

Conservation

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Tar Sands of Alberta

THEIR USE FOR ROADWAYS

Entrance of Railways to the
District Will Hasten
Development

The existence of deposits of bituminous sands in the McMurray district of Northern Alberta has been known for many years. The absence of transportation facilities has, however, prevented the utilization and even the prospecting of these deposits.

Anticipating the building of the



Cut No. 85
Building Protecting Walls Around Trees.

Alberta and Great Waterways railway into Northern Alberta, a preliminary examination of the deposits was undertaken by the Dominion Mines Branch in 1913, and continued in 1914. Meanwhile, the construction of the railway, which will open up and render these deposits available, is being rushed, and its completion is expected in 1916.

The investigation revealed the fact that the tonnage of bituminous sands in the McMurray area is very large, and, although much of the material is low grade and, in some cases, the overburden so heavy that mining by open-cut is impracticable, it is found that some 20 per cent of the material, representing many millions of tons, may be considered as of commercial value.

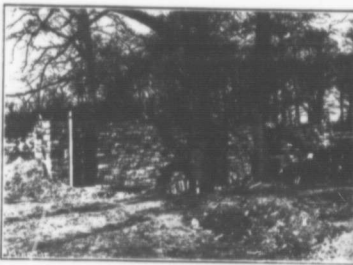
Bituminous sands have for a number of years been used in the

The Commercial Value of Forest Trees in Real Estate Development

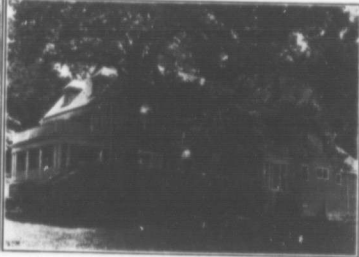
In the development of real estate in Canada, too little regard has been paid to the commercial value of trees and even great corporations have deliberately thrown this value away by clearing the ground before sub-dividing it.

In suburban development in the United States, not only are trees considered to be worth keeping, but it is found to be worth while to spend considerable sums of money in preserving them.

The Roland Park Estate at Baltimore is a successful commercial enterprise. The president of the Estate says he has found, after 20 years' experience, that it pays to keep the trees, even when it costs something to do so. The views herewith indicate what is done to preserve trees at Roland Park and the attractiveness they are to the Estate.



Cut No. 86 Building Archways over Tree Roots to preserve them.



Cut No. 87 Building Part of House Round a Tree.

construction of various classes of pavements in the United States. The extent to which the material has been used appears to have been largely determined by the freight rates. The greater portion of the bituminous sand used at the present time in California for paving purposes comes from the Santa Cruz quarries, and is, in many respects, similar to the Alberta material. The bitumen contained in the McMurray rock is, however, much softer. It is believed that, with proper manipulation, such as heating, and the addition of hardening flux, the penetration of the bitumen can be reduced to meet the requirements of standard specifications for its successful employment in the laying of pavements in substitution of imported asphalt.

In view of the fact that the bitumen contained in the tar sands of Alberta is softer than the bitumen of the California material, arrangements have been made by the Mines Branch for the laying of an experimental pavement in the city of Edmonton with the Alberta material, the city government having agreed to construct the concrete foundation. Upward of sixty tons of suitable material has been assembled for transportation to Edmonton, and it is expected that

(Continued on Page 6)

Industries and Cheap Power

Water Power Necessary in the Manufacture of Many of the Coarser Products

In investigating the relative requirements of the different industries which should thrive and which, therefore, should be encouraged in Canada, one may follow different lines of reasoning. One train of thought naturally makes us turn to the benefits to be derived from our large water-powers now still unused. Water-power means cheap power where large amounts and continuous operations are required. The industries in which the cost of power enters only to a small degree in the total cost of production do not benefit very greatly from cheap power. No doubt cheap power is a great attraction to all industries, but those requiring the largest amount, figured on a basis of the value of their product will naturally be attracted with greater force.

