

Conservation

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Forests not Growing as Rapidly as Cut

Governments and Lumber Interests
are Awakening to Need for Perpet-
uating Wood Industries

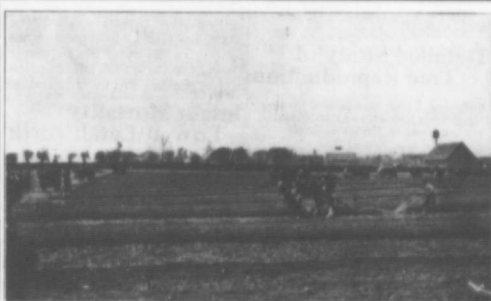
The forestry situation in Canada distinctly more favourable than in the United States, due to the great bulk of the forests being on Crown lands, and thus subject to such cutting regulations as may be prescribed by the governmental agencies concerned, either Dominion or provincial, as the case may be.

The fact remains, however, that due to a comparatively small extent of the existing cutting regulations provide to anything like an adequate degree for the perpetuation of the forest on cut-over lands. Studies made by the Commission of Conservation show, for example, that in the pulp-wood forests of eastern Canada, present methods of cutting are resulting in the steady deterioration of the forest, and are rapidly rendering great areas relatively unproductive.

The demands for export material are steadily increasing. Not only does the United States take around 40 per cent of the pulpwood produced in Canada, but there is an export business of wood-pulp and paper, to the United States, Great Britain, France, and other countries, aggregating over \$1,000,000 in 1917, and probably around \$35,000,000 in 1918. The exports of lumber add very handsomely to this total, and are becoming much greater through shipments to Great Britain and other European countries.

The value of Canadian forests, not only in maintaining home industries but in building up a great export business and thus under the balance of trade are so favourable, can scarcely be over-emphasized.

The necessity for recuperative measures, now found to be so urgently required in the United States, is rapidly becoming obvious in Eastern Canada, and merits the best consideration of the governmental agencies concerned. In addition to the investigations of the Commission of Conservation and the Dominion Forestry Branch, the Provincial Forest Service of Quebec and New Brunswick have the whole situation under very careful consideration.—L.



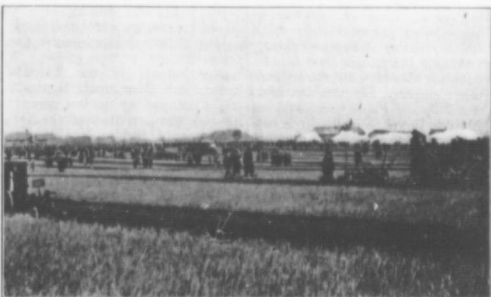
FARMER COMPETITORS SHOW THEIR SKILL IN PLOUGHING. Cut No. 194

PLOUGHING MATCH AND TRACTOR EXHIBIT

A very successful ploughing match and tractor exhibit was held at Ottawa on the 14th, 15th, and 16th October. In all 30 teams competed in the various classes and about 25 tractors gave practical demonstrations of their ploughing capabilities. There was also an equal number of various other kinds of farm motors, driving threshing machines, binders, milking machines, etc. A large crowd of farmers and other visitors was in attendance and a keen interest was shown in the various demonstrations.

The importance of better ploughing lies very largely in its reaction on other farm activities. It is in itself important, as ploughing is the chief operation in soil tillage. The farmer, who takes a pride in his ploughing, is likely to do all his other operations well, in order not to spoil the good job he has already done. Hence ploughing matches promote, not better ploughing merely, but better farming generally.

To intending purchasers of tractors, the practical demonstration of these machines would be of great importance. The exhibit at Ottawa provided a unique opportunity for farmers to see all the well-known makes in actual operation and thus select the one most suited to their special conditions.



