found in the gravels of Kicking Horse valley, near Field, but an examination made by J. A. Allan in 1913 failed to reveal the original source of the mercury, or whether or not it was likely to be present in commercial quantities.

### FOREIGN DEPOSITS.

"The United States and Mexico are the only producers of mercury in America.

"Over 70 per cent of the mercury produced in the United States is obtained from Californian deposits. The remainder is produced in Texas and Nevada, and a small quantity comes from Oregon and Washington. These deposits are veins, stockworks, fractured zones or chambered breccia veins occurring in rocks of any composition, but mainly of Tertiary or Quaternary age.

"The deposits are generally small and decrease in size or give out in depth. They are as a rule confined to the upper vein zone and many of them do not go more than 400 feet below the surface. They have been formed in late geological times and are closely related to volcanic activity, many of them being associated with hot springs.

"The average grade of the ore now being mined in California is about 0.4 per cent of mercury, and the cost of producing is in the neighbourhood of \$1 per pound. The Texas deposits run about 4 per cent.

"European supplies are obtained from Spain, Austria, and Italy.

The Almaden mines in Spain, which are the largest mercury mines in the world, yield mercury at a cost of \$16 per flask from cinnabar ore averaging 11 per cent mercury.

"The Italian deposits average about 1 per cent and the Austrian about 0.85 per cent. Other deposits occur in Germany, Russia, Asia Minor, China, Serbia, Australia, and New Zealand.

### USES.

"Mercury is used in medicine, electrical apparatus, batteries, vermilion, amalgamating of gold and silver, measuring instruments, paints, cosmetics, floating lights, in lighthouses, and in power plants. The requirements of Canadian users are about 200,000 pounds annually."

## INCREASE SHOWN IN HOMESTEADS GRANTED

The following figures on homesteading are supplied by the Department of Immigration and Colonization:—

During the period ended July 8 there were 216 homesteads entered (no soldier grants included); last year, 127. Nationality of those who made entry: British, 76; Canadian, 68; American, 44; French, 1; Scandinavian, 12; other European, 12; not stated, 3.

### Welland Canal Traffic.

During the eight months it was in operation last year a total of 2,816 vessels passed through the Welland canal, a considerable increase in traffic over both the years immediately preceding, according to the annual report of the Department of Railways and Canals.

War Savings Stamps pay 4½% compounded half-yearly.



## ECONOMIC METHODS IN DOMESTIC HEATING, IS SUBJECT OF BULLETIN

Department of Mines Gives Expert Advice as to House Heating

### HOW TO SAVE COAL

From a bulletin on the subject of the "Economic Use of Coal for Steam-Raising and House-Heating," by John Blizard, B.Sc., Fuels and Fuel-Testing Division, Mines Branch, Department of Mines, practical advice to householders on the use of coal in domestic heating is reproduced below, in part, as follows:—

#### TEMPERATURE.

The heat required to maintain a house at a definite temperature varies directly as the difference between that temperature and the temperature of the outside air. If, during a heating season, the mean outside temperature is 30° F., and seven tons of coal are used to keep the temperature inside at 70° F., then about one ton more will be used to maintain this temperature than would be required to maintain the house at only 65° F. It is most important, therefore, not to over-heat a house.

Experience shows that the average person feels no discomfort in a house heated only to 60° F., at the beginning of the heating season, and he does not require a temperature greater than 68° F. to 70° F. in the middle of winter.

#### HUMIDITY IN THE HOUSE.

When the outside temperature falls below 45° F. the house may be rendered more comfortable and healthy to the occupants by partially saturating the air with steam. This process is known as humidifying or moistening the air, and when used it is possible to keep the house comfortable at a temperature several degrees lower than when it is not used.

While schemes for humidification of the air are undoubtedly desirable, they are not necessarily a means of saving coal. This is because, in the average house, the heat used to evaporate the water to moisten the air is greater than that gained by maintaining the house at a lower temperature. To save coal it would be necessary for evaporating this water to use the hot flue gases leaving the furnace instead of the heat which would otherwise be used to raise the temperature of the house.

#### AIR LEAKAGE INTO THE HOUSE.

All air should as far as possible be excluded from entering the house through crevices, by means of weather strips and other devices. In bedrooms and living rooms air may be admitted through the window when required; but when these rooms are not in use they should be closed as tightly as possible.

At night, when the bedroom window is open, cover up the radiators with rugs or close the hot air registers, and so avoid using up heat which would go otherwise to warm the remainder of the house. All rooms not required during the winter should be sealed up, and little or no heat supplied to them.

#### REGULATING THE FURNACE.

The furnace should be so regulated that the temperature in the house remains fairly constant. It may be possible to have the temperature somewhat lower in the morning when the occupants of the house are moving about, than later in the day, but this change should neither be very great nor should it be suddenly raised by burning coal in the furnace rapidly for short periods.

#### BURNING THE COAL.

The rate at which the coal is used up in the furnace depends entirely upon the rate at which the air passes up through the fuel bed. The supply of air converts the coal substance into a

## FREIGHT CAR CAPACITY OF CANADIAN RAILWAYS

The capacity of freight cars on Canadian railways is shown in the following table, which is taken from the annual report of the Department of Railways and Canals for 1918:—

	1915.		1917.		1918.	
	No.	Capacity in tons.	No.	Capacity in tons.	No.	Capacity in tons.
Box.....	145,307	4,825,543	145,290	4,899,651	150,074	5,126,659
Flat.....	25,315	798,671	25,322	816,245	23,414	759,768
Stock.....	7,638	236,190	7,883	232,185	8,556	253,350
Coal.....	15,703	611,020	15,649	538,609	16,949	692,785
Tank.....	463	14,604	731	35,134	485	16,306
Refrigerator.....	4,713	139,350	5,234	155,510	5,893	176,890
Other.....	2,551	99,677	3,390	137,122	3,664	141,012
Totals.....	201,690	6,731,265	203,499	6,798,456	209,026	7,166,770

The capacity of 217 cars was not reported.