The following table has been prepared from both Canadian and United States census reports and various other sources. It shows the amount of power required, in the different industries enumerated, to produce \$1,000 worth of product during one year. The greater this proportion, the

greater attraction will cheap power have for this industry.

(Data from various sources)	
Nitrates from nitrogen of the air	31.4
Mechanical wood pulp	16.93
Aluminum	16.00
Calcium carbide	15.39
(Data from Canadian census)	
Cement	7.08
Log products	2.95
Brick, tile and pottery	2.28
Iron and steel products	1.98
Cottons	1.97

(Data from U.S. census)	
Cement	5.91
Paper and wood pulp	4.87
Kaolin and ground earth	4.47
Brick and tile	3.67
Grindstones	3.35
Iron and steel, blast furnaces	3.00
Flax and hemp, dressed	2.46
Lumber products	2.46
Cotton goods	2.07
Carborundum	5,150

h.p. hours to produce one ton. In the manufacture of nitric acid from the nitrogen of the air, one horse power is required for every 900 lbs. of acid produced in a year. The process of making graphite in electric furnaces also requires a large amount of power.

It is the business of armies to destroy. It is the business of Canadians to build up Canada by buying goods made in Canada by Canadians.

Canada's Fire Losses

More Stringent Building Laws, And Closer Inspection Required.

During 1914 Canada's total of fire losses showed a considerable reduction over 1913; yet it was in excess of that of 1912.

From an analysis of the causes of fires for 1914 some encouragement may be obtained in the belief that progress is being made in education along fire prevention lines. Carelessness has always been a prolific cause of fire loss, and a reduction of fires attributable to this cause from 183 in 1913 to 127 in 1914 is appreciated. Attention must still be directed, however, to the 30 losses caused by cigarette smoking and cigar and cigarette stubs carelessly thrown away.

One feature of the year's fire record which requires immediate attention is the large increase in the number of apartment house fires. No doubt part of this increase may be attributed to the proportionate growth in the number of apartment blocks being erected, but there is a serious danger arising in our cities from the number of one-family houses or old buildings which are being converted into apartment blocks, without corresponding protection from fire or of the lives of the inmates from fire danger. Stringent building laws should be provided covering this transformation process, and thorough inspection should be insisted upon both during the progress of reconstruction and at least annually by both the municipality and the insurance companies interested.

Too little attention is paid to the matter of building inspection, with the result that overheated pipes and heating apparatus is a common cause of fires. With proper inspection this could not be, as legal power is given to prosecute for maintaining dangerous fire conditions and all insurance policies are based upon the safe condition of heating and lighting equipment. It is a question whether fire insurance companies are not making it too easy for applicants to obtain insurance, and whether, as in the case of life insurance companies, thorough examination of the risk involved and the remedying of any dangerous or abnormal fire conditions should not be insisted upon before a fire insurance policy could be legally issued.

More attention should also be paid to the interior construction and heating of residential buildings. During 1914, no less than 750 dwellings were destroyed by fire, and of these a large proportion through forcing of the heating equipment.

During January 1915, no less than 66 fires were reported as caused by defective heating apparatus, 11 by defective wiring, and 19 from carelessness with matches.

The Value of Wood Waste

Experiments as to its Use in the Production of Ethyl Alcohol

The value of most of the wood waste produced to-day is limited to its fuel value for the production of power at the mill. In some cases, methods of closer utilization have been worked out, but, compared with the total amount of wood waste produced, the amount of material so utilized is almost negligible. Furthermore, most of the large lumber mills produce waste greatly in excess of the amount necessary for power production and the waste burners are still in use, involving not only a loss of large amounts of wood, but also a definite, fixed charge to get

Flowers and Weeds

Uncontrolled Flowers May Often Become Bad Weeds

The propagation of weeds has at times been encouraged under the guise of the planting of a beautiful flower. Instances of this are not rare in Canada, and among those may be mentioned that of the Kochia, or Burning Bush, an illustration of which appears herewith. This is an ornamental annual, of rapid growth to three feet high. The leaves are slender and of light green colour, changing in September to a deep red. The flowers are small but innumerable, and the seed proportionately plentiful.

