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No. 152. Thurs. Mar. 1, 1945 -- What Wartime Gardens Produced

There were 226,000 wartime gardens cultivated in urban centres with a population of 1,000 or more throughout Canada in 1944, which was 16,800 more than in 1943, according to the Agriculture Department. Approximately 121 million pounds or 60,500 tons of vegetables were produced from the 226,000 gardens. The estimated production per garden in 1944 was 535 pounds or about 15 pounds per garden less than in 1943.

The compilation was based on a survey made by the Economics Division, Dominion Department of Agriculture, for the Agricultural Supplies Board. The survey was made in the following cities and towns: Moncton, N.B.; Waterloo, Que.; Cornwall, Kitchener, Waterloo and Smith's Falls, Ont.; Regina, Sask.; Calgary and Medicine Hat, Alta. Volunteer workers of the Women's Voluntary Services, of the Department of National War Services, interviewed 1,141 representative householders who had wartime gardens to obtain the basic information for the survey.

Of the total amount of vegetables grown in wartime gardens last year 39 per cent were potatoes; 10 per cent, tomatoes; 9 per cent, carrots; 7 per cent, beets and turnips; cabbage and onions accounted for about 4 per cent each, the remainder was made up of a variety of other kinds of vegetables.

The average quantity of potatoes grown per garden was about 211 pounds or about 3½ bushels; 56 pounds of tomatoes; 48 carrots; 37 beets; and 23 cabbages. Twenty-nine different kinds of vegetables were grown. Eighty-eight per cent of the wartime gardeners grew carrots; 87 per cent, grew tomatoes; 86, grew beets; 81 per cent, beans; 74 per cent, onions; 65 per cent, lettuce. In order of declining popularity came cucumbers, peas, potatoes and radishes. All other vegetables were grown in less than 50 per cent of the gardens.

If the volume of vegetables grown in wartime gardens last year had to be transported by rail it would have taken about 2,016 freight cars loaded to 60,000 lb. capacity, or about 28 freight trains of 75 cars per train. The 226,000 wartime gardens do not include the many thousands of gardens that were cultivated in villages and on farms.

The Agriculture Department urges a continuance this year of wartime gardens with particular regard for even higher quality, rather than an increase in numbers. Food produced in wartime gardens will help to relieve the transportation problem, which is now rather acute and is likely to continue to be so for some time to come, states the Department.

No. 153. Fri. Mar. 2, 1945 -- Wonders of Plastic Surgery

Canadian servicemen who have suffered facial wounds, head injuries and burns so terrible that had they fought in the Great War they must have died, or at best survived to live out a lonely, desperate sort of existence, are today - thanks to the almost incredible progress of plastic surgery - being returned to civilian life so repaired and healed that in most cases a stranger would be hard put to guess the nature of their original wounds. So seemingly impossible to the layman's mind are some of the things being done by Canadian plastic surgeons, that even with the evidence before him, the round-eyed visitor is frequently tempted to pinch himself.

Behind this miracle of human salvage lies a chain of surgery which begins on the battle fronts and reaches its climax under the skilled fingers of Canadian

plastic surgeons working in the superbly equipped operating theatres of Canada's Joint Services Special Treatment Centres, the first and largest of which was opened over a year ago at Christie Street Hospital, Toronto. Since then, two other Centres have gone into operation, one at Montreal Military Hospital, and another at Shaughnessy Hospital, Vancouver.

In setting up such Special Treatment Centres, to which are routed all sailors, soldiers, airmen and men of the merchant marine in need of plastic surgery, the purpose was two-fold. First, it has made it possible to gather together at these three key hospitals, selected teams of the finest plastic, neurological and orthopaedic surgeons in Canada, drawn not only from the three armed services, but from civilian sources as well.

Secondly, it has made it possible to concentrate all the available, highly specialized equipment used in such fields of surgery at three hospitals, instead of having to spread it out thinly among hospitals all over the Dominion. This unique concentration of surgical skill and equipment has given the Canadian serviceman in need of plastic surgery, facilities second to none in the world.

From surgical units in France and Italy, and from the sick bays of Canadian ships of war, wounded servicemen requiring plastic surgery are sent first to the Canadian Army's big neurological and plastic surgery hospital at Basingstoke, England, now rated as the most modern and efficient plastic surgery centre in all of Great Britain.

At this great hospital a weeding-out process takes place. Servicemen whose injuries are comparatively slight are given treatment on the spot and returned to active duty as soon as possible. Those whose wounds preclude continued service and are of such a nature that a major operation in plastic surgery will be necessary before they can be returned to civil life, are given initial treatment at Basingstoke and as soon as they have been nursed back to health are sent on to Canada.

On arrival, if their condition permits, they are taken to their military districts, given 30 days leave and sent home. At the end of this time they report to one of the Special Treatment Centres and the exacting work of the plastic surgeon begins. Servicemen whose condition is so incapacitating as to demand immediate attention or who are so mutilated that they prefer to postpone visiting home and friends until they "look better", are sent immediately to the plastic surgery unit of whichever Centre is most convenient.

No. 154. Sat. Mar. 3, 1945 — Cold Storage in Relation to the Export Trade

In these days of war, ships are not always available to transport foods to other countries, or the ships that are available are stowed with commodities of more urgent war use. It is then that cold storage facilities come into great demand, whether these facilities be freezing space or cooling rooms. The concentration of perishable goods in cold storage warehouses has, at times, taxed the capacity of these establishments to the limit, so much so that there was great competition for space and some products had to give way to more important foods.

The Dominion Department of Agriculture's "Directory of Cold Storage Warehouses in Canada" shows the total capacity of refrigerated space as 63.1 million cubic feet. This total, however, is the over-all capacity. The piling capacity is less as allowance has to be made for alleys between piles to give stowing accessibility and for cold air currents. Pipes, posts, air ducts and wall footings

all have to be allowed for. Of the total capacity given above 22.7 million cubic feet are held at temperatures of 30° F. and under, while 40.4 million cubic feet are held at temperatures above 30° F. The chambers held at these two ranges of temperature are known as "freezers" and "coolers", respectively.

Fresh meat carcasses are put in the coolers to ripen, after which they are cut and placed in the freezers, unless the cuts are put "in cure". Meat is also held frozen until there is opportunity and capacity for curing. Meats are exported in a frozen condition or in a cured state.

Butter is also held in freezers, but cheese can be held in coolers, as can egg powder and milk powder. Frozen egg meats are held at low temperatures awaiting use or drying. Eggs and milk can be exported in huge quantities in comparatively small space when in the form of powder, but the powder should be stored in coolers to be marketed in the best condition.

When fish are frozen slowly large crystals are formed in the cells of the flesh. When the fish are thawed for cooking the expansion of the melting crystals breaks the cell structure. If, however, fish are frozen rapidly at very low temperatures, then held at somewhat higher temperatures and shipped in refrigerated cargo space, the cells retain their structure when cooked by the ultimate consumer, because the initial rapid freezing causes the formation of only tiny crystals which melt without bursting the cell walls.

Fresh fruits and vegetables are held for long or short periods in cooler space, but, of recent years, "quick-freezing" has been applied to these commodities and many kinds are packaged and held in the freezers for future delivery in the frozen state.

No. 155. Sun. Mar. 4, 1945 — High Food Value Scarlet Runners

The scarlet runner bean has been neglected by gardeners in Canada. This is probably due, for the most part, to lack of knowledge of the great merit of this type of bean for culinary as well as ornamental purposes. The chief culinary use of the scarlet runner is as a snap pod. It should be quickly grown to avoid fibre, and for the same reason must be harvested while still young and tender. At this stage they may also be gathered for preservation for winter use by salting.

A layer of salt to a depth of 1/8-inch should be on the bottom of a large stone crock and then a 1½inch layer of beans. These are first sliced into long shavings. About the same amount of salt as that used on the bottom of the crock is poured over the beans and another layer of beans added. The proportion of beans to salt may be increased somewhat when the brine has formed. After processing all the beans on hand, a large plate is put on top and weighted down with a heavy stone. When the next lot of beans is ready, the process is repeated.

To prepare for the table, sufficient beans for a meal are removed from the crock, washed with cold water to remove adhering salt, and placed in a saucepan with boiling water. They are then boiled for three, six or seven minute periods, the water being poured off each time and fresh boiling water added. By this method all saltiness is removed and the beans remain tender. A more common method is to soak in water overnight, strain and boil for 15-20 minutes, but some toughness may result.