MUCH INTEREST WAS TAKEN IN THE TRACTORS AT WORK. Cut No. 195

The above pictures show scenes from a ploughing match which was organized to stimulate production. But, in order that the farmer may have markets Great Britain must have credit, so BUY VICTORY BONDS.

Sole Antidote for High Living Costs

Increased Production is Sure, if
Gradual, Care for Present
Economic Distress

The high cost of living is the greatest material problem of our day.

For the man with a small income, it is a large-sized menace; even for the man with a comfortable income it is a source of continual worry.

The phenomenal rise in prices since 1914 is due to the scarcity of goods brought about by the suspension of production during the war. We have also wasted untold quantities of material for war purposes.

This shortage and this waste must be made good before the world can be again as prosperous as in 1914. Until they are made good, it is useless to expect that prices will materially decline or even remain stationary.

Recognising this fact, many people propose that we get over the difficulty by increasing wages, salaries and profits in the same ratio as the advance in prices. If this were possible, the effect would be the same as reducing prices to pre-war levels. Ultimately, this may take place, but certainly not soon.

The "day-light savers" realized that they could not get the public to perform every act of the day one hour earlier than usual, so they innocently deluded us by advancing the clock. It worked, because there was no fundamental law against it. But we cannot cheat ourselves over the cost of living in the same manner. Increasing wages without augmenting production sends up prices and leaves real wages unimproved.

What does the higher cost of living really mean? Sweeping aside the camouflage of prices expressed in currency, it means this: That we must now put forth greater effort and work harder to obtain the same satisfactions. There is no cure for it but economy and increased production.

It is not in the nature of the average human being to economize in what is lightly come by, nor to work any harder than is necessary to obtain a comfortable living.

Therefore, the high cost of living is not only natural, but necessary at the present time. Let us face this blunt truth bravely and apply ourselves patiently to work and to save—the only remedy.

School on Wheels to Teach Forestry

Canadian Forestry Association Sends Travelling Exhibit through the Prairie Provinces

During the month of November, a carload of information on forests and their products will visit many centres in the Prairie Provinces. For the past few months the car has visited the forested sections of Eastern Canada and attracted much interest and attention. The exhibits in the car were brought together and arranged by Mr. Robson Black of the Canadian Forestry Association. The car is the property of the Canadian Government Railways and will be moved from point to point over the lines of the several railway companies operating in the Western provinces and will be under the supervision of an official of the Dominion Forestry Branch.

The exhibits have been drawn from many different countries, including Canada, the United States, Great Britain, Germany, France, Scandinavia, Egypt and Japan. Lectures will be given by the men in charge of the car in the car itself and also in halls in the towns visited, where every phase of the timber industry, from the planting of seedlings to the manufacture of all manner of wood products, will be explained and as far as possible demonstrated. The car contains a miniature nursery of spruce and Scotch pine seedlings. Adjoining this is a model of a maple sugar bush in which both primitive and modern methods of sugar making are illustrated. The interest in this exhibit in the West may be necessarily academic, but every Canadian should know of the progress made in this important industry. Numerous sections of trees are provided to be used for indicating the facts that have been learned with respect to tree growth. There is also a remarkably comprehensive exhibit of wood products, ranging from the well known indurated fireware to excellent specimens of fibre silk. There are samples of underwear and other articles of clothing from the Scandinavian countries, Germany and Japan, surgical dressings and bandages made from Canadian spruce, heavy grain sacks from Britain and scores of other similar articles, each of which has been produced from wood pulp. Samples are shown of the products derived from the distillation of the half million cords of Canadian wood which are now used every year in the distilled wood industries. Specimens of wood injured by disease and insects are exhibited and form striking object lessons of the injury done by these enemies of the forest. Forming a central part of the exhibit is a field telephone and wireless set and a model of a lookout tower used in locating forest fires. Coloured transparencies and an automatic projector provided with electric lights, as well as graphs and charts are used to illustrate salient features in the Canadian timber industries.