gas. It oxidizes the lower layers of the coal, the heat from which distills the gases from the upper fresh charge. But it is impossible to supply sufficient air beneath the average fire bed to burn the gases completely. To complete the combustion, a second current of air must be supplied above the bed of coal. This second current of air should be regulated by opening or closing the damper in the fire door to suit the quantity of combustible gases rising from the fuel bed. The flow of these gases will depend upon the quantity of air passing through the fuel bed, the condition of the fuel bed, and the presence of freshly fired coal. After the coal has been charged and the coal gas from it evolved, the damper in the fire door may be almost or even completely closed, since with the ordinary fire door sufficient air leaks through its crevices to supply sufficient air to burn the combustible portion of the gases then leaving the fuel. Experience alone will show the best method of operating a particular furnace, but the following is a rational scheme of working:—

Immediately after firing a new charge of coal on to a hot bed of coals, close the ash-pit door and admit a good supply of air through the fire door to burn the gases distilled from the coal. After these gases have passed off, less air over the fire is required, and it is then possible to adjust the furnace so that it may heat the house for some hours without attention. The amount of coal burned during this time will depend on the quantity of air which passes through the grate and up through the fire. This flow of air varies with the thickness of the fire, the size of the fuel, the quantity of ashes on the bars, and the "pull" or draft on the top of the fire which tends to draw the air through it. The "pull" or draft is caused partly by the furnace, and principally by the chimney, which contain gases at a higher temperature and lighter than the outside air. These light gases tend to rise in the furnace and chimney, and pull behind them air through and over the fire bed. Their effect in drawing the air through the fire bed may be reduced, by turning the damper in the flue, by admitting air into the flue or through the fire door, and by closing the damper in the ash-pit door. The damper in the flue throttles the flow of gases. Care must be taken not to close it to a point where the chimney draft is so slight that poisonous gases from the furnace pass to the house. Nor should it be closed soon after firing, unless the gases over the fire are burning freely, since by doing so the rising column of unburnt gases and air may explode. The air admitted into the flue acts as a damper, because it cools the gases passing to the chimney, and takes the place of air which would otherwise pass through and over the fire bed.

The first draft to be closed should be the turn damper in the flue; if this

does not throttle down the air sufficiently, close the draft in the ash-pit door and also the draft in the fire door in order to maintain the correct proportions of air above and below the fire. If the draft is still too strong, open the damper which admits air to the flue pipe, and finally, if required, open again the damper in the fire door. There are two good reasons for using as little as possible those dampers which reduce the draft by allowing air to pass in and cool the gases. In the first place it is clear that the air must all come originally from outside and so cool the house, and, secondly, that it will cool the hot gases and so prevent them from giving up as much heat to the house in passing through the flue or furnace as they would do when not mixed and cooled by the air. When, in spite of reducing the draft by the turn-damper and ash-pit door damper, the coal still burns too freely, a better plan than using the other dampers is to either burn a smaller size coal or to supplement that already in use with buck-wheat or other very small coal.

For the same draft a thin fire will burn more rapidly than a thick fire, since it offers less resistance to the flow of air through it. In mild weather it is wrong, therefore, to try to burn the coal less rapidly by decreasing the thickness of the fire below that prescribed by the makers of the furnace. On the other hand, in cold weather if there is too poor a draft to burn the necessary amount of fuel in a deep fire bed, a shallower fire may be used, but it will require more frequent attention. The fire must never be allowed to become dead or burn through in patches, since large quantities of air flow through them and cool the furnace.

#### SIFTING ASHES.

The direct return to be gained by sifting the ashes from a furnace will depend largely on whether the grates are in good repair and whether the air spaces in them are so large that a portion of the coal may pass through with the ash. After sifting, the pieces of ash and clinker left above the screen or sieve must be separated from the fuel, and only the latter returned to the fire. The residue is in smaller pieces than the original coal, and is an ideal fuel for placing over the fire at night or at other times when it is desired to reduce the rate of combustion of the coal.

#### CHEMICALS TO IMPROVE COMBUSTION.

Compounds appear on the market from time to time, under various names, which are supposed to cause the coal to give out more heat. The sellers of some of these articles recommend that they be sprinkled in small quantities, about one pound to a ton, on the coal before firing, or on the ashes after their removal and before returning them to

the furnace. Since coal burnt completely in air gives out all the heat it contains, and since it is impossible to burn the ash in the coal, these articles can neither increase the heat energy in the coal nor endow ash with heat energy. If these compounds contained a large percentage of oxygen, the amount would not be sufficient for the combustion of half their weight of good coal. Would-be purchasers are strongly advised not to listen to the extravagant claims made by agents for their sale, and to devote their attention to the scientific combustion of their coal with the oxygen of the air, which may be easily obtained free of cost.

#### AIR LEAKAGE IN THE FURNACE.

Dampers in the furnace and flue are provided for the purpose of supplying the air necessary for burning and regulating the rate of combustion of the coal. Any other supply of air is wasteful. Care should be taken to see that the cleaning door closes tightly and that crevices through which air is drawn are filled with cement or putty.

#### SOOT REMOVAL.

All soot must be removed at frequent intervals from the interior of the furnace and gas passages. A very thin deposit of soot retards the transmission of heat to the water or air.

## MUCH OF HEAT ENERGY IN COAL IS WASTED

The heat energy content, or caloric value of coal, is commonly given in British thermal units (B.Th.U.) per pound. The British thermal unit is 1/180 part of the quantity of heat required to raise one pound of water from 32° F. to 212° F. This energy is liberated by burning the coal, and is used for heating purposes, or for doing work in a heat engine.

It is possible to make use of practically all the energy in coal, for heating purposes, but is impracticable, since it would involve the installation of a bulky and expensive plant. The efficiency of a modern steam boiler plant seldom exceeds 80 per cent; not because it is the absolute limit to the possible efficiency, but because it is not economical to build a more elaborate installation to improve it. For the generation of power, however, it is possible to use only a small fraction of the heat energy of coal; for example, a modern steam turbine plant seldom attains an efficiency of over 20 per cent, as stated in a recent bulletin issued by the Mines Branch, Department of Mines, entitled "The Economic Use of Coal for Steam Raising and House Heating," by John Blizard, B.Sc., Technical Engineer, Fuel and Fuel-Testing Division. The principal and almost sole inflammable constituents of coal, the bulletin continues, consist of carbon and hydrogen, largely in the form of compounds of both, known as hydrocarbons.

