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PULP AND PAPER IN CANADA

HISTORY

The welfare and activity of the pulp and paper industry, Canada's largest manufacturing industry, has a direct effect on the economic well-being of the entire country. The manufacture of pulp and paper is a comparatively recent development in Canadian industry. Prior to 1860 no woodpulp was used or produced. Rags, straw, esparto grass, cotton waste and other substances were the materials that went into the production of paper.

The first wood-grinder to manufacture woodpulp was installed at Valleyfield, Quebec, in 1866. During the same year the first Canadian chemical woodpulp mill was constructed at Windsor Mills in Quebec. In the next decade the use of woodpulp in paper-making expanded, and in 1887 the first Canadian sulphite mill was established in the Niagara Peninsula.

By the beginning of the 20th century the annual output of the industry had exceeded \$8,000,000 in value. Gross production steadily increased up to the boom years after World War I when the production peak jumped to more than \$232,000,000 in 1920.

There followed a slump period in 1921, after which there was a steady recovery. The industry's second peak was reached in 1929 with an output valued at \$243,970,761. This peak was followed by annual decreases until 1933, then annual increases to 1937. The following table lists the gross value of production and represents the sum of the values of pulp made for sale in Canada, pulp made for export and paper manufactured:

GROSS VALUE OF PRODUCTION OF THE PULP AND PAPER INDUSTRY

1929	\$ 243,970,761
1930	215,674,246
1931	174,733,954
1932	135,648,729
1933	123,415,492
1934	152,647,756
1935	159,325,546
1936	183,632,995
1937	226,244,711
1938	183,897,503
1939	208,152,295
1940	298,034,843
1941	334,726,175
1942	336,697,277
1943	345,653,470

BACKGROUND OF THE INDUSTRY

Rapid development of the pulp and paper industry is due principally to the existence in Canada of abundant water power adjacent to extensive forest resources of pulpwood, coupled with an increasing demand for newsprint in the international market. Canada's vast fresh water areas situated above sea level afford a capacity for great hydro-electric power.

The pulp and paper industry has contributed substantially to the development and use of power resources. Without a plentiful and cheap supply of hydro-electric power, pulp and paper could not be manufactured on its present scale. The installed capacity of Canadian hydro-electric stations is 10,214,513 horse-power a year. Prior to the war the pulp and paper industry ordinarily purchased 50% of all Canadian power sold for industrial purposes.

Canada's total forest area ranks third in the world - only the Soviet Union and Brazil have greater forest possibilities. There are 783,000,000 acres of forest land which comprise more than 35% of Canada's total land area. About 493,000,000 acres of this forest is considered accessible and capable of producing continuous crops of timber for domestic and industrial purposes. More than nine-tenths of all the forests in Canada belong to the public and are known as crown forests.

In the Northwest and Yukon Territories and in national parks and forest experiment stations, the forests come under federal jurisdiction; all other crown forests are administered by the provincial governments. The size of the organization necessary to manage the forests in a province is largely governed by the extent of the forested land and by the way in which ownership is distributed between state and private holdings. Of the occupied forested land in Canada 37% is privately owned - corporation and other private businesses account for 20.8%, and farm woodlots comprise 16.2%. The remainder of the occupied forested land, 63%, is state-owned and is licensed to three industries - the pulp and paper industry has licenses for 48.8%; saw timber licenses run to 13.5%, and timber sales and permits run to 0.7%.

The number of farm woodlots in Canada is between 400,000 and 500,000. As a general practice, farmers harvest their own timber from these woodlots and in turn sell the raw material to the manufacturers. From this class of producers comes a substantial part of the annual supply of pulpwood and logs for the mills. The pulp and paper industry pays annually from \$10,000,000 to \$15,000,000 to farmers and settlers for pulpwood.