Culture of the runner bean is relatively easy. It should be staked for highest yield, quality of bean and ease of picking. The seeds do not germinate well in

cold soil, and the young plants are tender, so that sowings should not be made until the regular time of planting other pole bean varieties. They may be sown in single or double rows or in hills according to personal preference. For quick vigorous growth and succulent pods, an abundance of plant food is required and particularly on soils of relatively low fertility, it is advisable to dig a trench about a foot wide and 12 to 14 inches deep, working in a three-to-four inch layer of well rotted barnyard manure or good garden compost before replacing the topsoil. Where available, irrigation will pay dividends in promoting rapid growth during dry weather.

No. 156. Mon. Mar. 5, 1945 -- Basic Chemicals in Canada

The manufacture of basic chemicals now ranks as a major industry in Canada, making an important contribution to the utilization of the country's natural resources, to employment, to foreign trade, and to all other phases of the economic structure. Progressive and financially sound, the leading concerns in this business have steadily extended their operations and added to the variety of their products.

Information regarding the beginning of the chemical manufacturing industry in Canada is very sketchy. The output of chemical factories in 1890 was valued at slightly more than $2 millions, but it seems certain that this included some allied products as well as basic chemicals. The industry at that time was very small - a sulphuric acid plant had begun operations a few years previously, the manufacture of methyl alcohol by the destructive distillation of wood had been started, some nitroglycerine was being made for use in explosives, and some ethyl alcohol was being produced. The next decade, however, saw the start of the electro-chemical industry with the building of a carbide plant at Niagara Falls, and a phosphorus works at Buckingham, Quebec.

From the turn of the century to the outbreak of the First Great War there was continued expansion featuring the opening of large works to make carbide at Shawinigan Falls, Que., cyanamide at Niagara Falls, Ont., and electrolytic caustic soda at Windsor, Ont. With the war of 1914-18, there came heavy responsibilities to manufacture special chemicals for munitions purposes and a considerable number of new plants and extensions were erected. Some of these developments were essentially for war needs, such as the manufacture of trinitrotoluene, cordite, etc., and were discontinued soon after the armistice, but others were of a fundamental nature and remained as part of the permanent industry. Outstanding among the latter was the synthetic acetic acid and acetone plant at Shawinigan Falls, Que.

The period between the wars was characterized by a steady over-all advance in both volume and diversity of products, including such outstanding developments as the manufacture of soda ash at Amherstburg, Ont., and of sulphuric acid from waste smelter gases at Copper Cliff, Ont., and at Trail, B.C. In this period there was also consolidation within the industry through the merger of smaller units into large concerns. There was remarkable progress also in technical skill, in research, and in the training of personnel. When the present war began, the industry was well fitted in these essentials to undertake the heavy responsibilities that were to be placed upon it.

No. 157. Tues. Mar. 6, 1945 -- Wartime Expansion of Chemical Industry

In the current transformation of Canadian chemical industry for war production, probably no aspect has been more important than the explosives and chemicals program. Before the outbreak of hostilities the explosives industry in

this country was occupied almost entirely in meeting ordinary commercial requirements, and consequently the chemical industry lacked facilities to feed a large-scale munitions plant.

In October, 1939, under the Defence Purchasing Board, the future Chemicals and Explosives Branch of the Department of Munitions and Supply was set up to expand explosives production and to place the chemical industry on a parallel course of development. Since that time in every part of the country great plants have mushroomed up. Almost three score separate projects, involving expenditures of more than $160 millions, have been undertaken, some being only extensions and others entirely new works, some for explosives, some for shell filling, some for grenades, fuse powders and pyrotechnics, but about half for special chemicals required in the over-all program.

It is estimated that the production of chemicals in Canada has expanded threefold since the beginning of the war to reach a total value in 1943 of about $110 millions. To-day the industry stands as one of the nation's leading activities. It now supplies about 70 per cent of the country's chemical needs, and in addition makes a substantial contribution to export trade. It has buildings and capital equipment valued at $120 millions, employs 10,000 people, and distributes annually $18 millions for salaries and wages and $40 millions for materials, fuel and power. It includes some of the largest industrial establishments in the Dominion. This field of manufacture is dominated by a few major producers, with two score or so smaller firms completing the list.

No. 158. Wed. Mar. 7, 1945 -- Alkalis

The alkalis division of the Canadian chemical industry is based upon the salt deposits of southwestern Ontario. Underlying the Windsor-Sarnia district is a salt bed of vast extent. The approximate area of this basin is about 3,000 square miles, and the bed at points is 230 feet thick, at which average thickness a block of one of one square mile would contain 400 million tons of salt. The salt is brought to the surface as brine, of which about half is evaporated to produce ordinary salt, while half is used for chemical purposes.

At Windsor, brine is treated electrolytically to produce caustic soda and liquid chlorine. Built in 1912 and operated continuously since that date, this works added in 1930 an extension to utilize the hydrogen, which formerly went to waste, in the manufacture of ammonia, this being the first synthetic unit in Canada. Other lines have been added from time to time, including bleaching powder, ferric chloride, sulphur monochloride, sulphur dichloride, and sodium hypochlorite.

To meet the demand of the expanding pulp, rayon and cellophane industries in Eastern Canada, a caustic-chlorine plant was erected in 1934, at Cornwall, Ont. In 1938 another was opened at Shawinigan Falls, Que. For these projects the salt is brought by boat from Windsor, the raw material in this instance being transported to the source of cheap power and to the principal markets for the finished products.

Another important plant using salt brine as its chief material is operated at Amherstburg, Ont. Built in 1919, it is the country's only producer of soda ash and also, since 1934, of calcium chloride, which is recovered as a secondary product in the Solvay process.

While these alkali producers are presently working to capacity and in some instances have extended their facilities since the war, there were substantial imports under these headings in 1943, amounting to 5,798 tons valued at $256,348 for caustic soda and 70,557 tons valued at $1,213,818 for soda ash.

No. 159. Thurs. Mar. 8, 1945 -- Acids - 1.

In the acids division of the chemical industry, Canada has long been self-sufficient in regard to inorganic acids, but has been very largely dependent on foreign sources for her supply of organic acids. One of the earliest sulphuric acid plants was at Capelton, Que., at which location there was a considerable supply of pyrites from nearby mines. Built in 1885, it operated steadily until 1925, when it was dismantled.

The first unit using the contact process was built in 1908 at Sulphide, Ont., with pyrites as the chief source of sulphur, and the first plant to utilize smelter gases was established at Coniston, Ont., in 1927. Three new plants have been built since the outbreak of the war to make ten producers in all. Output of sulphuric acid in 1943 totalled 621,435 tons as compared with the highest pre-war tonnage of 282,716 in 1937.

The successful recovery of sulphuric acid from smelter gases has been one of the outstanding developments of the industry. Previously the raw materials for its manufacture were either sulphur or sulphur-bearing ores and, with the exhaustion of the latter, more dependence was placed on elemental sulphur imported chiefly from Texas.

In the search for a cheaper source of sulphur, attention was turned to the sulphur gases which belched from the stacks of Canada's huge metal smelters. In 1927 a test plant was built at Coniston, Ont., in connection with the nickel smelter at that point, and it proved highly successful. In 1930 a larger and permanent unit was established at the smelter at Copper Cliff, Ont.

Even more striking were the developments arising out of the utilization of the gases from the lead-zinc smelter at Trail, B.C. For some time the operation of this plant had occasioned claims for damages done by the sulphur-bearing gases to crops on nearby lands, and this problem assumed international proportions when complaints came from across the border.

This condition of affairs and the desire to eliminate waste led to an extensive program of research which culminated in the building of one of the largest chemical plants in the country. It was decided to use the waste gases to make sulphuric acid, which in turn could be used to make ammonium sulphate for fertilizer purposes.

At this point there is now the largest acid plant in the country, a huge synthetic ammonia plant, an ammonium sulphate plant, a phosphoric acid plant, and an ammonium phosphate plant. The final products are the nitrogen-bearing fertilizers, ammonium sulphate and ammonium phosphate, which are chiefly for export. Since 1934 elemental sulphur has been recovered also by means of a new process, this being Canada's only source of pure sulphur. Unfortunately, it is far distant from the large users in Eastern Canada and is shipped chiefly to consumers in British Columbia or the Western United States.

No. 160. Fri. Mar. 9, 1945 -- Acids - 2.

Nitric acid is made at Sulphide and Welland, Ont., and at several explosives plants at other points; muriatic acid in plants at Hamilton and Cornwall; cresylic acid at Toronto; phosphoric acid at Buckingham, Que.; stearic acid and lactic acid at Toronto; and oxalic acid at Hamilton, the last-mentioned being a very recent development.