#### Heat Less from Steam Pipes.

A bare steam pipe of 6 inches diameter, containing steam at 100 pounds per square inch pressure, loses heat equivalent to about three-fourths of a pound of steam per hour for every foot of its surface exposed to the air. The higher the temperature in the pipe, and the smaller the diameter of the pipe, the greater are the heat losses per square foot of exposed area. A covering of good insulating material will reduce this loss to an extent that depends on its quality and thickness, it is stated in a bulletin issued by the Fuel and Fuels Testing Division, Mines Branch, Department of Mines.

#### Unit Length of Survey.

The standard of length of the Geodetic Survey of Canada is a nickel bar, known as Number 10239. This bar is of H form section, total length about 102.6 cm., and length of side about 2.5 cm. The graduations are on the natural plane of the bar, and are at each millimetre from 0 to 100 cm. A millimetre scale divided into tenths is added immediately beyond each end of the fundamental distance 0-100 cm., as stated in a bulletin issued by the Geodetic Survey, Department of the Interior.

## MADE UP FOR SLIGHT DECLINE IN EMPLOYMENT

*Increase Shown in Official Figures for Second Week in July—Statistics by Employment Service, Department of Labour.*

### SOME TRADES SLACK

Employers' reports to the Employment Service of the Department of Labour indicate the decline in the volume of employment in Ontario and Quebec during the first week of July was more than made up by an increase during the second week of July. Moreover, an additional increase was anticipated during the succeeding week.

Final returns for the week ending July 5 showed that 2,736 Ontario and Quebec firms with a pay-roll of 374,728 persons had decreased their staffs by 2,733 persons, or 0.73 per cent, during the week ending on that date. This decline, as forecasted in the last weekly employers' report, proved to be only a temporary setback. Preliminary returns for the week ending July 12 show that the increase anticipated for the week ending July 12 was realized. The 2,345 firms whose reports have already been compiled had a pay-roll on July 12 of 320,425, an actual increase during the week of 3,180 persons, or 1 per cent. These identical establishments, moreover, during the week ending July 19 expected to make a further net addition to their staffs of 1,514 persons, or 0.5 per cent.

During the week ending July 12 the plus industries (those that registered a net increase in number of employees) were: Building and construction; chemicals; leather and leather goods; metals; pulp, paper, and printing; textiles; woodworking and furniture; railroad construction; railroad operation; and miscellaneous occupations. In building and construction the anticipated increase for July 12 was 1.4 per cent and the actual increase 2.9 per cent. For the other groups the corresponding figures were: Leather and leather goods, 1.1 per cent and 6 per cent; metals, 3.6 per cent and 4 per cent; chemicals, 0.4 per cent and 0.7 per cent; textiles, 1.3 per cent and 0.1 per cent; woodworking and furniture, 1 per cent and 1.4 per cent; railroad construction, 7.1 per cent and 6.4 per cent; railroad operation, 0.5 per cent and 0.5 per cent; miscellaneous, 0.5 and 1.2 per cent. Pulp, paper, and printing changed from an anticipated decline of 0.1 per cent to an actual increase of 0.4 per cent.

The only minus industries reported during the week ending July 12 were: Commercial and mercantile; lumbering; clay, glass, and stone products; food products; vehicles; and quarrying and mining. Declines were anticipated in both the food groups and quarrying and mining, the food group expecting a decline of 0.7 per cent, whereas the actual decline was 0.8 per cent. Quarrying and mining anticipated a decline of 1 per cent, the actual decline being 2.2 per cent. The four remaining groups—commercial and mercantile; lumbering; vehicles; clay, glass, and stone products—anticipated slight increases during the week ending July 12, which were not realized. All six groups, however, with the exception of vehicles, expected to add to their staffs during the week ending July 19; vehicles group, on the other hand, registered a slight anticipated decline of 0.4 per cent.

For the whole Dominion 3,426 firms reported to the Employment Service of the Department of Labour for the week ending July 5. Of these, 190 were in Maritime Provinces, 1,839 in Ontario, 897 in Quebec, and 320 in the West.

## FIRE INSURANCE IN DOMINION IN 1918

The following table, taken from the annual report of the Superintendent of Insurance, Department of Finance, shows the fire insurance in Canada in 1918:—

Business Transacted by	Net Insurance Written.	Net in Force Dec. 31, 1918.	Net Premiums Received.	Net Losses Paid.
	\$	\$	\$	\$
1. Dominion licensees.....	4,570,798,251	4,585,923,617	35,733,383	19,285,715
2. Provincial licensees.....				
(a) Provincial companies within provinces by which they are incorporated.....	342,239,566	828,531,200	3,433,231	1,910,142
(b) Provincial companies within provinces other than those by which they are incorporated.....	32,653,304	78,561,467	257,456	134,149
(c) British and foreign companies....	594,252	635,055	7,552	8,150
Total for provincial companies.....	975,487,122	907,727,722	3,698,239	2,052,441
Grand totals.....	4,946,285,373	5,493,651,339	39,431,622	21,338,156

On July 5 these firms had 452,927 persons on their pay-roll, compared with 454,486 the previous week, or a decrease of 0.3 per cent. On the other hand, during the week ending Saturday, July 12, these same firms anticipated making a net addition to their staffs of 3,957 persons, or 0.9 per cent.

The largest single decline during the week ending July 5 was in the metal industries, where 516 firms reported a decline of 2,490 persons, or 3.8 per cent. In large part this was due to a temporary closing down for stock-taking purposes. Most of the employees thrown out of work were to be taken back during the following week.

Substantial declines during the first week in July were also registered in building and construction; clay, glass, and stone products; textiles; woodworking and furniture; shipping and longshore work.