The plant, if allowed to ripen, drops its seed very readily, and,

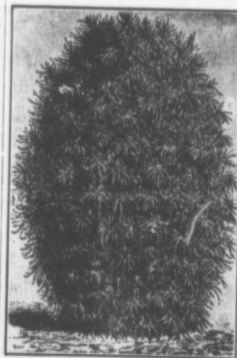
MORE THAN USUAL

The call is for more food What we want to understand is that it is millions of bushels, not millions of acres, that are called for; more milk and butter and cheese, rather than more cows. It is a day when the economized use of labor will tell Let us remember that it is more bushels per acre, more pounds of milk per cow, more pounds of meat per animal that will count, and that will mean more food per farm. Let us in 1915 make good on the farmer's fighting line with "MORE THAN USUAL."—C. C. James, at the 1915 Annual Meeting of the Commission of Conservation.

rid of it. It has been possible in the past to utilize only a small percentage of this material, but the problem is being attacked from a number of different angles and there is reason to believe that, within a short time, a much larger percentage of such material can be utilized at a profit. Laboratory experiments are being conducted by the United States Forest Products Laboratory, looking toward the commercial production of ethyl alcohol from the distillation of sawdust, shavings, edgings, etc.

A study of the motor fuel problem will show that the production of mineral fuels, such as gasoline, motor spirit, etc., is not keeping pace with automobile production. Alcohol appears to be the only solution of the problem, for, if it can be produced from wood waste at a reasonable figure, a tremendous supply of raw material is available from a natural, growing raw material which is not a food-stuff.

If the experiments now under way should demonstrate that the processes found practicable on a laboratory basis can be made commercially practicable as well, the result will be a tremendous advance in the practical utilization of forest products.—C.L.



Cut No. 88 Kochia or Burning Bush

wherever a seed drops, a plant will grow the following season. It has been largely used as a border plant along roadways and drives, and is sold by the seedsmen for this purpose. On account of its rapid spreading, the planting of Kochia should be discontinued and seedsmen would be well advised if they refrained from further selling it.

TAR SANDS OF ALBERTA

(Continued from Page 5)

the pavement will be laid next summer.

The City Commissioner states that: "if this work is successfully carried out it will be of greater value to the city of Edmonton and Alberta generally than the bringing in of half a dozen industries at the present time, we are absolutely suffering for the lack of cheap pavement and for the lack of good road material, whereby the farmers may haul their products to the city on well built roads. The solution of this problem will be worth millions of dollars"

At present, all asphaltic paving materials used in Canada are imported from foreign countries. In 1913-14 the value of these imports reached a total of nearly \$900,000 and the consumption is rapidly increasing. The value of a cheap and satisfactory paving material in Western Canada would be very great.

The bituminous sands may also serve as a source of pure bitumen, which may be extracted either by distillation of carbon, the lighter petroleum distillates, or by the use of hot water and steam. Among the many uses to which this extracted bitumen may be applied may be mentioned: floorings for many classes of buildings—such as mills, hospitals, schools, skating rinks—for foundations which require to absorb vibration and jars, as in electric power plants, for lining and damp courses for cellars, reservoirs, etc., for insulation of pipes, and as a source of asphaltic oils.

Attempts in this direction have been made for the past twenty years in the United States. No industry, however, has been established and no extracting plant is now in operation. The cause for the failures is not far to seek. In California extracted bitumen, at \$12.00 per ton, cannot compete with petroleum residuum at \$6.50 to \$9.00 per ton. In Alberta, however, bitumen extracted at \$12.00 would compete with imported refined asphalt, costing \$27.00 to \$34.00 per ton, delivered.