Glacial acetic acid is made at Shawinigan Falls, Que., in one of the great chemical plants of the Empire. As early as 1903 the power developments at this point had attracted a carbide plant which has continued to operate ever since. But during the war of 1914-18 it was greatly expanded. The Allies were then in urgent need of acetone for T.N.T. and later for acetic acid for the manufacture of cellulose acetate, an essential compound for the treatment of aeroplane wings.

A process was worked out by Canadian chemists by which these chemicals could be made synthetically from calcium carbide, and in 1916, at the request of the British Government, the capacity of the carbide furnaces was enlarged, and a large chemical plant was erected. At the close of the war the demand for acetone ceased, and the company soon discontinued its manufacture, but improvements in its process for making acetic acid and an increasing demand enabled the company to expand its output and ship to markets in all parts of the world.

Continuous research has led to the commercial production at this plant of many acetylene derivatives, including butyl acetate, ethyl acetate, acetylene black, acetic anhydride, pentasol acetate, vinyl acetate, vinyl acetate synthetic resins, dibutyl phthalate, and butyl alcohol. It is interesting to note that production of acetone was begun in 1936 by an entirely new process. In normal times this company is a large exporter, particularly of carbide, acetic acid, acetylene black, and vinyl resins.

In 1943 Canada's exports of acids, chiefly acetic and sulphuric, were valued at $2,519,000. Imports were valued at $4,328,900, with tartaric, acetic, citric, salicylic, boracic, and stearic acids as the principal items.

No. 161. Sat. Mar. 10, 1945 - Other Chemicals

Still other works in Canada are concerned chiefly with the manufacture of chemicals other than acids or alkalis. At Niagara Falls, Ont., there is the largest cyanamide plant in the world. Started in 1909 with an initial capacity of 5,000 tons annually, subsequent additions and improvements had brought the pre-war capacity to 355,000 tons. This tremendous tonnage is obtained through the operation of what was at that time the largest lime-burning plant in the world, the largest carbide furnaces and the largest liquid air plant for the preparation of pure nitrogen.

The calcium cyanamide, which is made by absorbing nitrogen in calcium carbide at white heat, is used chiefly as a fertilizer, and most of the production is exported. A large portion of the output, however, is used to make cyanide for use by the Canadian mining industry or for export. Sodium silicate has been produced by this company since 1932.

Phosphorus, phosphate chemicals and chlorates are made at Buckingham, Que., the plant there being the sole producer of these items in Canada. Established in 1897 to utilize the phosphate ores in the vicinity, it has been operating for some years mainly on imported rock. Phosphorus and phosphoric acid were the main products for most of this period, but in the past decade the company has gradually developed a very diversified line of chemicals including monosodium phosphate, disodium phosphate, trisodium phosphate, calcium phosphide, sodium acid pyrosodium phosphate, barium chlorate, ammonium chlorate, sodium chlorate, potassium chlorate, and potassium perchlorate.

There is another important works in the general chemical field at Hamilton. Besides sulphuric and hydrochloric acid, this plant produces Glauber's salt, salt cake, anhydrous sodium sulphate, sodium metabisulphite, sodium thiosulphate, liquid sulphur dioxide, ammonium chloride, and zinc chloride.

Ammonia and its compounds have been in heavy demand for war uses, and facilities for increased capacity have involved major expenditures in the last few years. At the outbreak of war, synthetic ammonia was being made at Trail, B.C., for use in nitrogen fertilizers, and at Windsor, Ont., for the manufacture of blasting explosives, and some aqua ammonia was recovered from gas liquor in a plant at Toronto.

War requirements brought expansion of the Trail facilities as well as a new government-owned unit at that point, a new plant at Calgary, Alta., operated on behalf of the Government, and a new works near Welland, Ont., also built for the Government but operated by a private company. The Calgary works is unique in that it uses natural gas as its primary material; at Welland the coke process is used. All these plants make anhydrous ammonia and ammonium nitrate.

In 1943 when war demands slackened and a shortage of fertilizer developed in the United States and Canada, steps were taken to utilize the excess ammonium nitrate capacity to provide a material suitable for fertilizer use. This was made possible by a research program which resulted in the making of a prilled or pebbled form of ammonium nitrate, properly conditioned to render it free flowing when used. A large tonnage of the nitrate was exported to the United States in 1943.

No. 162. Sun. Mar. 11, 1945.-- Timber and Lumber in Eastern Canada

The clearing of forest land was the primary step toward the settlement of eastern Canada by the early pioneers. The material so removed was at first more than sufficient for building purposes, fencing and fuel. Later on, inroads were made into the forests surrounding the farms and settlements to supply the needs of the growing population, and lumbering as a business developed gradually as the settlement extended, the demand increased and the supply receded.

During the French regime, lumbering did little more than supply the domestic needs of the inhabitants. Nevertheless, towards the end of the period, a fair business in timber had been established in connection with the shipbuilding industry, and the technique of sawing and floating logs had been learned. For instance, in 1752 ten ships of 40 to 100 tons burden each were launched at Quebec, for which the lumber had been floated down the Richelieu and the St. Lawrence.

As early as 1700 New France provided masts and spars for the French navy, but, although several attempts were made throughout the period to develop a market in France for Canadian timber, the distance proved to be an insuperable obstacle and these efforts came to nothing.

After the formal cession of Canada to England by the treaty of Paris in 1763, the same obstacle made it impossible for the new colony to compete with the Baltic countries from which Great Britain obtained all ordinary types of timber and boards. It was not until the American Revolution suddenly deprived Great Britain of her carefully fostered source of masts, so essential to her navy, that Canada's forest products gained a foothold on the British market.

No. 163. Mon. Mar. 12, 1945 -- Earlier Development in Eastern Canada

The timber industry of New Brunswick dates from 1784, when the British Admiralty turned to the pineries of that province for a reliable supply of masts and spars. About the same time the West Indies began purchasing from the loyal colonies of the north the supplies which they could no longer secure from New England, again as a

consequence of the American Revolution. Pine boards and hoops from Nova Scotia and New Brunswick and white oak barrel staves from the Province of Canada were among the first commodities exported to the Islands of the Caribbean.

It took another political upheaval to create a real market for Canada's timber. Following the French Revolution and the rise of Napoleon to power, the Baltic was closed by 1808 to British trade. Again Great Britain turned to her North American colonies for the timber she so badly needed.

To induce the British merchants to risk their capital in the development of a new industry so far from home, the British Government offered large timber contracts and the protection of a very high tariff wall against foreign countries. So it was that the British timber firms began sending agents to Quebec, Saint John and a few other ports in the Maritimes to establish branch houses. The agents, or "factors" as they were called, awarded contracts for cutting or bought whatever timber was offered to them. Often they financed the "lumbermen" who engaged in the business of felling trees and bringing the timber in rafts or cribs to the shipping point.

After the Napoleonic wars were over, the so-called "differential duties" were maintained at a high level for many years, and the Canadian timber trade prospered, even when the preference was gradually reduced from 1842 to 1851 and removed altogether in 1860.

No. 164. Tues. Mar. 13, 1945 -- Square Timber and Deals

At first the British demand was chiefly for "square timber" - long, large hand-hewn pieces of the finest white pine. The trade in square timber grew rapidly, but not without many ups and downs. Whenever it was rumoured that the duties would be reduced, an intensive production took place, followed by a considerable drop when the new duties became effective. After a few years the industry would adapt itself to the new conditions and rise again to higher levels. The trade in square timber reached its peak about 1865, after the preference on colonial imports had ceased to exist. In that year, exports of square timber from the port of Quebec alone reached approximately 280,000,000 feet board measure.

As the nearby stands were soon depleted, the lumbermen had to go ever farther in their search for suitable trees and the square-timber trade became less and less profitable. It was also a very wasteful trade, much of the best logs being left in the forest in the form of worthless chips and slabs. Before long, lumbermen found it to their advantage to manufacture sawn lumber instead of squaring logs. For the British market they produced "deals", that is according to English trade usage, planks three or more inches thick.

The trade in "deals" did not grow as fast as the trade in square timber, but beginning in 1835, imports of deals from British North America into Great Britain exceeded those from the Baltic countries, and retained first place until the differential duties were removed in 1860. Even then Canadian deals competed successfully with the product of the more favourably located North European forests.

The square timber trade began declining rapidly in the 'seventies' and by the end of the century it had disappeared. The deal trade also diminished in much the same manner but it did not cease altogether. Before the start of the present war, a few firms disposing of exceptionally fine timber limits were still cutting deals for the British market.

The decline of the trade in square timber and deals with Great Britain was due to other causes besides the depletion of stands of high-quality pine and spruce. For many years there was no other market for Canadian woods. The neighbouring United States had at first sufficient supplies of their own; besides the ports of both countries were closed to each other's ships after the Revolutionary War. As the sea was practically the only means of transportation available, there could be little or no trade.