CAPITAL INVESTED IN THE INDUSTRY

Capital invested in the pulp and paper industry at the outbreak of war was \$597,908,918, about triple the amount of the next ranking manufacturing industry in Canada, that of non-ferrous metal smelting and refining. By 1943 the industry's capital investment had grown to \$667,458,000. This investment represents an ownership by many thousands of Canadians. Total wages and salaries of the pulp and paper industry are the largest paid in Canada apart from direct war industries. Including woods operations, pulp and paper mean employment for nearly 150,000 workers and represent direct livelihood for about 500,000 of Canada's estimated 11,800,000 population. The industry also supports many more thousands as a chief contributor to rail and water traffic and as a big purchaser of domestic supplies and equipment. Some outstanding annual disbursements made by the pulp and paper industry to normal Canadian economy are:

Transportation	\$60,000,000
Taxes	30,000,000
Hydro-electric power	20,000,000
Pulpwood from farmers and settlers.....	18,000,000
Chemicals.....	14,000,000
Fuel.....	13,000,000
Food supplies.....	7,000,000

CANADIAN PULP INDUSTRY'S WAR PROGRAM

The furtherance of the war effort has been the basis of the pulp and paper industry's wartime policy. Although the Canadian industry during the war years has been virtually the only source of export supply for the democratic nations, the Canadian manufacturers have refrained from taking advantage of their unusual position. Since the outbreak of war the industry's foreign trade has provided Canada with more exchange than any other industry, particularly much needed United States dollars. Newsprint alone annually brings to Canada foreign exchange in excess of \$150,000,000. Through foreign trade many thousands of tons of pulp and paper shipped across the southern border to the United States make possible the purchase of war supplies there by Canada.

In pulpwood production, despite the handicap incurred through the wartime program, the industry has exceeded the peak of the five pre-war years (747,000,000 cubic feet in 1937) by a considerable amount. The average production of the five war years is estimated at 831,000,000 cubic feet; average for the 1935-1939 period was 623,000,000 cubic feet. This increased figure has been accomplished through skilful use of the materials of production. Not only has Canada's demand for pulpwood to provide war supplies of pulp, newsprint and other products increased, but in addition the United States market has received a 25% greater delivery of Canadian pulpwood to support the operation of mills in the United States.