The Canadian Forestry Association, the railway companies and the Dominion Forestry Branch are to be commended for bringing together an exhibit available for public inspection such a valuable collection of forestry exhibits.

The only cure for ignorance is education. Ignorance of the nature and extent of our forests, of the necessity for protecting them from destruction by fire, disease and reckless lumbering, and a general public apathy are the greatest forces opposed to the conservation of forests. Any and every agency that assists in overcoming these forces merits public commendation and support.—A.D.

Detailed Study of Tree Reproduction

Pulp and Paper Companies Co-operate with Government in Investigation of Forest Growth

The increased interest of pulp and paper companies in the condition of their timber limits is highly significant. The former opinion that the annual growth of valuable species would replace the annual cut on specific areas of cut-over lands is gradually giving way to the realization that, only too frequently, this is not the case. There is a growing realization that nature unaided may be wasteful in her methods, and that the assistance of man may be necessary to repair the damage caused by him in his industrial operations.

Pulp and paper companies do not hesitate to spend large sums on research in the laboratory, to determine the best processes of manufacture, but only recently has it been brought home to them that laboratory methods may also be of vital importance in the forest, to determine how best to produce adequate supplies of the raw forest material, upon which all the processes of manufacture are so vitally dependent. Obviously, even though planting may be undertaken on a large scale, as a number of pulp and paper companies are now doing, it will still be of the greatest importance, from both the public and private standpoints, to retain in a productive condition the great areas of cut-over or burned-over forest lands upon which planting is impracticable.

Among the companies which are adopting this view are the Laurentide Company, Limited, the Rioridon Pulp and Paper Company, the Abitibi Power and Paper Company, and the Bathurst Lumber Company. These companies, in co-operation with the provincial forest services of Quebec and New Brunswick, and with the Commission of Conservation, have inaugurated field studies to determine just what is taking place on their cut-over lands. The extent and character of the natural reproduction is being studied carefully, and, in a number of cases, experimental cuttings are being carried on, to test the results from various methods of exploitation. Cuttings are made, for example, to different diameter limits, and the results will be compared with clean-cutting, as to re-

production, rate of growth, damage by windfall, etc. The co-operation of the Dominion Entomological Branch has been secured, with a view to studying insect damage under the differing conditions.

Similarly, the Dominion Forestry Branch, in co-operation with the Militia Department, has under way a detailed study of forest conditions on the Petawawa Military Reservation, Ontario.

The greatest obstacle to intelligent forestry practice in the past has been that too little has been known of the forest conditions, with the result that the basis for an advanced forest policy has been inadequate. Investigations of the character outlined give great promise for the future of the forests of the country, and their continuation and expansion are most desirable.

Infant Mortality Low at Letchworth

Pioneer Garden City has Death Rate Less than Third that of Toronto

Fifteen years ago, a group of reformers built a new town on garden city principles, thirty-four miles from London, to prove, among other things, that a more of town and country life was possible and practicable and that, as a result, there would be healthy children and the rate of infant mortality would be reduced.

The time of proof has come. "It is an interesting fact to record," says the *Garden Cities and Town Planning Magazine*, that, during the eventful and difficult year of 1918, the infant mortality rate in Letchworth was 30 per thousand births. This is the lowest figure it has ever reached (in 1917 it was 36) and is by no means due to a low birth rate."

A garden city is not a mere residential community. Herein it differs from the garden suburb. It is intended to be "a small town, organized for modern industry, of a size that makes possible a full measure of social life, surrounded by a permanent belt of rural land." It does not aim to be a bigger, but rather a better, town, where the normal activities of life shall have the best chance of expression.

Dr. Helen MacMurely recently stated that every year in Ontario nearly 10,000 children under the age of five go to their graves. A recent bulletin of the Toronto Bureau of Municipal Research states that during the last decade, through the activities of the Department of Public Health, the infant mortality of Toronto has been reduced from 182 per thousand in 1909 to 103 in 1918. The general rate for the whole of Canada was recently given as 140 per thousand; for Great Britain, 139; for Sweden, 96; for Norway, 86; for New Zealand, 76.