During the week ending July 12 the only minus industries were food, drink, and tobacco; vehicles; pulp, paper, and printing; quarrying and mining. In all these cases the declines were very slight. The other fourteen industrial groups registered net anticipated increases. In the metals group an increase of 1,936 persons, or 3 per cent, was registered; in textiles, an increase of 606, or 1.3 per cent; in railway construction, 917 persons, or 4 per cent.

In the Maritime Provinces as a whole there was an anticipated decrease of 1 per cent during the week of the 12th, as compared with a decrease of 1.33 per cent the previous week; in Quebec, an anticipated increase of 0.69 per cent, as compared with an actual decrease of 0.53 per cent; in Ontario, an anticipated increase of 1.18 per cent, as compared with an actual decrease of 0.86 per cent. Employers in the four western provinces reported an anticipated increase of 1.2 per cent, as compared with an actual increase of 3.12 per cent. This increase was shared by all groups with the exception of quarrying and mining.

Strikes are not taken into account in the above figures.

### SLIGHT DECREASE.

The Employment Service of the Department of Labour reports that the employment offices established co-operatively by the Dominion and Provincial Governments show a slight decrease in the returns for the week ending July 5. The eighty-eight offices reported that 6,140 persons were referred to positions and that 5,326 had received regular employment. This is a decrease of 388 over the preceding week, when 5,714 were placed in regular work. In addition, 551 casual jobs were supplied, as compared with 539 during the previous week.

During the week 7,370 applicants were registered, of whom 675 were women and 6,695 were men. The number of

vacancies notified by employers totalled 7,370, of which 1,067 were for women and 6,303 were for men. Of the placements in regular employment 444, or 8.3 per cent, were women and 4,882, or 91.5 per cent, were men. The number of soldiers reported as placed was 2,264, or 42.5 per cent of the total.

Of the regular placements, 27 were reported by Prince Edward Island, a decrease of 4 as compared with the preceding week; 194 by Nova Scotia, a decrease of 24; 335 by New Brunswick, an increase of 91; 391 by Quebec, a decrease of 10; 1,677 by Ontario, a decrease of 385; 861 by Manitoba, an increase of 70; 673 by Saskatchewan, a decrease of 67; 535 by Alberta, a decrease of 30; and 633 by British Columbia, a decrease of 29.

### Hospital at Halifax.

Separate sealed tenders addressed to the undersigned, and endorsed "Tender for Orthopedic Factory, Bellevue Military Hospital, Halifax, N.S.," or "Garage, Bellevue Military Hospital, Halifax," as the case may be, will be received until 12 o'clock noon, Tuesday, August 12, 1919, for the construction of Orthopedic Factory, Bellevue Military Hospital, Halifax, N.S.

Plans and specification can be seen and forms of tender obtained at the offices of the Chief Architect, Department of Public Works, Ottawa; the Superintendent of Military Hospitals, Halifax; the Superintendent of Dominion Buildings, Halifax; and the Overseer of Dominion Buildings, Central Post Office, Montreal, P.Q.

Tenders will not be considered unless made on the forms supplied by the Department and in accordance with the conditions set forth therein.

Each tender must be accompanied by an accepted cheque on a chartered bank payable to the order of the Minister of Public Works, equal to 10 per cent of the amount of the tender. War Loan Bonds of the Dominion will also be accepted as security, or War Bonds and cheques if required to make up an odd amount.

By order.

R. C. DESROCHERS,  
Secretary.

Department of Public Works,  
Ottawa, July 25, 1919.

### Accident Claims Paid.

During the year 1918 accident insurance losses to the amount of \$725,815 were paid by the accident insurance companies in Canada, according to the published report of the Superintendent of Insurance, Department of Finance.

War Savings Stamps pay 4½% compounded half-yearly.

## USE OF SMALL WASTE IN WOOD MAKING PLANTS

*How Wood-using Industries Dispose of Short Ends and Trimmings for Various Mercantile Products.*

### MANY SMALL ARTICLES

There is a good field open for manufacturers of wood-distillation products, such as wood alcohol, acetic acid, turpentine and charcoal, in the use of this smaller waste, which is usually burned under the factory boilers, as stated in a bulletin on the wood-using industries of Ontario. The manner in which the manufacturers utilize the waste wood produced by their industries is indicated as follows:—

Small pieces are first sorted out and resawn and used in the factory for small parts of the factory's own products. The remainder is sold to other industries if a market can be found, or manufactured on the premises into small articles as side lines. The utilization is seldom carried beyond this point, although many factories bale their shavings and sawdust and sell them for bedding and for fibre and pulp manufacture, and for meat curing.

Sash and door factories sell or use their short ends and trimmings for the manufacture of apple, fish, and other boxes, bathroom fittings, baskets, bobbins, brush-blocks, butter moulds, dowels, firework woods, heading, game boards, insulator pins, ladder rounds, match-blocks, novelties, skewers, spindles, spoons, stakes and woodenware. They bale their common sawdust and sell it to butchers for floor covering, to manufacturers of composition novelties, and to screw factories for cleaning screws. They sell shavings for bedding, packing, and for drying wet land. Hickory and other hardwood sawdust is sold for smoking meats. Small waste pieces are sold for making ground wood-pulp, wood fibre for plaster work, and as a substitute for gravel in concrete masses.

Household-furniture factories utilize waste in the manufacture of boxes, brush backs, crates, inkstands, jardiniere stands, wastepaper baskets, rosettes, stools, tabourets and toys, and utilize cuttings of quartered oak and mahogany for wood carvings.

Boat and ship building firms reported the use of their small waste in the manufacture of boxes, boiler blocking, crates, ladder rungs, pickets, plugs, surveyors' stakes, skids, skis, toboggans, tent-pegs, wedges and whiffletrees. They sold shavings and sawdust for bedding.