Before such an industry, however is attempted, all available information of the results of many years' serious and often costly experimentation in the United States should be consulted.—Dr. Haanel, at the Annual Meeting of the Commission of Conservation.

The workingman's wife can keep her husband on the pay-roll by buying goods made in Canada.

While the Canadian contingent is doing its part at the front and the Canadian business man is doing his part at home, it remains for the Canadian citizen also to do his part. It is patriotic and it is good business to buy goods, first, that are made in our own town, second, in our own country, and third, in our own British Empire.

Commission of Conservation

CANADA

SIR CLIFFORD SIMPSON
ChairmanJAMES WHITE
Assistant to Chairman and Deputy Head

CONSERVATION is published about the first of each month. Its object is the dissemination of information relative to the natural resources of Canada, their development and the proper conservation of the same, together with timely articles covering town-planning and public health.

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CONSERVATION is mailed free to those interested in the subjects covered by the work of the Commission.

OTTAWA, FEBRUARY, 1915

In time of war prepare for peace. This is Canada's duty at the present time.

The spreading of wood ashes upon land has beneficial effect upon the soil, the potash content being an excellent fertilizer.

The protection of the forest cover of the watersheds of Canadian waterways is so important as to affect the interests of every inhabitant of this country.

It is not too early to make plans for cultivating the vacant spaces and unoccupied land of our cities and towns. There will be need of all the produce that can be grown this year.

The terminal safety committee of the Intercolonial railway at Halifax, in their report of four months' operation, show that they have corrected 207 unsafe physical conditions and have warned against or corrected 73 unsafe practices. Safety work on the government railway is making rapid headway under an energetic safety engineer.

Exports of Canadian manufactures for the year 1913 were \$43,966,733. It is an axiom in manufacturing that the larger the output the less the proportionate cost. If Canadians, by purchasing made-in-Canada goods, enable Canada's manufacturers to increase their output to the extent of 50% of her imports, it would permit such a reduction in their manufacturing costs as to give them a greater opportunity of meeting competition in the markets of the world. This would again call for the employment of more Canadians and the further use of Canada's raw material.

GOOD ROADS

The campaign for good roads being carried on throughout Canada is only part of the general awakening of the people to the causes which have led to the enormous increase in the prices of the necessities of life. That the transportation problem is all-important for the farmer-producer is without question. That he may at all seasons reach his markets at a minimum of time and expense is a necessary factor in the making of reasonable prices for his products. For the consumer, good roads have an advantage in the fact that by enabling the farmers to reach the markets in greater numbers, the supplies of produce will be larger, and competition will be keener. A further consequence of this larger attendance will be that more attention will be paid to the condition of the produce offered by those displaying it for sale.

In the present campaign for increased production, good roads will play an important part. Motor transportation is being rapidly developed and utilized by the farmers. By this means greater distances can be covered and farmers at a considerable distance from markets, with the advent of better roads, will be able to bring their produce to the consumer in larger quantities and at less expense.

There are probably 10 boys and girls from 14 to 16 years of age, who, every year, enter some trade, such as manufacturing, agriculture, mining or transportation. Our present general scheme of education is not for these masses, but for the classes, and from every source of information we learn that the old apprentice has passed, so raw education must take its place.—Rhs D. Fairbairn, President, Ontario Technical Education Association, at 1915 Annual Meeting of Commission of Conservation.

INTENSIVE CULTIVATION—ITS RELATION TO THE FARM LABOUR PROBLEM

The development of a more intensive cultivation must carry with it a much more careful consideration of the labour problem. The difficulty of getting and keeping labour on the farm is a common place. I think farmers have not faced the fact that this difficulty is due in the main to their own way of doing their business. Competent men will not stay at farm labour unless it offers them continuous employment as part of a well-ordered business concern; and this is not possible unless with a greatly improved husbandry.