No. 165. Wed. Mar. 14, 1945 -- Rise of Demand for Lumber

As the American settlers pushed westward in ever-increasing numbers and urban centres developed prodigiously in the New England states, some American forests were cleared for settlement and destroyed and others were used up to supply the insatiable demand of the cities. Then an extensive system of canals was completed in Canada as well as in the United States, which greatly facilitated the exchange of goods. Later came the railroads to open up new regions and new sources of supply and to link these with the large centres where the products found a ready market.

The influence of the mounting American need for lumber was soon felt in Canada. Canadian lumbermen were prompt to realize the opportunities offered by a large market close to them and not so hard to please as their British customers. Sawn planks and boards of almost any kind were in great demand across the border, and these could be produced and sold more profitably than square timber and deals.

As early as 1827, shipments of pine boards, pine planks, shingles and sawlogs were recorded at the inland port of St. Johns in Lower Canada on their way to New York through the Richelieu River, Lake Champlain and the Champlain Canal and down the Hudson River. With the opening of the Chambly Canal in 1835, the trade through St. Johns increased considerably.

It was about this time also that Canadian timber lands and sawmills began attracting American capital. During the period from the crisis of 1837 until the end of the depression of 1847 the movement of American capital was halted, but it was resumed on a larger scale from 1848 onward and reached still greater proportions after the Reciprocity Treaty of 1854 was signed.

This influx of American capital contributed to the development of the lumbering industry in all parts of eastern Canada, from New Brunswick to Georgian Bay. But the Reciprocity Treaty was not an unmixed blessing; under its stimulation American lumber men invaded the Canadian forest, stripped it of its best pine and then abandoned their mills and moved on to Michigan, Wisconsin and Minnesota, when these regions were opened up by the building of railroads.

The Reciprocity Treaty came to an end in 1866. Despite the new tariff of 20 per cent, American demand was so great that Canadian lumber shipments increased at a rapid rate for several years. In 1868 exports of wood products from Ontario and Quebec to the United States exceeded for the first time similar exports to Great Britain.

No. 166. Thurs. Mar. 15, 1945 -- Trends in Lumber Production in Present Century

From the end of the nineteenth century until after the first Great War, a tremendous industrial expansion took place on both sides of Canada-United States border. In Canada, new settlers from Europe spread all over the Prairie Provinces;

extensive mining operations began in Northern Ontario; new railroads facilitated communications. During this period also completion of the Panama Canal opened up the European markets to the fine lumber of British Columbia. All this prosperity had its repercussions on the Canadian lumber industry which now had a fairly important domestic market, while the United States market continued to absorb all that was offered to it and the trade with Great Britain remained fairly steady, although not as important as in former years.

In 1911 the total Canadian production of lumber reached a peak of 4,918,202 thousand feet. However, a good part of this was from British Columbia and the Eastern Canadian industry was already struggling to hold its own, even in the domestic market.

After the war of 1914-18 the Eastern industry declined rapidly, while that of British Columbia rose until it accounted for more than half of the total Canadian production. Accessible forests in the East had been almost depleted of merchantable timber, and rising costs of exploitation made it impossible to meet the stiff competition of the Baltic countries on British markets. The Hawley-Smoot Tariff of 1930 and the United States Revenue Act of 1932, closed the American market almost completely to Canadian timber, but affected the Eastern Provinces much more than British Columbia.

When the Imperial preference was instituted in 1932 by the Ottawa trade agreements, lumber production had fallen to 1,809,884 thousand feet. Of this quantity, Eastern Canada - the Maritimes, Quebec and Ontario - accounted for only 767,154 thousand feet, which was much lower than in 1851 when the production of the Maritimes and Lower and Upper Canada was approximately 1,300,000 thousand feet.

From 1933 until the start of the second World War in 1939 there was an almost continuous recovery, in which the Eastern Canadian lumber industry had its share. In addition to the effect of the Ottawa treaties, new trade agreements with the United States, in effect since the beginning of 1936, have again made this market available to Canadian producers.

No. 167. Fri. Mar. 16, 1945 — Lumber Industry During the War

As at the beginning of the previous century, the outbreak of war in 1939 cut off Great Britain from the Baltic countries which normally supplied a large proportion of her lumber requirements. Again Canada was practically the only source of supply available, but this time she was also an active participant in the struggle, and her immense forest resources were not only placed at the disposal of Britain and the other United Nations but were used in the execution of the ambitious industrial program which Canada had set as part of her contribution to the common cause.

The part played by the lumber industry in the war effort of Canada has been limited only by its production facilities and the availability of man-power. All producing regions, from the Atlantic to the Pacific, were operated at maximum capacity.

Production of sawn lumber alone rose to 4,629,052 thousand feet board measure in 1940 and to an unprecedented peak of 4,941,084 thousand feet board measure in 1941. Production in 1942 was only slightly lower than in 1941, amounting to 4,935,145 thousand feet board measure. For 1943 and 1944 the production has been estimated at 4,640,000 thousand feet board measure and 4,630,000 thousand feet board measure, respectively.

In the first year of the war, Canada exported 1,616,909 thousand feet board measure of lumber to the United Kingdom alone and consumed about 430 million feet for the construction of naval, military and air force establishments and for new munitions factories. In 1941 the building program was almost as large but only 826,804 thousand feet of lumber were shipped to Britain. By that time, however, most of the new factories were in full production and the demand gradually increased for lumber to make boxes, barrels and crates, required for the shipment overseas of munitions, food and other supplies; it has been estimated that about 600 million feet were used for this purpose in 1943. Large volumes of lumber were also needed for use in ship-building and aircraft construction and other domestic requirements related to the successful prosecution of the war, such as essential mines, railway rolling stock, wartime housing, etc.

Besides all these demands, it was necessary to maintain exports of lumber to non-sterling countries to provide urgently needed foreign exchange. In 1940 Canada shipped 651,315 thousand feet of lumber to the United States, only slightly more than in 1939, but in 1941 shipments to that country almost doubled, amounting to 1,231,588 thousand feet. After Pearl Harbour there was such a demand from the United States that shipments reached 1,432,128 thousand feet in 1942.

By then the upward trend of Canadian forest production had been checked and in order to provide sufficient supplies for Britain and for Canada's own war needs, it became necessary to make all exports to non-Empire countries subject to permit. Nevertheless, Canada's exports to foreign countries in 1943 amounted to 737,739 thousand feet of planks and boards alone, of which 729,201 thousand feet went to the United States.

Canada has lost during the war her markets in Continental Europe and China but has increased her exports to practically all Empire countries except Australia, to several of the countries of South America, especially to Argentina, Peru and Chile, and to Iceland. She has actually found several new customers, such as Bolivia, Venezuela, Greenland and the Virgin Islands.

No. 168. Sat. Mar. 17, 1945 -- Timber and Lumber in British Columbia

In 1786 James Strange, of the East India Company, wrote from Nootka, on Vancouver Island: "There is no doubt that the timber with which this coast is covered (and which in its size and fine grain is nowhere to be excelled) would compose a valuable addition to our trading, as this article carries a very advanced price in China and is always in demand there, especially such as is fit for masts and spars".

James Strange's wish was soon to be realized, for in 1788 Captain John Meares sailed for China on a ship built at Nootka and loaded there with furs and spars. Captain James Cook, the great navigator, had discovered Nootka Sound only ten years before, and he and the explorers who followed him had already taken advantage of the wonderful trees of the new country to refit their vessels.

After the explorers came the fur traders. Construction of a saw-pit always preceded the building of a new trading-post. The saw-pit at Fort St. James, established in 1806 by the Hudson's Bay Company, was probably the first one operated in what is now British Columbia. The first sawmill in the Northwest was erected in 1827-28 by Dr. John McLoughlin at Fort Vancouver, another of the Company's posts, on the northern shore of the Columbia River in Old Oregon, which was then considered British territory. Capable of sawing 2,000 board feet per day, this mill produced more lumber than was needed locally and it is recorded that a first cargo of deals was shipped to Hawaii in 1829 and another to the China market in 1832.

After the settlement of the Oregon boundary dispute in 1846, the Hudson's Bay Company moved its headquarters to Victoria and soon new and larger mills were erected nearby at Parson's Bridge and at Albert Head, both being unsuccessful for various reasons. Captain Stamp's famous mill at Port Alberni, on the west coast of Vancouver Island, began its operations in 1861. It had a capacity of 18,000 feet of planks daily and in the first five years produced approximately 35 million feet of lumber, practically all for the export trade.