Manufacturers of vehicles and vehicle supplies utilized their waste chiefly in the manufacture of handles for small tools, such as chisels, files, hammers or gimlets, and also for the manufacture of dowels, furniture squares, ladder rungs, pump handles and wheelbarrows. These manufacturers using large quantities of hickory should be able to sell their sawdust to meat packers who prefer hickory sawdust for smoking hams and bacon.

Agricultural-implement makers also have a good opportunity of manufacturing tool handles, which many of them take advantage of, using for this purpose mostly hickory and ash. They also utilize waste in the manufacture of washing machine parts and sell sawdust for concrete mixing.

Box and crate manufacturers use their material down to very small cuttings, and consequently have little useful material left. They make butts of hard maple logs into meat blocks and manufacture some small handles and mouldings and sell their shavings for bedding.

## SILVER-LEAD CLAIMS IN YUKON SHOW HIGH VALUES IN SILVER

*Galena Ores in Twelvemile  
Region Subject of Article  
in Bulletin.*

### PROMISING SHOWING

The silver-lead deposits of the Twelvemile area, Yukon, are the subject of a descriptive account in a recent report of the Geological Survey, which was prepared by Mr. W. E. Cockfield, after a visit to the area. From his account the following extracts are taken:—

#### LOCATION AND ACCESSIBILITY.

"The deposits lie within what may be termed Twelvemile area. The Chandindu or Twelvemile river is a tributary to Yukon river, joining it 17 miles below Dawson. It forks 28 miles above its mouth into two branches known as the Twelvemile and Little Twelvemile. The deposits are situated on Spotted Fawn gulch, which joins the Little Twelvemile 11 miles above its mouth. The power plant of the Yukon Gold Company is situated at the forks of the Twelvemile, and from this point a wagon road has been constructed to Dawson, a distance of 40 miles. This road joins the road up the Klondike valley in the vicinity of Bear creek. From the power plant, the flume affords a good footpath to within 6 miles of the property. From the end of the flume there is a pack trail. In winter, supplies may be hauled up the valleys of the Twelvemile and Little Twelvemile.

#### TOPOGRAPHY AND GENERAL GEOLOGY.

"The region lies wholly within the physiographic unit known as Ogilvie range. This is a spur of the Rocky Mountain system which stretches from the headwaters of Stewart river to Yukon river at the 141st meridian. This mountainous belt presents an aspect very different from that of the Yukon plateau. Beyond a somewhat general accordance of summit level it gives no evidence of ever having been planated, and probably existed as an upland tract at the time of the planation and subsequent uplift of the Yukon plateau. The range has everywhere a rugged appearance and is composed of a series of sharp ridges separated by broad, deeply-cut valleys.

"The district has been intensely glaciated and all but the highest summits have been overridden by ice. The valley spurs have been truncated and the walls rounded, giving to the depressions a U-shaped outline which is characteristic. The valleys all terminate in cirque-like depressions, holding small lakes which are being rapidly filled in and reclaimed. As a result of post-glacial changes in the drainage system the streams have cut narrow trenches in the older valley bottoms, so that the valley walls are lined with rock-cut benches. Quite frequently these narrow cleft-like canyons, and it is in one of these canyon cuttings that the ore-bodies have been located.

"The geology, as might be expected, differs widely from that of the Yukon plateau. The older crystalline schists are nowhere in evidence, and the greater part of the region is floored by sediments, which although greatly altered, have not developed a gneissoid or schistose structure. Intrusive into these are numerous bodies of acid and intermediate rocks. The sediments are divided roughly into two series, a lower and an upper. The lower consists of red and green slates, phyllites, banded cherts and quartzites, and some limestone. Rhythmical colour banding is quite frequent. The beds dip to the eastward at comparatively low angles. Overlying them, apparently conformably, is an exceedingly thick series of greyish quartzites and black slates, with intercalated impure sandy limestones. None of these beds so far as observed is fossiliferous. The lower

beds correspond both lithologically and stratigraphically with parts of the Tindir group of Cairnes and it seems probable that they belong to this group. Concerning the upper series there is more doubt, but it probably corresponds also to parts of the same group. If such is the case, the rocks are entirely pre-Middle Cambrian in age and probably belong entirely to the Pre-Cambrian. They are cut by intrusions of granite, diorite, granodiorite, andesite, and allied rocks.

#### ORE DEPOSITS.

"The ore deposits occur in the canyon of Spotted Fawn gulch, a tributary to the Little Twelvemile. A number of claims have been staked, but up to the present ore has been discovered in place on only two, the Ophir and the Galena Farm. These claims form parts of a group owned by D. B. Cole, Chris. Fothergill, C. Sproule, W. Melville, W. Elliott, and Judge Craig. At this point a dyke of porphyritic greenstone breaks through the quartzites and slates. The dyke is exposed for about 1,200 feet along the strike and has a width of 300 to 500 feet. Definite measurements of the width could not be obtained owing to superficial deposits. The veins are small fissures in the greenstone dyke, apparently being confined to it and not extending into the quartzites and slates. They traverse the dyke in a direction nearly parallel to one system of joint planes, and are characterized by splitting, chambering, and brecciation, making apparent that they were formed under relatively slight load, probably at no great depth below the surface.

"At the first locality examined, on the Ophir claim, there are two veins, nearly parallel in strike and about 4 feet apart, on the outcrop. These veins dip at different angles, and intersect about 6 feet below the surface. The maximum thickness of one vein is 16 inches and of the other 10 inches. From the thickest part both pinch rapidly in either direction, thinning to less than an inch in a distance of 25 feet. The vein-filling is a coarsely crystalline galena with pyrite and calcite, with included angular fragments of the greenstone. These are frequently partly replaced by galena. Both walls of the veins are sharply defined, very little of the ore mineral extending beyond the wall. Small specks of galena do, however, occur in the wall rock, but they are exceedingly rare. The veins were originally covered with 2 to 5 feet of gossan, composed of limonite and other oxidation products; but this gossan has been removed during the development work. Below this the galena is stained a rusty brown colour on the surface.

"About 75 feet upstream from this showing, another vein occurs on the Ophir claim. It is similar in many respects to those already described, but is thinner and much more sparingly mineralized.