Considering the many factors that contribute to the destruction of child life, the fact that only 30 children out of every thousand failed to survive at Letchworth, during the year 1918, cannot fail to carry conviction of the soundness of town-planning principles to any fair-minded observer.—A.B.

Winter Storage of Potatoes and Roots

Factors in Successful Keeping of Vegetables in Cellars

Conservation of food supplies has always been an important problem in climates such as ours, but is especially so in these days of high prices. After devoting care and labour during the summer to the raising of vegetable produce, it is only good business to give equal attention to the proper storage of it.

The main factors in successful storage are temperature, ventilation and humidity. The ideal temperature for tubers and roots is 35° Fahr. It should never be allowed to fall below 32° and should be kept as uniform as possible. A thermometer should always be kept in the storage room and the temperature constantly observed.

Good ventilation is essential because it prevents heating and excessive dampness and therefore checks sprouting, decay and the growth of moulds. The roots may be piled on a false floor of slats and may be kept away from the walls in a similar manner. Large piles may have wooden pipes placed upright in the pile at convenient intervals. Such pipes can be very simply made by nailing three boards together so as to form a tube with a triangular section.

The humidity of a good storage room should not be high, but absolute dryness is not desirable, as this would lead to a serious shrinkage and deterioration in flavour and quality. Onions, however, require a drier temperature than most other roots. If there is a furnace in the cellar, the portion devoted to root storage should be partitioned off. Excessive dryness may also be prevented by a covering of slightly moist sand. It may be necessary to sprinkle this occasionally with water. On the other hand, if there is too much dampness, it is a sign that the ventilation is deficient.

It is very important that the produce be in good condition before being stored. It should be dry and untouched by frost and reasonably free from adhering soil. Potatoes and roots should be dug on a fine day, if at all possible, and left on the ground for a short time only, before being brought in. Beet tops should be twisted off, not cut with a knife.

During the storage period, an examination should be made from time to time for decayed specimens and these should be immediately removed. In the spring, the sprouts of potatoes should be broken off unless required for seed.

PLAYING WITH MATCHES

During September four children were burned to death, each as a result of playing with matches. Regrets are of no avail. Children are fascinated by fire, and unless matches are kept where children cannot get at them, many more tragic deaths will occur. These were other people's children; yours may be next.

**Commission of Conservation
CANADA**

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CONSERVATION is published monthly. Its object is the dissemination of information relative to the natural resources of Canada, their development and proper conservation, and the publication of instructive articles on town-planning and public health.

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OTTAWA, NOVEMBER, 1919

WORKMEN'S COMPENSATION

The report of the Ontario Workmen's Compensation Board for 1918, the fourth year of its operations, shows the magnitude of the task with which it is charged. During 1918 there were 47,848 accidents were reported to the Board and over \$3,500,000 was awarded in compensation to the victims. These totals alone remove any doubt as to the essential service performed by a proper system of workmen's compensation. With an average of 158 accidents being reported each day in Ontario, and daily awards of compensation amounting to \$11,600, there must be adequate machinery and equitable methods to collect and distribute the funds necessary to cover this industrial and community loss. A progressive compensation system must go farther; it must take effective steps to reduce the number and cost of accidents to a minimum. The Ontario law gives the Workmen's Compensation Board power to promote accident prevention and, if more attention were devoted to this phase of the work, the annual compensation cost would show a marked decline.

FIRE FIGHTING OR PREVENTION?