Development on the mainland took place at almost the same time. The discovery of gold on the lower Fraser River attracted thousands of prospectors from California. Although most of them left the country almost immediately, a sufficient number remained as settlers, and the lumber they needed was soon provided by new mills at Fort Yale (1858), Fort Langley (1859), New Westminster (1860) and elsewhere. In 1863 the first sawmill on the north shore of Burrard Inlet, where North Vancouver is now located, came into operation, to be followed by another on the south shore in 1865, the latter built by Captain Stamp of Port Alberni fame.

In 1871, the colonies of Vancouver Island and British Columbia entered Confederation. Official records for that year show that lumber export was valued at $182,490, and went chiefly to South America, China and Australia.

There was, however, little expansion of the lumbering industry in British Columbia before 1880. Construction of the transcontinental railway began in that year and absorbed huge quantities of lumber for ties, camps, etc. By the time the railway was completed, the prairie country was being settled rapidly and a new market for British Columbia lumber was available.

No. 169. Sun. Mar. 18, 1945 -- Domestic Market Predominant until 1910

The demand from this market was so great that little was left for export. For the period 1910-14 less than five per cent of the total production was sold abroad, while close to 70 per cent was shipped to the Prairie Provinces and about 25 per cent was used in British Columbia.

The growth of the lumber industry in British Columbia from 1848 to 1910 is shown by estimates prepared by the Forest Branch of the British Columbia Department of Lands.

The industry reached its peak in 1910, in which year production of lumber alone amounted to 1,619,904 thousand feet and was valued at $24,823,441. As immigration to the Prairie Provinces began to decrease shortly afterwards, the British Columbia mills had to look for other markets, but because of lack of shipping space resulting from the first World War, the mills were unable to fill the orders they had obtained. In 1915, lumber production in British Columbia fell to about one-half of its pre-war level.

After the war of 1914-18, there was an immediate improvement. Ocean tonnage was now plentiful and British Columbia shippers could take advantage of the Panama Canal to sell their lumber on the Atlantic Coast and in Europe. It found a ready market in the New England states and even worked its way to Quebec and Ontario, thereby seriously affecting the lumber industry of Eastern Canada.

The lumber industry in British Columbia rose rapidly until in 1926 it accounted for more than half of the total Canadian production, a position it has consistently maintained ever since. It recorded its highest point in 1929 with 2,460,500 thousand

feet board measure out of a total of 4,741,941 thousand feet board measure for all Canada. In that year 54.9 per cent of British Columbia's shipments of lumber went to domestic markets, 27.5 per cent to the United States, 10.2 per cent to other foreign countries and 7.4 per cent to Empire countries.

In 1932, however, following the world-wide depression and the adoption of the Smoot-Hawley tariff in the United States, production fell to only 934,373 thousand feet board measure in British Columbia and to 1,809,884 thousand feet board measure in all Canada. There had already taken place a considerable shift in markets. Domestic shipments now represented only 49.3 per cent and United States shipments 11.5 per cent, while other foreign countries accounted for 12.1 per cent and Empire Countries absorbed 27.1 per cent.

The Ottawa Conference in 1932 gave fresh impetus to lumber production in British Columbia as well as in Canada as a whole. From 1933 until the start of the second World War there was an almost continuous recovery. As a result of the trade agreements with the United States, this market has been open to British Columbia lumber since 1936.

No. 170. Mon. Mar. 19, 1945 -- Lumbering Methods in British Columbia

In British Columbia the enormous size of the trees and the rugged character of the country give rise to logging and sawing methods entirely different from those in use in Eastern Canada.

Logs may sometimes measure as much as 40 feet in length and 66 inches in diameter at the top and weigh more than 20 tons. The average log in booms of better-grade fir often runs to 32 feet by 45 inches and weighs close to 11 tons.

There are few drivable streams in British Columbia. At first the forests extended to the water's edge and trees were felled close to the shore and were rolled into the ocean by means of jackscrews and wedges. Later, as cutting took place farther inland, oxen, horses and mules were used to haul the logs along "skidroads" to tidewater. The distance to tidewater soon increased and with it the cost of animal traction. This brought about the introduction of small railroads to transport the logs to the log-dumps at the water's edge; oxen and horses were still used to bring the logs to rollways by the side of railroads.

The steam donkey came into general use in the 'nineties. It was then used to haul the logs on the ground by means of long cables wrapped several times around a spool connected to the engine. By 1915, the "ground lead" had been replaced by the"high lead". According to this spectacular method, large steel blocks or pulleys are attached to trees, 150 to 200 feet above the ground, and cables from the donkey engine are passed through the pulley and attached to the logs, which are dragged in, one end clear of the ground, or, if a "sky line" is used, dangling in mid-air.

Nowadays, powerful tractors and trucks are used extensively and permit greater flexibility, but donkey engines and logging railroads still play an important part in the operations on the Coast.

After reaching tidewater the logs are assembled in booms and rafts and are towed to the sawmills. There also the size of the logs necessitates the use of special equipment. Carriages and log-deck machinery must be of exceptional size, ruggedness and power to handle the huge logs. Often the smaller logs are sorted and sawn with smaller equipment in separate plants. Bandsaws are now in general use, but for many years enormous circular saws were preferred.

Because the use of such special equipment involves great capital investments and operating costs, the lumber industry in British Columbia is concentrated in large production units. A tabulation of sawmills of that province, classified according to gross value of products, shows that 25 mills having a production of $1,000,000 and over accounted for 60.7 per cent of the total in 1942; 14 mills in the $500,000 to $1,000,000 class produced 11.5 per cent; 46 mills in the $200,000 to $500,000 class, 15.2 per cent; and 341 mills producing less than $200,000 the remainder or only 12.6 per cent.

Most of the smaller mills are located in the interior of the province, where the trees are smaller and operating conditions closely resemble those of Eastern Canada. The operations on the Coast, not being dependent on frost, snow or freshet, are carried on in most cases throughout the entire year.

No. 171. Tues. Mar. 20, 1945 — Wartime Production of Lumber in British Columbia

The part played by the lumber industry of British Columbia in Canada's war effort has been considerable. It has accounted for 50.2 per cent of all sawn lumber produced in Canada in 1940 and for 48.7 per cent and 46.7 per cent, respectively, in 1941 and 1942. It has also produced large volumes of box shooks for crating purposes, veneer and plywood for airplane production, ties for railroads, shingles and other products for essential war uses.

Since the abnormal demand for shipping space and the high rate of losses of tonnage in the Atlantic combined to make it impossible for vessels to spend the time needed for the long voyage through the Panama Canal, large quantities of British Columbia lumber were shipped to the United Kingdom, South Africa, the West Indies and other destinations through Eastern Canadian ports. The two great railway systems handled transcontinental shipments of as much as 80 million feet of lumber in a single month.

Exports of Douglas fir to the United States quadrupled in volume and shipments of cedar and hemlock about doubled from 1939 to 1941. Although the controls imposed in 1942 checked the flow of Canadian lumber to that country, shipments of British Columbia lumber remained at fairly high levels.

When hostilities cease, the lumber industry in British Columbia will no longer be handicapped as at present by the shortage of manpower and by transportation problems.

The supply of accessible raw material in British Columbia has been estimated at 109,738 million feet board measure of softwood. Under good forest management, the industry can, therefore, operate on a large scale for many years to come. True, the stands of Douglas fir have been depleted to a certain extent and the production of this species may be expected to decline gradually, but the use of hemlock and cedar is likely to develop both at home and abroad.

British Columbia can reasonably expect to ship large quantities of lumber for the reconstruction of war-torn Europe. Its product is favourably known in Great Britain, and a large portion of that country's imports for its extensive building program will undoubtedly come from British Columbia's forests.

Australia, South Africa, and China should also offer fair markets for British Columbia lumber. If the usual trade with the United States is also maintained and new markets are developed in South America and elsewhere, the outlook for the lumber industry in British Columbia will be promising.

No. 172. Wed. Mar. 21, 1945 -- Alewives

Fishermen in some parts of the Maritime Provinces may speak of landing 'gaspereaux', their neighbours, not very far away, will talk of catching 'alewives', but they'll all be talking of the same kind of fish, whichever name is used. So, too, in the United States both terms are used, though, there, 'alewife' is perhaps the better known. In some places in the United States other names are also given this fish - 'Branch herring' for instance, 'Big eyed herring', and several others. Coupling herring in the name is natural enough, of course, for alewives and sea herring belong to the same family, Clupeidae, and that, by the way, makes them kin of such other fish as the shad and the pilchard.