"In addition to the veins, many of the joint planes of the dyke have galena and calcite deposited in them. These are interesting as showing how intense mineralization was in this vicinity, but owing to their size they cannot be considered of economic importance.

"Four samples were taken, all of them from the first locality described, which is considered as the most promising showing on the property. No. 50 is intended to represent the average of the larger vein at this locality; No. 51, the intersection of the two veins; No. 52, a sample cut at intervals along the smaller vein at the same place; and No. 53, a cut taken across the two veins, including the wall rock lying in between, to give an idea of the content per ton of material mined. These were assayed and the results are listed in the following table:—

No.	SILVER.		Lead per cent.
	Oz. per ton.	Value per ton.	
		\$	
50	73.60	73.60	50.11
51	105.00	105.00	63.36
52	30.08	30.08	20.64
53	29.96	29.96	18.62

"As may be seen from the above results, the deposits are of high grade and could doubtless be worked at a profit even under present conditions of trans-

## NEW WELLAND SHIP CANAL MEASUREMENTS

*Department Report Outlines  
Course and Dimensions of  
Locks.—Depth to be 30 ft.  
Eventually.*

### CONTRACTS ALREADY LET

The following report on the Welland Ship Canal is taken from the annual report of the Department of Railways and Canals:—

This important work has for its object greater and better accommodation for a larger class of vessels than those that can be used on the present Welland canal.

The present canal lies between Port Colborne, lake Erie, and Port Dalhousie, lake Ontario. Its length is 26½ miles, and comprises 25 lift locks, the dimensions of which are 270 feet by 45 feet, with a depth of 14 feet of water on the sills.

The proposed Welland Ship Canal as finally located follows the course of the present canal from Port Colborne, on lake Erie, to Alanburg, half-way across the peninsula. From this point an entirely new cutting is to be made, crossing the present canal just below lock No. 25, the water level of the two canals at this point being the same, viz., 568 feet above sea-level. The new canal again crosses the present one below lock No. 11, the water of both canals at this point being at an elevation of 382 feet above sea-level.

The proposed canal enters lake Ontario at the mouth of the Ten Mile creek about three miles east of Port Dalhousie. The total length of canal from lake to lake is 25 miles; and the difference in level between the two lakes, 325½ feet, is to be overcome by seven lift locks, each having a lift of 46½ feet. The dimensions of the locks are to be 800 feet in length by 80 feet in width in the clear and with 30 feet of water over the mitre sills at extreme low stages in the lakes. The width of the canal at the bottom will be 200 feet and, for the present, the canal reaches will be excavated to a depth of 25 feet only, but all structures will be sunk to the 30-foot depth, so that the canal can be deepened at any future date by dredging out the reaches.

A new western breakwater will be built at Port Colborne to ensure quiet water in the harbour during storms.

The outer entrance piers in lake Ontario will be placed about 1½ mile from shore, where the depth of water is 30 feet; a wide channel will be dredged out from these piers and an embankment formed on either side of it about 500 feet wide. The lock walls will be 82 feet high above the top of the gate sills.

The work is divided into nine sections, of which section No. 1, approxi-

portation and with hand methods of mining. Several hundred tons of ore could doubtless be extracted and hand-sorted for shipment, but as the veins are small and unlikely to prove persistent in depth no large tonnage is to be expected. Such ore-shoots, however, rarely, if ever, occur singly. The conditions are such as to warrant further exploration work in the hope of encountering other bodies, and it seems probable that in order to secure results such work should be confined to the dyke rock. There is no reason for supposing that the veins already discovered are the largest and best in the immediate vicinity, as they really were discovered as the result of a canyon having formed at this place. Trenches laying bare the surface of the dyke are consequently quite likely to disclose similar bodies."

mately 3 miles, at the lake Ontario end of the canal, was placed under contract on the 1st of August, 1913; section No. 2, approximately 4½ miles, was placed under contract on the 31st of December, 1913; section No. 3, approximately 2 miles, was placed under contract on the 4th of October, 1913; section No. 5 was placed under contract on the 22nd of December, 1913.

During the fiscal year 1917-18, the sum of \$1,235,046.59 was expended, making the total expenditure to March 31, 1918, \$14,928,969.58.

## METRIC SYSTEM OF WEIGHTS AND MEASURES

*Non-Metric Countries are  
Divided on Subject of  
Adoption.*

The following statement on the subject of the metric system of weights and measures is taken from the report of Mr. E. O. Way, Chief Inspector of Weights and Measures, as published in the annual report of the Assistant Deputy Minister of Inland Revenue, for the last fiscal year.

This subject is still in the forefront of discussion, the two great non-metric countries, England and the United States, being divided into two militant camps of "pros" and "antis."

There is no question but that great benefits would result did the whole world use but one system of weights and measures, but there is equally no question but that great disorganization, confusion, expense, inefficiency, and obstruction would result to Anglo-American production were the metric system to be compulsorily adopted.

In this connection I feel it would be wise to cite the decision of "The Committee on Commercial and Industrial Policy after the War," appointed by the British Government under the chairmanship of Lord Balfour of Bureleigh, which, after two years of work, has just reported. Quotations from the report follow:—

"This change has been strongly urged upon us from various quarters, but it cannot be said that there is any such general agreement of opinion in its favour among those who have studied the subject as would justify its adoption.

"... in view of the exceptional difficulties with which trade will be faced during the period immediately following the war, special weight must be attached to the consequences which are likely to arise during that period. In our opinion it is absolutely certain that the anticipated uniformity could not be obtained for a very long period, if ever.

"There is further the serious objection that if we induced the above-mentioned countries (non-metric) to change over to the metric system, we should be surrendered to Germany the advantages which our manufacturers now enjoy over here both in their markets and in our own, particularly as for some years to come we should have to manufacture on both systems, while Germany would be enabled to manufacture on one uniform system for the German market and nearly the whole of her export trade.