Except London, Paris and Berlin, European cities have paid little attention to modern fire protective equipment. The fire directed their chief energies to fire prevention. Municipal expenditures have been devoted to the control of building construction and maintenance. On the contrary, Canada has developed very elaborate and efficient fire-fighting facilities. As regards appliances, methods and personnel, the fire brigades of large Canadian and American cities are incomparably superior to those of other countries. In this course of action lies one of the essential differences between the respective policies of Canadian municipalities and those of Europe. To prevent rather than to extinguish fires has not impressed public bodies in Canada as being a part of their functions. Consequently, the annual maintenance average costs of city fire departments average \$1.43 per capita, and insurance rates \$1.18 per capita in Canada as compared with 21 cents, 71 cents and 26 cents, respectively, in Europe.—*Fire Waste in Canada, J. Grove Smith.*

PAMPHLET ON COAL ECONOMY

Canadian consumers are always under a special necessity to exercise the utmost economy in the use of coal.

Central Canada is to a very large extent dependent upon the United States for its coal supply and a recurrence of the severe winter of 1917-18 will create a heavy demand for fuel, with the possibility of another failure of the railways to deliver the coal.

Canada has the reputation of being a wasteful nation. As regards our use of coal this reputation is deserved. The condition of the ashes removed from the average home by garbage collectors clearly shows that much good fuel is going to the dump heap. This is the result either of indifference in the operation of the furnace or of neglect to screen the ashes.

The Fuel Testing Branch of the Department of Mines, has recently published a pamphlet by John Bliard, B.Sc., on *Economic Use of Coal for Steam-Raising and House-Heating*, which gives valuable information on the operation of furnaces and on fuel economy.

A further and important reason for economy in the use of imported coal is that in the United States to-day our money is at a discount. Any substantial reduction in imports is of material aid in correcting the conditions to which the adverse exchange is due.

PREPARE THE ICE HOUSE

"We have ice cream every Sunday, and we have lots of it, which is probably more than the average city family has."

This statement was made by a farmer, whose family, though grown up, has not deserted farm life. The inducements which cause many young folks to migrate to the urban centres are counteracted by the comforts of the farm home.

The above remark refers to one of the incidentals, which, individually, seem insignificant but, collectively, mean much.

With ice so easy to secure, and the expense of packing so small, the wonder is that so few farmers put up a summer supply. Almost any kind of a building or lean-to will serve as a storage place. All that is necessary is good drainage and solid packing with sawdust.

The comforts that accrue to those having an ice supply are numerous, apart from its utility in providing cold storage for milk, butter, fresh meats, etc. The cost of the supply is nominal, and the labour is required at a time when other work is not heavy on the farm.

SOMEBODY WAS CARELESS

A gasoline lamp in use in a creamery at Moose Horn, Manitoba, exploded, and half the village was wiped out by fire, causing a loss of \$100,000. Gasoline lamps are a serious fire hazard when they are not kept thoroughly clean. The cleanliness depends upon the carefulness of the human element and no one can afford to invite a fire by lack of care.

PROSECUTION OF LAW BREAKERS

During the month of August, 1919, the Division of Fish and Game of the New York State Conservation Commission took action in 345 cases of infraction of the fish and game laws. Of these, 288 cases were settled in civil action or by fines; 46 licenses were cancelled and, in nine cases, suspended sentences were granted. In only one case was there an acquittal and the remaining four cases were either held for investigation or cancelled. The total amount recovered in fines or in civil action was \$5,038.35. The administrative branch of the New York Conservation Commission obviously is determined to make infractions of the fish and game laws in New York state a costly procedure.

CONSERVATION STUDIES AT CORNELL

A course in "Wild Life Conservation and Game Farming" has been added to the curriculum of the New York State College of Agriculture, one of the eight colleges of Cornell University. The course is intended to afford opportunity for those who look forward to taking positions as managers of game preserves, technical assistants to state game and fish commissions, secretaries of sportsmen's clubs and Audubon societies or assistants to state ornithologists and to those who hope to find employment with the United States Biological Survey and the Bureau of Fisheries to engage at work in zoological gardens and public parks that make a specialty of wild life." It is intended merely to supplement the training given in the courses leading to the degree of B.Sc. in agriculture and embraces both classroom and general lectures, as well as extra field work. The undertaking of such work by such an outstanding institution is significant and may overshadow similar action by other universities, especially those with strong agricultural faculties.