Although the alewife is a member of an important family it is not itself of first rank among Canadian commercial fish, but nevertheless, in various parts of the Maritimes it brings the local fishermen a fair return each year. On the trade side, it has had regular place in export business with the British West Indies and some other southern markets for a good many years, not the fresh fish but pickled. In exterior colouring the fish itself is greyish-green on the back, its silvery sides variegated with dark stripes, though sometimes the shading on the back may run toward bluish. The head is short, and a distinctive marking is a black spot behind each gill-cover, near the top. In length the mature alewife may measure, say, twelve inches and in weight it may average something like nine or ten ounces. It is similar to the herring in flavour and fatness.

The alewife is one of the anadromous fishes; that is, it comes into fresh-water streams to spawn but spends most of its life in the sea. Spawning time is in the spring or early summer. The eggs take only a few days to hatch and the baby fish set out for salt water when about a month old. Not a great deal is known definitely about the alewife's ocean life but apparently the fish comes to maturity when three or four years old, and then makes its way toward land and the spawning grounds. After spawning it goes back to sea, returning landward again in due season to reproduce.

As for the alewife's whereabouts, the fish is widely distributed. To quote one Canadian authority, the alewife is "widely distributed from the coasts of the Maritime Provinces and Labrador, and embracing the St. Lawrence River, to Lake Ontario, in which lake it is very abundant: extends along the Atlantic coast of the United States from Maine southward to the Carolinas: occurs landlocked in certain lakes of the State of New York". Notwithstanding the extent of its Canadian distribution, however, the fish is not ordinarily taken commercially anywhere in the Dominion except in the Maritime Provinces, with the great bulk of the catch being landed by Nova Scotia and New Brunswick fishermen. Out of total landings of slightly less than 10,600,000 pounds in 1943, for example, some 6,102,000 pounds were taken in Nova Scotia areas and about 4,470,000 pounds went to the credit of New Brunswick. All told the catch was worth about $515,000 on the market.

In Lake Ontario, notwithstanding its abundance of alewives, there is no commercial fishing for them. Those which are landed are only an incidental part of catches made by gill-nets set for other fish. Nevertheless, says an interesting comment by an Ontario fisheries biologist, the alewives in the lake "are indirectly valuable in that they supply an important food item in the diet of lake trout, ling and eels ...".

No. 173. Thurs. Mar. 22, 1945 -- Nickel Production in Canada

Canada has long been known as the principal source of the world's supply of nickel, yet its discovery in association with copper was somewhat of an accident.

The metallurgy of its extraction had to be worked out and the development of its early uses is most interesting. Its main properties were discovered when production in Canada was assured.

The fact that a small quantity of the metal alloyed with steel rendered the resulting product high in tensile strength made nickel most valuable for armour plate, and in the race for naval construction, Canada's supply placed the British Empire in a preferred position. New Caledonia, in the Pacific, owned by France, was the only real source of nickel prior to the discovery of the Sudbury deposits, so that France and the British Empire really controlled the supply of nickel.

Nickel was not refined in Canada prior to the last Great War. The principal refinery in the British Isles was at Clydach, Wales, to which the Mond Nickel Company shipped its matte. The International Nickel Company shipped its matte to Huntington, West Virginia. This company was the largest producer and it was felt by the authorities that better control could be maintained over the production if it was refined in Canada, and this was the reason for the construction of the refinery at Port Colborne. A natural alloy of nickel and copper, known as monel metal, is continuing to be made in the United States, and refined nickel is still produced at Clydach.

Because of the disarmament trend after the last war, nickel became a drug on the market; but intensive metallurgical research showed wide uses for it in peacetime products, such as in automobiles, mining machinery, and in all equipment where tensile strength is required. The growth in use for such products is indicated by the production figures for the metal. From 45 million pounds in 1914, output rose under wartime demand to 92.5 million pounds in 1918, dropped to 17.6 million pounds in 1922, and then rose to 110 million pounds in 1929. As a result of the depression it fell to 30 million pounds in 1932 but rose to 275 million pounds in 1944.

About the close of the last war, the British-American Nickel Company began the operation of mines and smelter in the Sudbury district, and a copper and nickel refinery was built at Deschenes, Quebec. This operation was not successful and the property was closed down and went into liquidation in 1924. In 1926 the Falconbridge Nickel Mines, Limited began operations, with a smelter at the mine and a refinery at Kristiansand, Norway. The refinery fell into the hands of the Germans when Norway was overrun and the International Nickel Company has treated the ore from Falconbridge as well as from its own mines.

Canada occupies a unique position in regard to the supply of nickel and its expanding use for peacetime operations should coincide with development of the study of alloys where its properties would be of most benefit.

No. 174. Fri. Mar. 23, 1945 -- The Dogfish

Formerly regarded by the fishermen of both Canadian coasts as nothing better than a nuisance, dogfish have taken on substantial value in British Columbia in comparatively recent years, first as raw material for some of the plants manufacturing fish meal and industrial fish oil and, more lately, because their liver was found to have high Vitamin A potency. In 1943, for instance, the marketed value of British Columbia's dogfish products was over $2,100,000, with vitamin liver oil accounting for more than $2,000,000 of the total amount. It happens, however, that through one of Nature's quirks the liver of the Atlantic dogfish has much lower vitamin content than the Pacific liver and there has been little profit incentive to use it as a source of vitamin oil. For that matter, though in this case not because of any differences in the make-up of the dogfish of the two coasts but because of other conditions, the production of dogfish meal and industrial oil on the Atlantic coast is also small-scale, as compared with British Columbia operations.

Neither the Pacific nor Atlantic dogfish grow to large size. Save perhaps in exceptional cases the maximum length is, say, three feet, or three and a half but, on the average, the fish runs between two and three feet. Individuals weighing as much as 15 pounds may occasionally be taken, but half that weight would be much nearer to the average, probably somewhat above the average. Picked Dogfish are slender in form, with two dorsal or back fins, each of these fins carrying a sharp spine in front; there is no anal fin. The fish are slate-coloured above, or perhaps brownish, and on the under side the colouring is white or grayish. When young the fish are marked along the sides with small white spots, which usually disappear, or fade, with time. The Pacific dogfish are similar to the eastern species in structure, though their fin spines are placed lower. The body colouring is gray, with the fins edged in black. White spots are present on the back of the young fish.

Picked Dogfish occur along practically all parts of the Dominion's Atlantic coast. For that matter, one authority spoke of them as "found everywhere on the coast of North America, from the Delaware to Davis Strait". Across the ocean they are common off the British Isles and in other European areas. The California Dogfish range from the Aleutian Islands to California.

Dogfish are edible fish -- indeed, in Britain they are much used in shops selling fish-and-chips, though they are then usually spoken of as "flakefish" -- but in North America they are not marketed for human food. Until the liver secret of the Pacific species was discovered, the only two uses made of dogfish in Canada were in the manufacture of fish meal and industrial oil, and production of this kind still goes on, mainly in British Columbia. Broadly, the manufacturing process consists in cooking the flesh, squeezing out the oil from the cooked mass by means of a pressure apparatus of one kind or another, and drying and grinding the solid residue as meal. The big dogfish business nowadays, however, is in the Pacific livers and the extraction from them of the oil rich in Vitamin A. In 1943, for example, British Columbia's fishermen landed nearly 4,570,000 pounds of dogfish livers and were paid for them close to $1,108,000. Vitamin oil produced in the province from dogfish livers totalled almost 3,510,000 pounds.

No. 175. Sat. Mar. 24, 1945 -- Marine Weeds Make Money for Dominion

Weeds may be nuisances in gardens but some of them are worth well over a hundred thousand dollars a year to Canada. These dollar-makers, however, are sea weeds, not the kind which spoil the gardener's temper. Among them are dulse, Irish moss, kelp, and several others which are commonly grouped loosely together under the general name of "seaweed". Sometimes too, eel grass comes into this reckoning and is used in the manufacture of insulating and upholstering material, though little or none of it has been harvested in recent years, thanks largely to a plant disease which destroyed most of this grass growing along the North American coast.

Another marine plant likely to be added to the list of commercial products in the Dominion in the near future is one known scientifically as "Gracilaria", which is a source of the jelly-forming carbohydrate known as agar or, sometimes, agar-agar. Up to the present all of Canada's harvesting of sea weeds has been done by Atlantic Coast fishermen but "Gracilaria" has turned up in British Columbia waters. Studies and experiments regarding it are going on at the Pacific Fisheries Experimental Station, which is operated at Vancouver by the Federal Fisheries Research Board. Agar, a substance of gelatinous consistency, is used in the preparation of some foodstuffs, in media for bacteria cultures, and in several industrial processes. Supplies of it for this part of the world were formerly imported from Japan, though as a matter of fact "Gracilaria" occurs in some Gulf of Mexico areas.