"We are not satisfied by any evidence which has been brought before us that trade has actually been lost to this country owing to the fact that the use of the metric system is not compulsory. . . . But to attempt to make the use of the system universal and obligatory in this country would cause great loss and confusion at a particularly inopportune moment for the sake of distant and doubtful advantages. We are convinced that, so far from assisting in the re-establishment of British Trade after the War, such a measure would seriously hamper it.

"Our weights and measures are capable of detailed improvements . . . but we are not convinced that the metric system is upon the whole even theoretically superior to the British system, and we are satisfied that the practical objections to the proposed change are such as decisively to outweigh any advantages which are claimed for it."

## HAS PUBLICLY BOUGHT SUPPLIES VALUED AT OVER 200 MILLIONS

War Purchasing Commission Issues Report which Shows Scope and Value of Work.

### FAIR DEALING

In the third report of the War Purchasing Committee, recently issued, the value and number of purchases is shown, as follows:—

#### VALUE AND NUMBER OF PURCHASES.

"The Commission has been in existence nearly four years, and during that time has supervised purchases and contracts aggregating upwards of two hundred million dollars. On page ix is given a summary showing approximately the value of purchases authorized by the Commission during the past year for the different departments of the Government, but, in addition to contracts included in the values shown, numerous contracts have been authorized for which the values are not shown, although all purchases are, of course, reported exactly in the Auditor General's report. These unknown amounts consist principally of supply contracts. For example, a contract will be given after tenders have been called for the supply of provisions, forage, etc., during a period of time. The Commission does not in its minutes record an estimate of the value of this contract, nor has the Commission thought it necessary to obtain a report from the department showing the total amount of money spent.

"In examining these figures it must be borne in mind that the past year has been abnormal. Some departments had reduced their purchasing to the smallest possible compass, whereas others, such as the Militia or Naval Service, had large purchases to make on account of the war.

"The number of purchases and the work involved may perhaps best be indicated by the number of sessions held, and of minutes which record the Commission's transactions:—

Year.	Sessions per year.
*1915-16 . . . . .	188
1916-17 . . . . .	227
1917-18 . . . . .	257
1918-19 . . . . .	290
Total . . . . .	962

\*May 6, 1915, to March 31, 1916; other years April 1 to March 31 following.

"For the year 1917-18 the minutes of the Commission numbered 7,464, while the minutes of the year 1918-19 have so far been 16,247.

"The increased amount of work during the past year indicated above is due to the fact that the Commission has had to deal with the purchases of all departments for all purposes in addition to those known as 'War Purchases.'"

#### DUTIES OF THE COMMISSION.

The War Purchasing Commission consists of three honorary members, and was formed in May, 1915, for the purpose of supervising purchases under the provisions of the War Appropriation Act. The largest part of the work has been in connection with purchases for the Canadian Expeditionary Force. In February, 1918, the Commission was authorized by Order in Council to take charge of all Government purchasing for all departments and for all purposes. The objects of the Commission are the saving of public money and the abolition of patronage.

#### BASIS OF PUBLIC PURCHASING.

"The mere obtaining of a fair and reasonable price does not of itself justify any particular purchase. The public demand that, as far as reasonably possible, every firm in the line of business concerned has the right to an opportunity of participating in public business; hence the necessity for the re-

peated calling of tenders. This is, in fact, the only feature which differentiates public from private purchasing. In private life purchases may be made from one individual or from one firm as long as it suits the purchaser; in public buying, however, opportunities must be given to all persons or firms in the line of business concerned, as stated in the report.

## ESTIMATED AREA SOWN TO CROPS IN DOMINION

[Continued from page 1.]

the areas are: Wheat—Manitoba, 2,913,199 acres; Saskatchewan, 8,879,000 acres; Alberta, 3,658,600 acres. Oats—Manitoba, 1,715,000 acres; Saskatchewan, 5,088,000 acres; Alberta, 2,811,000 acres. Barley—Manitoba, 1,082,000 acres; Saskatchewan, 643,000 acres; Alberta, 437,000 acres. Rye—Manitoba, 249,000 acres; Saskatchewan, 137,000 acres; Alberta, 50,000 acres.

#### UNITED STATES CROP.

The Crop Reporting Board of the United States Department of Agriculture states (June 9) that the total area sown to wheat for 1919 is 71,526,000 acres, as compared with 59,110,000 acres in 1918, an increase of 12,416,000 acres, or 21 per cent. The acreage of 1918 was 14,021,000 more than in 1917, a ratio of 31 per cent; so that within two years the wheat acreage of the United States has increased by 26,437,000 acres, or 58 per cent. The area sown to oats for 1919 is 42,365,000 acres, or 4.6 per cent less than last year; to barley, 8,899,000 acres, or 8.1 per cent less; to rye, 6,576,000 acres, or 4.8 per cent more; and to hay, 71,224,000 acres, equal to last year.

## PASSENGER TRAFFIC ON ELECTRIC RAILWAYS

### Nearly 500,000,000 Were Carried on Car Lines in 1918 Says Report.

The table below, taken from the report on Railway Statistics, issued by the Department of Railways and Canals, shows the passenger and freight traffic over the electric railways of Canada, during 1918, and the number of fare passengers carried in each year since 1900.

The number of fare passengers carried in 1918 was 487,365,456. Comparison cannot be made with preceding years owing to the omission of facts relating to the Montreal Tramways and several other units.

#### PASSENGER TRAFFIC.

1901 . . . . .	120,934,656
1902 . . . . .	137,681,402
1903 . . . . .	155,662,812
1904 . . . . .	181,689,998
1905 . . . . .	203,467,317
1906 . . . . .	237,665,074
1907 . . . . .	273,999,404
1908 . . . . .	299,099,309
1909 . . . . .	314,026,671
1910 . . . . .	360,964,876
1911 . . . . .	426,296,792
1912 . . . . .	488,865,682
1913 . . . . .	597,863,801
1914 . . . . .	614,709,819
1915 . . . . .	562,302,373
1916 . . . . .	580,094,167
1917 . . . . .	629,441,997
1918 . . . . .	487,365,456

The volume of freight hauled in 1918 was 2,497,530 tons as compared with 2,335,539 tons in 1917.