CLEAN THE FURNACE—SOOT WASTES HEAT

Soot has an important bearing on the conservation of heat. While much has been said and written regarding the necessity for economy of fuel, this question of soot, equally important from the household's standpoint, has been rather overlooked. Since the coal supply is limited, it is absolutely essential that the maximum quantity of heat obtainable from the fuel be utilised. An examination of many heating systems shows that considerable quantities of soot have been permitted to remain deposited on the interior surfaces of hot-water furnaces, preventing the heated gases from the fire-pot from accomplishing their duty of imparting the ultimate amount of heat energy to raise the temperature of the water in the boiler. The seriousness of this loss is demonstrated by the accompanying table.—*G.H.F.*

**Seasonable Lessons
from Forest Fires**

Legislation to be Effective Must be Elastic and be Backed by Enlightened Public Opinion

Every year, forests worth immense sums are sacrificed as burnt offerings to the Canadian god of carelessness and public indifference. The reckless camper and sportsman have caused the destruction of timber valued at many millions of dollars. Fortunately, public opinion has gradually crystallized into demanding and supporting legislation that may, in time, largely eliminate this class of citizen. But legislation of itself will never protect the forests completely and, unless it is made sufficiently elastic, may actually legalize careless methods in the woods.

During recent years this latter fact has been clearly demonstrated in British Columbia. Until this year, settlers were forbidden to burn their clearing slash until after September 15th in any year, unless granted a permit by the Forestry Branch. After that date, such burning was permitted by law, whether the season was a dry one or not. The result has been that some of the worst fires have occurred in that Province during the last two weeks of September. Although an Act to amend the Forest Act was passed last March, extending this time to October 1st, the season just closed presents a striking illustration of the danger of arbitrarily fixing a date after which it is legal to set fires in the forest. Following a long period of dry weather, a score or more settlers' fires, fanned by high winds, developed into widespread conflagrations. Sections of the forests in the Fraser and Cheakamus valleys and in some of the coast areas suffered heavily. Railways were seriously injured in places, homes were endangered or destroyed and several lives were reported to have been lost. It is possible that the settlers who started these fires were ignorant of the terms of the new Act or, knowing them, they chose to flout them and follow the practice of former years. In any case, the fires occurred at the end of September.

Moreover, any legislation to be effective must have the support of a determined and enlightened public opinion which will make it impossible for careless and selfish settlers, or others, to break it. Surely this country ought to be old enough and sufficiently schooled to stop playing with fire either in the forests or elsewhere. The folly and wantonness of burning the nation's resources has been demonstrated scores of times in practically every portion of the Dominion, so that only a mentally lazy people could fail to see and to feel the shame of it.—*A.D.*

Loss in Conductivity of Boiler Plate Due to Difference in Thickness of Soot

Thickness of Soot	Loss per cent
Clean	0.0
1/32-inch	9.5
1/16-inch	26.2
1/8-inch	45.2
3/16-inch	69.0

Advantages of Use of Pulverized Fuel

New Bulletin Issued by Commission of Conservation Gives Valuable Information for Consumers

The Commission of Conservation has just issued a report on *Pulverized Fuel: its Use and Possibilities*, by W. J. Dick, M.Sc., which may be had on request by those interested in economy of fuel for power and large heating plants. One of the pressing problems of industry in Canada is that of fuel supply. This is especially the case in manufacturing processes requiring heat. The rising costs of coal and the difficulty of transportation have proved handicaps of considerable importance, and are rapidly becoming accentuated. This situation demands that all the available heat contained in the coal be made use of. In the utilization of run-of-mine coal a large proportion is lost in the form of cinders and clinkers. To overcome this waste, a process for using coal in pulverized form is now in successful use.