To-day agriculture has to compete in the labour market against other, and to many men more attractive, industries, and a marked elevation in the whole standard of life in the rural world is the best insurance of a better supply of good farm labour. Only an intensive system of farming can afford any large amount of

permanent employment at decent wages to the rural labourer, and only a good supply of competent labour can render intensive farming on any large scale practicable. But the intensive system of farming not only gives regular employment and good wages; it also fits the labourer of to-day—in a country where a man can strike out for himself—to be the successful farmer of to-morrow. Nor, in these days of impersonal industrial relations, should the fact be overlooked that under an intensive system of agriculture, we find still preserved the kindly personal relation between employer and employed which contributes both to the pleasantness of life and to economic progress and security.—Sir Horace Plunkett in *The Rural Life Problem of the United States*.

SAFETY LIGHTS

The use of matches and candles, etc., by repair men in making alterations or repairs in buildings is a dangerous practice. Numerous fires have been started by their use, and one of the most serious of recent fire losses is charged to the use of a candle to supply light while changing a gas meter. The gas pipe was broken, the gas caught fire from the lighted candle, and caused a loss to property of over \$150,000. For work of the above nature, the use of the storage battery electric lamp is strongly advocated. It is portable, the light is ample, and it is safe even amidst dangerous gases.

Fresh vs. Stale Fish

Fresh fish is an exceedingly perishable food product. Even when reasonable care has been taken by the packers and dealers, such fish will frequently deteriorate rapidly.

It has been scientifically demonstrated that the toxic or poisonous elements formed in decomposing fish, greatly exceed those produced in the flesh of warm-blooded animals. Further, these are usually most dangerous in the early stages of decomposition. Consequently the need for extra precautions in the selection of fresh fish is plain. The following points are worth remembering when purchasing fish.

- Dead fish are unfit for food:
- (1) When the eyes have lost their sheen and have become cloudy.
 - (2) When the red gills have become pale.
 - (3) When the flesh has become soft so as to pit if pressed with the finger.
 - (4) When the scales are easily loosened.
 - (5) When the fish will float on water.

Obviously all these tests cannot be applied to all fish that are offered for sale in the market stalls, but some of them can, and the householder would do well to apply them before purchasing fish.—A.D.

Production of Flax Fibre

Increased Growth and Improved Methods Required

The linen industry in Ireland and Scotland is in danger as a consequence of the war. Much of the raw material, flax fibre, has come from Belgium, France and Russia, and these sources of supply are, for the time being, closed. Representatives from the large mills of Great Britain have recently visited Canada in an endeavour to enlist the co-operation of farmers in a greater production of flax.

Here is an opportunity to develop the industry in this country, and by modern methods of production and handling, put it on a basis that will make it profitable under normal conditions and prices.

Flax for fibre can be grown in Canada wherever mixed farming can be carried on. In some parts of Quebec and in Western Ontario, from the days of early settlement, flax has been grown and home-made into linen. In only a few sections of Ontario in 1904 some 700 tons of fibre were produced, which sold for \$201 per ton. This fibre was of a poor commercial grade, owing to antiquated methods of preparation for spinning. A shipment to Belfast produced by slightly improved methods sold for \$240 per ton. The average price for Irish flax fibre during the last five years has been \$325 per ton, while Belgian flax has averaged \$405 per ton. It is obvious that Canadian flax should supply the present deficiency and future requirements of the Empire's raw material for linen production, and that more remunerative prices will be received if improved methods of production are employed.

The average acre of flax grown for fibre, under normal market conditions, and using the new process, would yield at least \$45.00 worth of fibre and seed worth \$13.00, making a total of \$58.00. This is about three times the usual export value of an acre of wheat. It will be three years at least before normal conditions can again be expected, and during this time higher prices are likely to prevail. The area in flax (mainly for seed) in Canada, in 1913, was 1,552,800 acres and, in 1914, 1,084,000 acres. This shows a decided decrease and it also shows that what is needed in Canada is a practical method of producing fibre.

Information regarding the growing of flax for seed and fibre purposes is contained in bulletin No. 59 of the Central Experimental Farm which can be had by applying to the Department of Agriculture, Ottawa.