## MEASURES TAKEN TO REDUCE PERIL FROM CONTAMINATED MILK

Report Shows Steps Taken by Department of Agriculture to Improve Health of Dairy Herds.

### NEW REGULATIONS

The activity of the Contagious Diseases Division of the Department of Agriculture in efforts to prevent the spread of tuberculosis through the use of milk from tuberculous cows is shown by the account of the working of the new tuberculosis regulations, in the report of the Veterinary Director General on the health of animals for 1918, recently issued by the department.

The report on tuberculosis is, in part, as follows:—

#### MUNICIPAL TESTING.

After a year's experience in the working of the new tuberculosis regulations, it was decided to amend them in one or two respects with the object of extending their scope and making more liberal compensation for reactors. The regulations were, therefore, amended to permit them to apply to any city or town applying for federal aid. Formerly such aid was limited to cities and towns of a population of 5,000 or more. Compensation was raised to two-thirds the appraised value of the animal from one-third formerly, so that the owner of a reactor destroyed under these regulations may now receive a maximum of \$53.33 for a grade cow, or \$166.66 for a pure-bred registered one.

These changes have been very satisfactory to the dairymen, and have resulted in a wider extension of the work of control. Ottawa and North Battleford applied for federal aid and during the year the first test was applied to the herds supplying both these places. No unpleasant friction between owners and the department was observed, and a number of reactors were got rid of which had been regularly supplying milk to the citizens.

#### IMPORTANCE OF WORK.

The importance of this work to the health of a community can hardly be over-estimated, especially to the welfare of the child population. It was found by our tests that some herds were supplying milk to be consumed in the raw unpasteurized state, when almost every cow in the herd was diseased. This milk must have been highly dangerous for the children drinking it, yet the parents were probably quite satisfied if its appearance and taste were all right.

Experiments have proved that young pigs fed on tuberculous milk become tuberculous to the extent of 80 per cent if they receive only two or three feeds of it. When fed continuously on it for a month, 100 per cent became infected.

There is no reason to believe that children are not equally susceptible to the effect of consuming tuberculous milk. The results are not so evident as in the case of pigs, but far more disastrous to the human race. Much human tuberculous comes from drinking tuberculous milk, and every effort should be made to prevent it by putting the tuberculous cow out of business.

Urban municipalities might well give some consideration to this important health matter and protect the lives of the little ones by permitting only wholesome milk, free from tuberculosis, to be sold. The tuberculosis regulations show how easily and at how little cost to a town this may be done.

Since this work was begun there have been over seven hundred diseased cows removed from the dairies supplying four cities and towns. The evil potentialities of seven hundred diseased cows in spreading tuberculosis cannot be estimated. We can only be thankful that

their opportunity is gone, and hope that the evil they have done will not live after them.

Statistics on this work are difficult to compile. Dairymen seldom retain a cow more than a year or two. Sometimes it is the practice to sell a cow as soon as her period of lactation is finished, and to replace her with another which is just commencing or, in the parlance of the dairy, a "springer." This continual changing of cows makes the work of testing almost a continuous performance.

Cows to replace those sold out of the dairy, or condemned as reactors to the test, must be tested by our inspector before being added to a clean herd, and it is therefore found impracticable to test these herds, as we do breeding herds, by regular semi-annual tests. For the same reason, the figures of testing can never be completed, and we can only report the number tested to this date and the number of reactors found.

### For London Hospital.

Separate sealed tenders addressed to the undersigned, and endorsed "Tender for Isolation Hospital, Westminster Psychopathic Hospital, London," or "T. B. Pavilion, Westminster Psychopathic Hospital, London," etc., as the case may be, will be received until 12 o'clock noon, Friday, August 15, 1919, for the construction of an isolation hospital, T. B. pavilion, recreation building, storage, garage, etc., at Westminster Psychopathic Hospital, London, Ont.

Plans and specification can be seen and forms of tender obtained at the offices of the Chief Architect, Department of Public Works, Ottawa; the Superintendent of Construction, Westminster Military Hospital, London, Ont.; the Superintendent of Dominion Buildings, Postal Station "F," Toronto, Ont.; and the Overseer of Dominion Buildings, Montreal, P.Q.

Tenders will not be considered unless made on the forms supplied by the Department and in accordance with the conditions set forth therein.

Each tender must be accompanied by an accepted cheque on a chartered bank payable to the order of the Minister of Public Works, equal to 10 per cent of the amount of the tender. War Loan Bonds of the Dominion will also be accepted as security, or War Bonds and cheques if required to make up an odd amount.

By order.

R. C. DESROCHERS,

Secretary.

Department of Public Works,

### For Halifax Hospital.

Sealed tenders addressed to the undersigned, and endorsed "Tender for Alterations to Buildings, Camp Hill Military Hospital, Halifax, N.S.," will be received until 12 o'clock noon, Tuesday, August 12, 1919, for alterations to buildings, Camp Hill Military Hospital, Halifax, N.S.

Plans and specification can be seen and forms of tender obtained at the offices of the Chief Architect, Department of Public Works Ottawa; the Superintendent of Military Hospitals and the Superintendent of Dominion Buildings, Halifax; and of the Overseer of Dominion Buildings, Central Post Office, Montreal, P.Q.

Tenders will not be considered unless made on the forms supplied by the Department and in accordance with the conditions set forth therein.

Each tender must be accompanied by an accepted cheque on a chartered bank payable to the order of the Minister of Public Works, equal to 10 per cent of the amount of the tender. War Loan Bonds of the Dominion will also be accepted as security, or War Bonds and cheques if required to make up an odd amount.

By order.

R. C. DESROCHERS,

Secretary.

Department of Public Works,  
Ottawa, July 24, 1919.

### Government Railway Expenses

The total working expenses on the government-owned lines in 1916-17 was \$23,930,398.06, and in 1917, \$33,259,488.02, an increase of \$9,329,089.96, as stated in the annual report of the Department of Railways and Canals.