PULP USES IN WAR

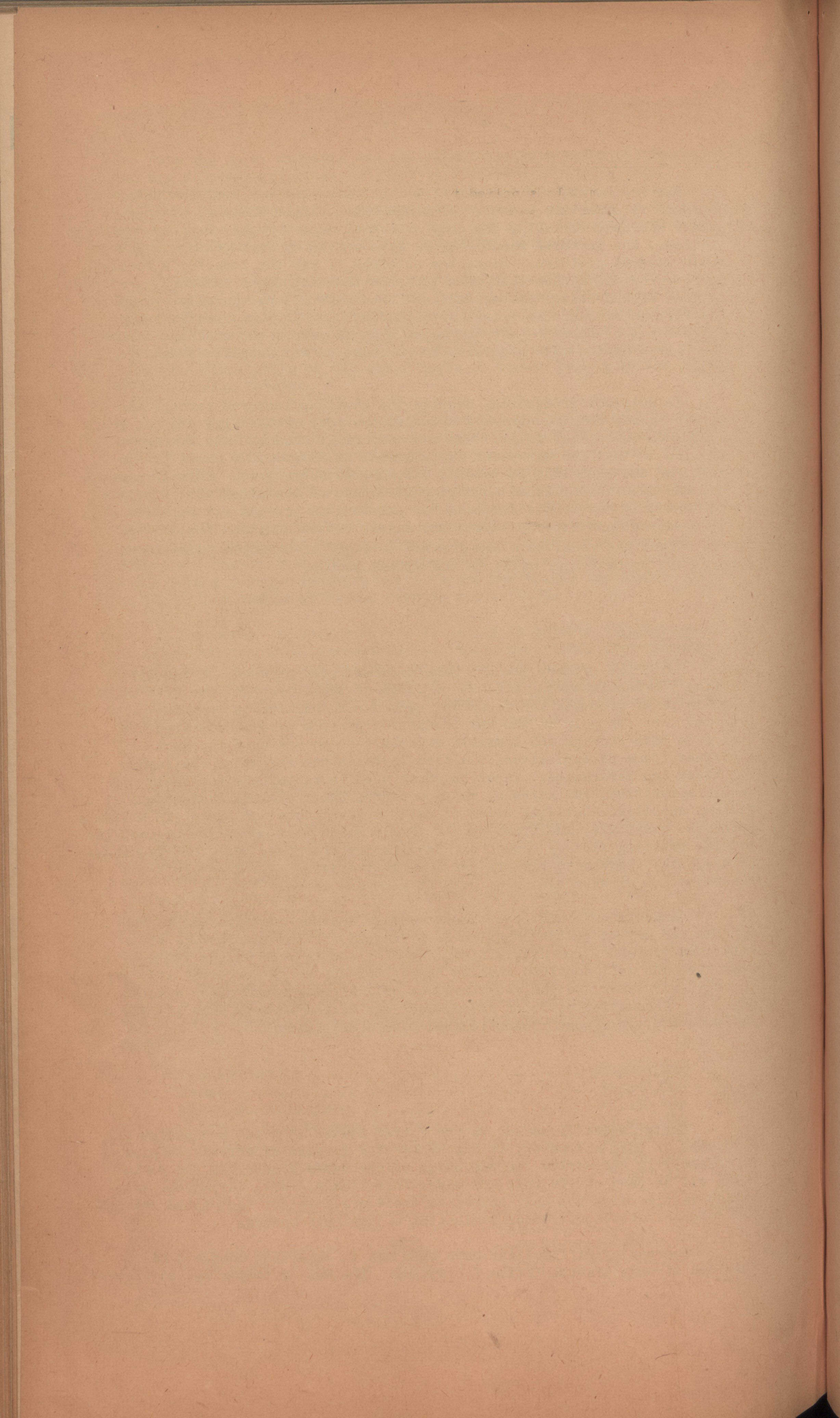
Pulp, the primary product manufactured from pulpwood, is the basic material for manufacturing all the products of the industry. The need of pulp and paper products for essential uses during wartime is very heavy. Extended uses for pulp in the war production program have accelerated the demand in both foreign and domestic markets. Pulps are used for such important items as explosives, plastics, substitutes for metal and rayon for tires and parachutes. Paper board is used in containers for shell cases, ammunition, gun barrels, machine parts, blood plasma, food and medical supplies. Building board is used to substitute for lumber in building barracks, hospitals, munitions works. Paper other than newsprint is used for towels, printing Victory bonds, War Savings certificates, maps, charts, blueprints, etc. Newsprint has its own important mission - to maintain the dissemination of essential news both at home and abroad.

Canada's pulp and paper industry made another contribution to the general war effort by the adoption of a program for the manufacture of "bits and pieces." The diversified list of products made in the industry's extensive and well-equipped machine shops includes parts for naval and cargo vessels, airplanes and gun mountings, as well as gauges and other special devices. Production of "bits and pieces" was valued at more than \$1,250,000 in 1941, and subsequent production has been much greater.

PULP

While Canada is second to the United States in total production of all forms of pulp and paper, it has by far the largest exportable surplus of any country in the world. In peacetime nearly every country in the world draws all or part of its pulp and paper from Canada. Now, during the war, Canada is virtually the only source of these products for the United Nations and other countries not under domination of the Axis powers.

Increasing difficulties have been met in obtaining adequate rail, ship and highway transportation facilities. The United States market absorbs



annually virtually all of Canada's pulpwood exports, more than 80% of its pulp and about three-quarters of its paper shipments. About half of the paper consumed in the United States is either of Canadian manufacture or is made from wood or woodpulp imported from Canada.