Canadian production of Irish moss, a plant which is used in the food, textile, and beer industries and also serves a number of other purposes, has expanded a good deal in the past few years, largely as a result of work done by the Fisheries Research Board when the war cut off European moss supplies. The moss is harvested in Prince Edward Island and several parts of Nova Scotia and the total quantity handled runs to a million pounds or more annually. Much the greater part of the Dominion's total marketed value returns from the business in marine plants comes from the trade in Irish moss.

Of the other sea weeds landed commercially from Canadian waters dulse is sold in the dried form for food purposes, though not a great deal of it is marketed -- say 50 or 60 thousand pounds a year, dried weight. High in iodine content, it is harvested mainly in Bay of Fundy areas of New Brunswick and Nova Scotia.

Up to the present Western Nova Scotia has been the only part of Canada where kelp has been gathered commercially. Most of the landings are shipped green, to the United States where they are used in manufacturing some chemical compounds. Harvestings of some mixed sea weeds in Nova Scotia are used chiefly in the production of sea-weed meal.

No. 176. Sun. Mar. 25, 1944 -- Mineral Production of Canada in 1944

The mineral production of Canada in 1944 was valued at $485,924,000, according to preliminary figures released by the Dominion Bureau of Statistics, as compared with $530,054,000 in the preceding year. The reduction was principally in the metals group. The total value of all metals produced was $307,572,000, a decrease of 14 per cent or $49,241,000. On the other hand, the total value of fuels, which include coal, natural gas, crude petroleum and peat, increased seven per cent to $99,375,000. This was mainly accounted for by the increased price of coal. Production of industrial minerals was valued at $37,629,000 as compared with $38,717,000 in 1943. Structural materials showed little overall change also, the estimated value in 1944 being $41,348,000 as compared with $42,010,000 in 1943.

From a value standpoint, gold continues to be the most important mine product of Canada. Owing to shortage of labour and restrictions placed on supplies and equipment, gold production continued to decrease, the output in 1944 being 21 per cent below the preceding year, and was the lowest since 1931. Notwithstanding this reduction, considerable prospecting activity was evidenced. The 1944 gold output was recorded at 2,685,474 fine ounces valued at $111,090,749 as compared with 3,651,301 valued at $140,575,088 in 1943.

Copper production reached an all-time peak in 1940. Since that year there has been a gradual reduction, due, in large part, to the shortage of labour. Output in 1944 amounted to 547,943,586 pounds valued at $65,357,050 as compared with 575,190,132 valued at $67,170,601 in 1943; nickel output amounted to 275,213,106 pounds valued at $69,279,061 as compared with 288,018,615 valued at $71,675,322; zinc production totalled 561,072,538 pounds valued at $24,126,119 as compared with 610,754,354 valued at $24,430,174; lead output amounted to 301,073,919 pounds valued at $13,548,327 as compared with 444,060,769 valued at $16,670,041; silver production amounted to 13,586,502 fine ounces valued at $5,842,196 as compared with 17,344,569 valued at $7,849,111; platinum output totalled 155,700 fine ounces valued at $5,994,450 as compared with 219,713 fine ounces valued at $8,458,951 in 1943.

The coal situation in Canada in 1944 was marked by a further drop in production and by a decrease in the number of mines. Coal mine labour continued to be

the determining factor in production. Production in 1944 amounted to 17,118,008 short tons valued at $71,214,305 as compared with 17,859,057 valued at $62,877,549 in 1943. Petroleum production amounted to 10,071,100 barrels valued at $16,250,200 as compared with 10,052,302 barrels valued at $16,470,417 in 1943.

Canada is the greatest producer of asbestos in the world. The mines are situated in the Eastern Townships of Quebec and have been in operation since 1878. Production in 1944 amounted to 420,880 tons valued at $21,599,787 as compared with 467,196 tons valued at $23,169,505 in 1943. Shipments of iron ore, beneficiated siderite, by the Algoma Ore Properties, Limited, a subsidiary of the Algoma Steel Corporation, Limited, continued in 1944. Also, one of the outstanding mining events of the year 1944 was the commencement of shipments of iron ore by the Steep Rock Iron Mines, Limited. Production of pig iron in Canada in 1944 amounted to 1,852,628 short tons as compared with 1,758,265 in 1943, and of steel ingots and castings 3,024,410 short tons as compared with 2,996,978.

No. 177. Mon. Mar. 26, 1945 — Estimates of Food Consumption in Canada

Estimates of food supplies moving into civilian consumption in Canada in 1944 do not show any material changes from 1943 except in the case of fruits and vegetables where better than average crops together with greater imports resulted in the substantial improvement in per capita supplies. The 1944 levels of consumption are, for most items, appreciably higher than before the war although there was some decline in the rationed commodities, particularly sugar and, to a lesser extent, butter. The figures indicate, therefore, that despite the substantial contribution that Canada has been making to the food supplies of Britain and other United Nations, agricultural production in Canada has been sufficient to meet these demands and at the same time provide additional supplies for our own civilian population.

Consumption of dairy production, other than butter, has increased continuously throughout the war period and supplies of fluid milk were in 1944, 120 per cent of the average of 1935-39. Cheese consumption, although still relatively small in Canada, shows an increase of 18 per cent over pre-war. The average for all dairy products converted to a milk solid basis was 120 per cent of the pre-war level.

Meat consumption in 1944 was slightly lower than in the preceding year but 126 per cent of the pre-war average. The reduction from 1943 occurred almost entirely in beef which dropped from 69.3 pounds per capita to 61.7 pounds. Slight increases are recorded for other categories of meat excepting the canned product which dropped from 2.3 pounds to 2.1 pounds per capita. The consumption of all meats on a carcass basis totalled 149.1 pounds in 1944 as compared with 155.5 pounds in 1943 and the pre-war average of 118.4 pounds.

Some reduction in supplies of both fresh and canned fish in 1944 resulted in a reduction in the total supplies of poultry and fish available to consumers from 31.4 pounds in 1943 to 29.0 pounds in 1944. The comparable figure for 1935-39 was 26.0 pounds. Consumption of eggs has increased steadily throughout the war period and in 1944 averaged 36.4 pounds or 24.3 dozen per person as compared with 35.3 pounds in 1943 and 30.7 pounds before the war.

Although lard, shortening and other oils and fats were in reduced supply in 1944, final figures on butter consumption indicate an increase of two pounds per capita in this commodity with the result that the 1944 estimate of the fat content of total oils and fats was 41.0 pounds as compared with 43.3 pounds in 1943 and 41.4 pounds in the pre-war period. Supplies of refined sugar entering civilian consumption

in all forms were somewhat higher in 1944 than in 1943 and, when included with the sugar content of maple and other syrups, honey and molasses, resulted in a total consumption of sugars of 95.6 pounds for 1944 compared with 87.6 pounds in the preceding year and 104.0 pounds in 1935-39.

Better than average crops on increased acreage of fresh fruits and vegetables resulted in sharp increases over the preceding year and over the pre-war figures. Total consumption in pounds of tomatoes and citrous fruits amounted to 109.3 in 1944 as compared with 58.8 before the war. Similarly the supplies of other fruits increased from 80.2 pounds before the war to 90.8 pounds for 1944. Similar increases are recorded for all classes of vegetables. The estimate of flour consumption indicate a decline from 1943 to 1944 although in making these estimates it has not been possible to adjust for changes in stocks of flour in the hands of wholesalers or retailers. Supplies of both tea and coffee improved in 1944 as compared with the preceding year. Coffee supplies were substantially higher than before the war although those of tea are still 17 per cent below the pre-war average.

No. 178. Tues. Mar. 27, 1945 -- Menace of Rats

Of the many reasons calling for the ruthless extermination of rats, the dissemination of the bubonic plague by rats is the most urgent. In the 14th century, this plague, known as "The Black Death", devastated Europe, taking the lives of 25,000,000 people, or a fourth of the total population. Since the discovery that bubonic plague is transmitted to man by fleas from rodents and that its spread can be stopped by exterminating the rat, it is not the awesome disease it once was, although the death rate is still tremendous in Indian and certain other countries.

The present pandemic started in India in 1894 and spread to all continents and to nearly every country of the world. From 1898 to 1925, there were 10,822,331 deaths from plague recorded in India. On several occasions, there have been outbreaks of plague in the United States, notably at San Francisco in 1907, New Orleans in 1914 and Galveston in 1920. Because the role of the rat was known, these outbreaks were soon got under control. In all about 450 people died.