Thoughtlessness is the cause of a great proportion of the accidents which result in the personal injury or death of employees.

Preservation of Mine Timbers

Treatment Necessary to Prolong Life Under Service

Timber in enormous quantities is used in mining operations in Canada and, owing to its high price in many localities, constitutes a large item of cost.

Ordinary mine timbers do not last in place for more than two or three years. To lessen the cost of replacement, and to conserve the supply, it is necessary to resort to some kind of timber treatment.

Timber used in mines is exposed to destruction from many sources. The relative importance of the different destructive agencies varies greatly with conditions with-

any of the above mentioned methods but, before the timber is treated, it should be peeled, seasoned and cut and framed to its final dimensions.

(a) *Brush treatment.* A cheap and effective treatment is to paint timber with two or three coats of hot creosote or some similar preservative. Care should be taken to get the preservative well into all checks, knot holes, and surface inequalities. The main disadvantage of this method is that the slight penetration is not enough to insure the protection of the interior of the timber for any considerable period.

(b) *Open tank treatment.* The timber is first immersed in a tank of suitable capacity containing the

DESCRIPTION OF MATERIAL	PREPARATION MADE	LIFE EXPECTED UNDER SERVICE (YEARS)	LIFE	
			PERCENT REPORTED	PERCENT IN-CREASING
UNPEELED				
PEELED				
SEASONED				
SEASONED & PEELED				
SEASONED & PEELED				
SEASONED & PEELED				
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cut No. 88

in the mines. The following shows this relative importance as observed in the United States:

Wear 5 per cent
Breakage and fire 20 per cent
Waste from all causes 25 per cent
Decay and insect attack 50 per cent

This shows that half the amount of timber is destroyed by decay and insects before it has given proper service. If this can be prevented at a reasonable cost, a considerable saving may be realized.

The following methods increase the life of mine timber.

- (1) Peeling
- (2) Seasoning
- (3) Preservative treatment

(a) Brush treatment

(b) Open tank treatment

(c) Pressure treatment.

PEELING. Peeling timber for use in dry workings may increase its life 10 or 15 per cent. Bark retards the loss of moisture from timber, and unpeeled wood therefore offers more favourable conditions for fungus growth than peeled timber.

SEASONING.—In dry, well ventilated workings, the life of seasoned timber is sometimes 25 per cent greater than that of green timber.

To insure thorough seasoning the peeled timbers should be piled with sufficient space between them to permit a free circulation of air throughout the pile. Too rapid seasoning, however, may result in checking, and so weaken the timber. Moreover, if left too long, decay is likely to develop. Summer-cut timber is more subject to deterioration than timber cut at other times of the year.

PRESERVATIVE TREATMENT.—Chemical preservative treatment of timber gives better results than

preservative and the charge heated to a sufficiently high temperature to drive off a portion of the air and moisture contained in the wood. Following this the timber is immersed in preservative at a lower temperature or left in the hot liquid and allowed to cool.

This method gives a better penetration of preservative than the open tank method.

(c) *Pressure treatment.* The essential difference between the open-tank process and the pressure process is that in the former atmospheric pressure is relied upon to secure the penetration of the wood, while in the latter the preservative is forced into the timber by artificial means. Owing chiefly to the difficulty of impregnating many species of wood by the open-tank process, the pressure treatments are the most widely used.

The diagram herewith gives the comparative life of treated and untreated loblolly pine gangway sets.—W. J. D.

Oil Burning Locomotives

Grand Trunk Pacific Will Use Them to Reduce Fire Risk on B.C. Division

The Grand Trunk Pacific railway has announced that contracts have been let and other arrangements made for the installation of crude oil as locomotive fuel on their passenger engines to be operated between Prince Rupert, B. C., and Jasper, Alta., a distance of 718 miles. It is expected that this installation will be complete by next June. The announcement does not cover the use of oil-burners on freight engines; it is understood that these will continue to use coal, at least for the present.