In pre-war years Scandinavia had been the principal exporter of woodpulp in its primary form. It supplied the United Kingdom with 2,000,000 tons a year and the United States with nearly 1,500,000 tons a year. At the time, Canada's pulp exports to these markets were comparatively negligible. With the shutting off of European pulp supplies, Canadian pulp manufacturers were faced with the urgent responsibility of supplying these British and United States requirements. In the span of six years Canadian exports of pulp have increased 285%. Pulp exports in 1938 amounted to 559,000 tons; by 1943 Canada was exporting 1,581,000 tons of pulp. The United Kingdom's wartime supply of pulp has been restricted to 20% of normal consumption, but Canadian deliveries to the United Kingdom have increased from 72,000 tons a year in 1938-39 to 273,000 tons in 1943. The United States annual supply of pulp from Canada increased from 454,000 tons in 1938 to 1,280,000 tons in 1943. Taken in conjunction with Canada's own great wartime need for pulp, the following table displays a remarkable achievement by the Canadian industry in meeting the two-fold emergency of the domestic and foreign markets:

EXPORTS OF WOOD PULP
(thousands of tons)

	To United Kingdom	To United States	To Others	Total Exports
1938	73	454	32	559
1939	72	607	26	705
1940	176	825	67	1,068
1941	266	1,109	37	1,412
1942	294	1,197	19	1,510
1943	273	1,280	28	1,581

NEWSPRINT

Total newsprint deliveries by Canadian mills in the war years show that normal pre-war supply has not only been maintained but has been surpassed by 225,758 tons a year. The pre-war average has been beaten in each of the five war years, including a 1944 estimate. Despite wartime operating handicaps, Canadian newsprint mills have made deliveries of more than 1,250,000 tons of additional supplies. More than 40 countries throughout the world have been able to sustain a free press during these five war years as a result of the management of Canadian newsprint mills.

However, severe curtailment of supplies for the United Kingdom, Australia and other overseas consumers was experienced because of the shortage of shipping space, particularly in 1942 and 1943. Canadian tonnage for overseas consumers in 1944 is still 14% less than the pre-war average.

For United States consumers Canadian mills have more than filled the gap caused by loss of the Scandinavian tonnage. Because of overseas curtailments of Canadian exports, the United States has had an increased share of Canadian supply. In the five war years United States consumers have received from Canada an average of 2,625,010 tons of newsprint a year. United States peacetime consumption took 76% of Canadian exportable supplies of newsprint. The wartime average is more than 81% of Canada's exports.

In 1944 Canadian tonnage of newsprint for United States consumers has fallen below the wartime average, but it is still greater than the peacetime export average. The decreased United States supply results from improved shipping facilities which are assisting to restore deliveries to overseas consumers.

CANADIAN NEWSPRINT DISTRIBUTION
(thousands of tons)

<u>To United States</u>		<u>To Canada</u>		<u>To Others</u>		<u>Total</u>	
No. of tons	%	No. of tons	%	No. of tons	%	No. of tons	
1935-1939... average	2,286	76	192	6	525	18	3,003
1940	2,594	76	184	5	658	19	3,436
1941	2,770	80	197	6	488	14	3,455
1942	2,811	88	203	6	195	6	3,209
1943	2,550	85	193	6	267	9	3,010
1944 ^x	2,400	79	185	6	450	15	3,035
Wartime..... average	2,625	81	192	6	412	13	3,229

^xEstimated tonnage for 1944 by the Newsprint Association of Canada, Montreal, April, 1944.

WAR'S IMPACT ON THE INDUSTRY - LABOUR

The furtherance of the war effort has brought about highly important changes within the pulp and paper industry. Two factors combine to bring about the changes. One is the urgent need for more men for war industries and the armed services. The other - equally important - is the necessity of diverting part of the power used in pulp and paper manufacture to the production of munitions and other war materials.