In the first outbreak at San Francisco in 1900, the plague was contracted by ground squirrels and before this fact was discovered the disease was transmitted to other animals, and became endemic to such an extent that it has not been possible to eradicate it. Under this form, known as the sylvatic plague, it has been identified in rats, ground squirrels, wood rats, deer mice, and woodchucks in 10 of the Western States. Sylvatic plague is not so highly contagious to man, but there is a menace in the ever-present possibilities that house rats may become reinfested in the population centres and that human cases of bubonic plague contracted from native rodents may develop the secondary form which is highly contagious directly from person to person. Where there are rats, the danger exists.

No. 179. Wed. Mar. 28, 1945 -- Facts of Interest from Bureau Records

The use of asbestos can be traced back to ancient times. It was used for wicks in the lamps of the Vestal Virgins, and as a cremation cloth by the Romans. Later, in the reign of Peter the Great, a factory was established in Russia for the manufacture of asbestos articles. Chrysotile, the finest asbestos, was discovered in the Province of Quebec about 1862 and the mineral was first produced commercially in Canada in 1878 from the serpentine formations of the Thetford area in the Eastern Townships. The Canadian deposits are the largest known in the world.

Asbestos enters into a great variety of products, including brake lining, clutch facings, packings, cloth, insulation, millboard, siding, shingles, roofing, tile and pipes. In 1944 the production in Canada amounted to 373,000 tons, according to preliminary totals.

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The manufacture of baskets is one of the oldest of all handicrafts. The ancient Israelites used baskets in offering sacrifices, the early Britons were skilled in basketry and the Chinese have for ages produced baskets of great beauty. The Indians of the Americas reached a high degree of proficiency in the art. To-day basketry holds an important part in educational work. It is taught in practically all schools where manual training has been introduced and has proven an admirable industry for the aged and disabled, especially the blind. Canadian production of baskets and crates for fruit and vegetables were valued at $1,350,000 in 1942.

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The making of carpets is an art which belongs to remote antiquity. The Egyptians and Babylonians used them not only as floor coverings but also as covering for walls and tables. Beautiful carpets were also made by the Assyrians, Persians, Chinese and Indians. The conquests of Alexander the Great resulted in carpets being introduced into Greece as spoils of war, and the Crusaders brought carpets home with them to Italy, France and Spain. Eleanor of Spain, when she married Edward the First, took carpets and rugs to England with her, but it was Queen Elizabeth who brought them into general use. Her adventurous traders, scouring the seas for cargoes, found them profitable. Most of the carpets and rugs used in Canada are manufactured in the Dominion and the output in 1942 had a factory value of about $6,219,000, according to the General Manufactures Branch of the Dominion Bureau of Statistics.

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No. 180. Thurs. Mar. 29, 1945 -- Facts of Interest from Bureau Records

In Canada for many years breadmaking was for the most part a domestic art, but with the development of towns and cities the baking of bread gradually passed from the domestic circle to the family baker. This continued for a long period, until at the beginning of the present century, a new phase was marked. With the advent of mechanical power and automatic processes, also the improvement in transportation, the bread industry has made rapid progress within the last decade. The per capita consumption of bakers' bread in the Dominion in 1926 was 82.8 pounds, increasing to 90.1 in 1938, to 92.7 in 1941, and to 105.4 in 1943 in which year a new high point was reached.

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Although the production of concentrated milk is less important than that of butter and cheese, the establishment of condenseries and dry-milk plants opened an outlet for milk that has proved of great benefit to farmers in the areas served by these factories. The first condensery was built at Truro, Nova Scotia, in 1883, and the 1901 Census of Canada reported four condenseries in operation. The number increased to 11 during the course of the next ten years and 14 establishments were reported by 1915. The industry is now centred in Ontario, where the greatest volume of surplus milk is available and where 19 of the 26 plants now operating in Canada are located. In addition, about 64 plants, including a large number of creameries, use surplus milk in the making of powder, principally skim-milk powder and buttermilk powder. The most important whole milk products are evaporated milk, condensed milk, and whole milk powder.

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Flour milling is one of Canada's oldest industries. The first flour mill in Canada was built at Port Royal, now Annapolis, Nova Scotia, in 1607. It was here, too, that the first wheat to be grown on Canadian soil was harvested in 1605. With the coming of the United Empire Loyalists to Upper Canada to found a settlement at Kingston in 1784, we find a record of a mill being built on the Great Cataraqui River. By 1830 the industry had become firmly established with 393 mills in Lower Canada and 319 in Upper Canada. The subsequent history of the industry was greatly influenced by an important technological improvement, the adoption of steel rollers in place of millstones. This invention permitted a lowering of production costs by increasing the size of plant with the result that many of the smaller mills either had to close down or continue as chopping mills. The 200 mills which reported to the Dominion Bureau of Statistics in 1944 had an estimated capacity of 92,519 barrels per day.

No. 181. Fri. Mar. 30, 1945 -- Facts of Interest from Bureau Records

The kinds of stone quarried in Canada include granite, limestone, marble, sandstone, and slate. Stone of almost every known variety occurs in Canada; rocks of the igneous areas of British Columbia, Manitoba, Ontario, Quebec and the Maritime Provinces exhibit a wide range of physical characteristics, some varieties being especially noted for their richness of colour and beauty of crystallization. The sedimentary rocks, including limestones, sandstones and marbles are quarried at various points in Canada. The products from quarries operating in these different formations not only yield high class structural and decorative materials but provide the chemical and other allied industries with many of their increasing requirements. The gross value of all varieties of stone produced in Canada during 1944 totalled $6,780,000, according to preliminary figures.

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Rope-making is a very ancient industry. Constant references to it are made by writers of early times, and pictorial diagrams of the industry are found in early Egypt. Until the 19th century, ropes were labouriously made by hand, although the first rope-making machine was invented in 1792. The first machine was used in England industrially in 1820. The materials used in the manufacture of rope and cordage are hemp, jute, coir, cotton, flax, sisal, manila, and New Zealand fibre, and for the most part the fibres are spun into yarn in a similar way to that in which cotton is spun. The needs of war are reflected in the production of rope in Canada in recent years, the total advancing from 8,200,000 pounds in 1939 to 18,500,000 pounds in 1943.

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Writing ink is one of the manufactures in daily use today which reached a high degree of perfection long before our time. The use of ink dates back to the era following the invention of writing. The earliest writing inks consisted of a mixture of lampblack with a solution of glue or gum. The transition from carbon inks of the Eastern type into the modern inks took place very gradually. Pliny, Vitruvius and other classical authors mention writing inks, and old manuscripts show that its manufacture had reached a high degree of perfection in the Middle Ages. Most of the ink sold in Canada is manufactured in the Dominion, the output in 1942 amounting to 666,000 pounds valued at $412,000.

No. 182. Sat. Mar. 31, 1945 -- Facts of Interest from Bureau Records

The axe is the symbol of pioneering. The first settlers landing in America were met with the task of clearing the land, building log cabins, fashioning crude furniture and literally hewing homes for themselves out of the virgin forest. They

used the axes with straight cutting edges and straight helves or handles that are still used in many parts of Europe. Following the pioneers, and largely recruited from their ranks, came the lumbermen and later the pulpwood operators, and the axe changed its form to meet each new requirement. The woodsman's axe is probably the most universally useful of all the tools man has adapted to his use down through the ages. It takes the place of a whole chest of carpenter's tools. With it an expert can do almost anything with wood, from felling a tree to sharpening a pencil. More axes were produced in Canada in 1943 than in any other year for which statistics are available, the total in that year having been 787,000 as compared with 403,000 in 1939, 562,000 in 1930 and 672,000 in 1920.

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Replacing the horse-car systems used in Montreal and Toronto as early as 1861, electric street railways were first seen in operation in Canada in 1885, when a successful experimental railway was constructed and operated at the Toronto Exhibition Grounds. The first electric railway line in Canada and probably the first in North America, which ran between Windsor and Walkerville, was established early in June, 1886. The era of the horse-drawn street car was definitely ending. The growth in street car traffic within the half century has been rapid, reaching a peace-time peak in 1929 when the number of passengers exceeded 833,000,000. There was a heavy drop during the worst of the depression years. The war years, however, have witnessed a tremendous growth in the passenger traffic of electric street railway systems, and in 1943 the number carried was 1,177,000,000 -- an all-time record. In several municipalities the electric street car has been displaced by motor buses, and practically all street railway companies operate motor buses and trackless trolley buses in conjunction with their electric street cars.

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Dentistry in Canada prior to 1867 had no organization and no standard of qualification. Dentists began to practise after a short period of study. To-day, the minimum period of training is five years. Ontario was the first province to establish professional qualifications and in 1875 a school of dentistry was founded in Toronto. There are now five dental schools in Canada, and in recent years the annual average number of graduate dentists has been in the neighbourhood of 100. The 1941 census recorded a total of 4,210 dentists in Canada, of whom 4,165 were men and 45 were women.