Under this process, the coal is first dried, to reduce the moisture content to approximately 1 per cent. It must then be thoroughly ground, until 95 per cent will pass through a 100-mesh screen and 85 per cent through a 200-mesh screen. The coal is then transferred, usually by screw conveyors, to the furnace supply, whence it is blown into the fire-box by means of compressed air. Consumed in this way the coal burns like a gas and the flame has the characteristics and appearance of a gas flame. Results of tests have shown that there is no formation of slag in the furnace or on the tubes, there is no shower of cinders or ashes emitted from the smoke-stack and there is no damage done the boilers from heavy overload conditions.

Canada is particularly interested in the use of pulverized coal. At the pit-head and underground, at the mines in Nova Scotia and British Columbia, are great piles of unmarketable coal, dust and slack, while, in Alberta and Saskatchewan, there are immense reserves of lignite, which is high in moisture content. This lignite rapidly disintegrates on evaporation of the moisture and, consequently, will not stand transportation. It is also unsuitable for locomotive fuel on account of its liability to start fires from excessive sparking. But these coals, by drying and pulverizing, make excellent fuels for either heating or power-development purposes. They are lower in price, less expensive to handle and give greater heating value. The Dominion Coal Co., New Waterford, N.S., the International Nickel Co., at Copper Cliff, Ont., the British Columbia Sugar Refining Co., at Vancouver, and with one exception, all the cement companies are using pulverized coal with very satisfactory results.

To re-establish the returned soldier, to discharge Canada's debt to the wounded, to finance our trade during the reconstruction period, to stimulate our production of raw materials and manufactured goods, to put your dollars to work where they will benefit yourself and your country.

Preventing Damage to Logs in Storage

Various Methods Recommended for Minimizing Loss through Deterioration

Logs stored on skidways or left in the woods during the summer months may be damaged in a number of ways, principally through sap-staining, insect attack, decay, and checking. Certain species of wood are more susceptible to injury than others, and the extent of the injury is also dependent upon the time of cutting, the climate, and the storage conditions. The possible financial loss and amount which can profitably be expended to prevent it will be influenced by the value of the logs, the purposes for which they are to be used, and the probable extent of the injury. Where conditions permit, one or more of the following methods may be found useful in minimizing the loss.

Storing under water will prevent "blue stain," checking, insect attack, and decay, except that logs in sea-water, where marine borers are active, would be subject to attack by these pests. Wood of any species completely submerged in water will resist decay indefinitely. Alternate wetting and drying, however, favour decay.

Storing on skids in such a way that the air can circulate freely around each log will prevent the accumulation of moisture and thus retard decay. Such storing, however, is liable to increase checking and, unless the bark is removed, will have little effect in preventing insect attack. The skids should be located where there is good air circulation, and they should be raised off the ground. Weeds and brush should be cut down.

Peeling the bark completely from the logs will do much to eliminate insect attack and retard decay, by removing the protection required by many insects, and by allowing the logs to dry more rapidly. It will favour checking, however.

Painting the ends of the logs with paints of the proper kind will very materially retard the loss of moisture and thus retard end checking. If the logs are peeled and properly piled on skids, painting should not increase the danger from decay or sap stain. A yellow ochre or barn paint will do fairly well for this purpose.

Painting the peeled surfaces with coal-tar creosote will be useful in preventing sap decay, and if applied soon enough may be effective in retarding sap stain. Any grade of creosote in common use for wood preservation is suitable, and expensive oils are unnecessary.

All the methods described, except water storage, may be employed at the same time and to good advantage if circumstances justify the expense.—*U.S. Forest Service.*

Rat Extermination is Serious Problem

Concerted Crusade should be Undertaken to Reduce Ravages of Prolific Pest

The rat is always a pest and often a disease carrier. We know he is the cause of the spread of bubonic plague and possibly of other diseases.