Recruiting of manpower for woods operations has been by far the most critical problem facing Canada's pulp and paper industry in wartime. Early in the 1942 season officials of the industry announced a minimum shortage of 30,000 workers. They appealed to National Selective Service to declare it a "war-essential" industry and to allocate adequate manpower to cut the flourishing pulpwood stands. National Selective Service, realizing the difficulties of obtaining workers for woods work, took several steps to recruit workers who might otherwise not be available.

By relaxation of National Selective Service regulations, permission was granted to pulpwood operators to maintain recruiting agents in the field to work under supervision of the regional superintendents of National Selective Service. Men recruited by these canvassers are sent directly to their jobs, and formalities are reduced to a minimum. This permission to pulpwood companies to use their own experienced recruiting agents greatly facilitates this industry in obtaining the required manpower. Additional recruiting activities included an intensive campaign by newspaper and by radio advertising.

On October 31, 1943, Labour Minister Mitchell announced that an upward revision had been made in the labour priority of the pulp and paper industry by which it was placed in "B" category. "A" and "B" are the two highest Canadian priorities and include all war industries and essential civilian services. This system has made it possible to "ration" manpower according to priority and grant the most essential industries the highest rating. Being placed in a "B" priority, the pulp and paper industry is considered an essential industry and is allotted considerably more workers through the employment agencies of National Selective Service. One stipulation of the "B" priority rating which makes it attractive to seasonal workers is that no freezing regulations are applicable to men employed in woods operations. Pulpwood cutting is a seasonal occupation, and the majority of the woodcutters are farmers. If freezing regulations were applied to these farmers entering woods operations, they would be reluctant to leave their farms. The amended category has encouraged farmers to go into the bush in the winter months. The public employment offices of National Selective Service placed 71,000 men at woods work from September, 1942, to April 30, 1943. This was twice the number placed during the corresponding period of the previous season.

Additional aid in obtaining manpower for woods operations has been given by the government through allocating prisoners-of-war and Japanese to the woods. There are now more than 1,200 Japanese in woods operations, as well as 2,050 prisoners-of-war.

The following tables of employment statistics show how the foregoing actions have alleviated the shortages of manpower in the pulp and paper industry. Allowances must be made for seasonal fluctuations in operations.

EMPLOYMENT STATISTICS FOR PULPWOOD LOG PRODUCTION

<u>1943</u>		<u>1944</u>	
April	- 34,739	January	- 48,767
May	- 24,790	February	- 50,369
June	- 27,672	March	- 50,054
July	- 28,150	April	- 44,723
August	- 25,272	May	- 30,945
September	- 22,313	June	- 34,096
October	- 26,063	July	- 34,567
November	- 34,028	August	- 30,247
December	- 45,126		

EMPLOYMENT STATISTICS FOR PULP AND PAPER MANUFACTURING

<u>1942</u>		<u>1943</u>		<u>1944</u>	
January	- 36,913	January	- 34,595	January	- 35,871
February	- 36,933	February	- 34,312	February	- 35,676
March	- 37,148	March	- 34,344	March	- 35,680
April	- 37,342	April	- 34,761	April	- 35,576
May	- 37,198	May	- 34,820	May	- 36,042
June	- 37,926	June	- 36,291	June	- 37,136
July	- 38,576	July	- 36,939	July	- 37,958
August	- 38,484	August	- 38,278	August	- 38,804
September	- 38,623	September	- 38,244		
October	- 37,544	October	- 37,467		
November	- 36,214	November	- 36,792		
December	- 35,400	December	- 36,643		

HYDRO-ELECTRIC POWER

The pulp and paper industry is the largest peacetime user of hydro-electric power of any industry in Canada. During the war it has been called on to divert substantial blocks of power to the production of munitions and other war materials. Despite tremendous wartime developments of new power facilities in Canada, a considerable amount of mill capacity has been restricted or cut down. In 1942 the total power employed for all manufacturing in Canada was 6,063,020 horsepower. Early in 1941 the power controller instituted weekly shut-downs, staggered so that one mill would close on Sunday, another Monday, and so on, and thus prevent undue demand on certain peak days. The output of the industry proved its ability to meet the emergency shortage. Then in the latter part of 1944, power restrictions were removed.