Farm Losses

WEEDS

During the past five years agricultural investigation work has been conducted along various lines by the Lands Committee of the Commission of Conservation. The weed question has received considerable attention and some facts have been revealed which show the real seriousness of this problem. Many of the worst weeds are getting ahead of the farmers and new methods of control are put into practice at once, the weeds will gain the upper hand.

In 1910, 100 farmers were visited in each of the Prairie Provinces and on 100 per cent of the Manitoba farms, wild oats were found. In Saskatchewan, 71 per cent and in Alberta, 3 per cent reported wild oats. In 1911 on the same farms in Alberta, 31 per cent reported wild oats while, in 1912, a still larger number reported this weed, showing that it was travelling westward rapidly.

The following table shows how some of the worst weeds are increasing. These figures are taken from the results of the Agricultural Survey of 1914:—

Weed	Manitota		Saskatchewan		Alberta	
	Per cent Reported	Per cent In-cresing	Per cent Reported	Per cent In-cresing	Per cent Reported	Per cent In-cresing
Ball Mustard	59	24	55	52	91	7
Canada Thistle	95	91	26	21	38	12
Sow Thistle	44	33	3	3		
Stinkweed	41	8	69	61	68	6
Wild Oats	95	80	59	56	83	13
	Nova Scotia		Prince Edward Island		New Brunswick	
Couch Grass	84	17	39	2	93	32
Ox-eye Daisy	92	14	73	24	93	21
Sow Thistle	3	1	34	18		
	Quebec		Ontario			
Couch Grass	96	82	53	12		
Ox-eye Daisy	69	51	34	7		
Sow Thistle	68	17	63	12		

This means that there is a great annual loss on Canadian farms due to weeds because:—

1. Weeds rob the soil of plant food and moisture thus increasing the effect of a drought by taking up the water and dissipating by evaporation the moisture which should go to the crop.

2. Weeds crowd out more useful plants, being harder as a rule and more prolific. As an example of this, alfalfa cannot do well where wild grass and weeds are mixed with it because the weeds will soon exterminate the alfalfa.

3. Weeds are a source of expense. From the time the farmer begins to fit his land for crop, these enemies increase the cost of every operation, of planting, harrowing, seeding, cultivating, cutting, binding, carrying and threshing, as well as of cleaning and marketing the produce. It takes more time to harvest a weedy crop. It costs

the farmer just as much per bushel to thresh useless weed seeds which go into the measure, as it does to thresh the grain. These are direct money losses.

4. The eradication of some of our worst weeds is very costly. It sometimes prevents farmers following the best crop rotations or may even compel him to grow a crop which is not profitable.

5. Many weeds are conspicuous and unsightly on farm lands. They thus depreciate the value of land.

6. Some weeds are poisonous to stock; others are injurious to animal products, as burrs in wool, and wild garlic and stinkweed, which taint milk. Some weeds, such as wild barley, cause irritation and painful wounds by penetrating the flesh, particularly the mouth parts.

7. Weeds attract injurious insects and harbour fungus diseases. Weedy stubbles and summer-fallows are breeding grounds for cut-worms and the rust of small grains may pass the winter on several kinds of grasses in a dirty stubble.

To overcome these losses or in a measure to curtail them, the following points should be observed:

1. Do not sow weed seeds; sow clean seed grain.

2. Do not allow new weeds to gain a foothold on the farm.

3. Prevent annuals from going to seed.

4. Practice a short rotation of crops including a sufficient amount of hoe crop to clean a good share of the farm each year.

5. Plough shallow immediately after haying and keep down all weed growth until autumn. Then plough again thoroughly and follow the next spring with a hoe crop. Gang plough shallow and work well just before planting.

6. Make use of smother crops such as heavy seedings of rape or buckwheat.—F. C. N.

Canada-made goods must always be good goods.

Safety in the home is as necessary as in the factory. Care can prevent accidents to the children as well as to the father.