The damage done by this rodent is enormous. As to the extent, we have no definite information, but certainly it amounts to hundreds of thousands of dollars! The progeny of one pair of rats in a season is estimated at 880, and, allowing for the death of at least one-half of the young, the number killed each year does not by any means offset the normal increase of the rat population. The Medical Officer of Health for Liverpool, Eng., reports that 13,868 rats were caught in that city during the year 1914, while it is estimated that the number of rats there is at least 1,000,000.

But this pest does not confine its ravages to the city; every farmer throughout this country suffers annually considerable loss. The damage in England is estimated at \$200,000,000. One authority estimates the loss to farmers alone in that country at \$75,000 per day. In the United States, the total damage has been estimated at \$180,000,000 annually.

To destroy this pest, various methods are in use and even official rat catchers are employed, but, so far, the rodent continues to work destruction in increasing proportions.

It should be the endeavour of each householder to remove all the accumulations of debris both without and within his premises and, at the same time, to rat-proof the buildings—the house, the barn, the warehouse and granaries—thereby making it impossible for the rat to obtain food. Then, having excluded him, he may be attacked in the open.

Another danger point is the entrance from sewers. Therefore cover all cellar drain pipes by which rats can gain access to the house.

The following rules to reduce the number of rats can be followed out by every householder:

1. All food receptacles should be rat-proof. Use covered metal garbage cans only.
2. Do away with the breeding places by abolishing plank yards and passageways and stables, which are excellent runways.
3. Keep rats out of the house and buildings and stables by rat-proof construction and well-screened basement openings.
4. Kill the rat at every opportunity.
5. Demand that local health authorities adopt local by-laws which will prevent your careless neighbour continuing to feed and help the pest to breed.—*C. A. H.*

Widening the Radius for Electric Power

Transmission over Distances Exceeding 200 Miles is Possible at High Potentials

Recent achievements are increasing the distances of economical transmission of electric energy. In long distance transmission of electricity, high pressures or voltages are required—the higher the voltage, the lower the losses. For several years after long-distance transmission had been introduced, it was the practice to allow a pressure of approximately 1,000 volts per mile. It was found, however, particularly with distances of over 100 miles, that the distance allowed could be increased to as much as two miles per 1,000 volts. In other words, lines operating at about 100,000 volts pressure have been transmitting energy over distances exceeding 200 miles. More recently, lines operating at 150,000 volts have demonstrated their practicability; one of these has been in successful operation for over five years.

Now, electrical engineers are of the opinion that pressures of 220,000 volts are quite feasible and it is stated that "the handling of electrical potentials of 220,000 volts does not appear to involve any disturbing complications or uncertainties. In fact, the manufacturers do not recognize that any serious problem exists. Current design principles and materials now in ordinary use will be employed, the principal difference from present high voltage equipment being the greater amounts of insulation and the larger clearances required. The step to 220,000 is relatively no greater than that previously taken from 66,000 volts to 110,000 volts or from 110,000 volts to 150,000 volts. Certain of the manufacturers have already developed designs, and assert readiness to undertake the commercial production of 220,000 volt equipment on short notice."

The advantages of long distance transmission are of particular interest to Canada, where much of our water-power is found in large units and, to reach many consumers, it may be necessary to transmit the energy for a considerable distance. It is perhaps of greatest interest in connection with our abundant water-powers in the river St. Lawrence and in the area lying to the north of the settled regions of the Prairie Provinces. It brings us closer to the possibility of making these vast stores of energy available within the settled portions.

In Saskatchewan, for instance, the power sites of the Churchill river are only some 250 miles from Saskatoon and 350 miles from Regina. The transmission of energy over these distances would be quite feasible at 220,000 volts, and economically possible when the demand of the entire district reaches a high enough figure.

TO CLEAN UP THE JOB—BUY VICTORY BONDS.