CONTROLS OVER THE INDUSTRY

The outflow of pulpwood to the United States had reached record proportions by the beginning of 1942, but it was doubtful whether this production rate could be maintained. However, it was arranged that the United States mills, which normally depended on Canadian wood, could receive enough pulpwood to meet their ordinary requirements. During the year all business in woodpulp and paper was brought under the control of administrators of the Wartime Prices and Trade Board. The first newsprint administrator was appointed in December, 1941.

During the latter part of 1942, the hydro-electric power needs of munitions industries and other direct war production were so great that restrictions had to be placed on the amount of electric current available to newsprint mills in parts of Ontario and Quebec. This inevitably resulted in reduced output. To meet this situation a national plan was devised for curtailment of operations in the newsprint industry. A pooling scheme was planned whereby Canadian mills that had been compelled to surrender business through lack of power would be compensated from a fund to be built up from contributions by mills that were able to maintain or increase their output. This fund is administered by the Commodity Prices Stabilization Corporation of the War-time Prices and Trade Board.

In March, 1943, a joint statement was released in Washington by the United States Office of Price Administration and the Canadian Wartime Prices and Trade Board which pointed out that newsprint is one of the few commodities which had not, up to that time, increased in price since the outbreak of war. The standard price of newsprint had remained at \$50. a ton since 1938.

Quota arrangements covering operations of 25 newsprint manufacturers were put in effect in September 1942. The reduced rate of operations of the industry placed Canadian manufacturers in a difficult position, and they could no longer absorb the increased costs which war conditions brought about. As a result, in March, 1943, the ceiling on the selling price of newsprint in Canada was raised \$4 a ton, which conformed with an increase of the same amount concurrently announced in the United States. Donald Gordon, chairman of the Canadian Wartime Prices and Trade Board, pointed out that the increase of \$4 was much too small to cover increased costs in order to place the Canadian newsprint industry in a position to carry on at normal levels. Consequently an additional increase of \$4 a ton, effective September 1, 1943, was announced jointly by the Wartime Prices and Trade Board and the Office of Price Administration, Washington. This established a new ceiling for newsprint of \$58 a ton (U.S. funds at New York) which is the present ceiling.

Newly developed hydro-electric projects came into operation in the early summer of 1943, and these substantially eased the power situation, but no considerable increase in the output of paper seemed possible because of the shortage of labour and consequent shortage of pulpwood.

At the end of 1943 the Wartime Prices and Trade Board introduced new restrictions on the manufacture and use of pulp products and tightened those already in effect. Among these were the elimination of many non-essential products, maximum manufacturing specifications for others, quota rationing of newsprint and other products. As a result of these measures it was possible in December, 1943, to set production quotas for 1944 higher than would have been considered possible a few months earlier.

Newsprint production in 1944 is at a monthly rate of 252,000 tons, of which 200,000 tons are available to the United States. This is 9% more than in 1939. Exports of woodpulp to the United States during 1944 are at the rate of 1,100,000 tons a year. Under an arrangement between the Canadian timber controller and United States authorities, the United States receives one-half of Canada's production of pulpwood purchased outside of the timber interests of the pulp and paper companies. Exports of pulpwood to the United States in the past five years have been as follows:

1939	1,076,761	cords
1940	1,376,977	"
1941	1,649,537	"
1942	1,805,040	"
1943	1,408,363	"

POST-WAR TRADE POSSIBILITIES

The continued prosperity of the pulp and paper industry is dependent on export markets. The Canadian federal and provincial governments recognize

the need to obtain and hold these markets. The mills of Canada are advantageously located across the country near both Pacific and Atlantic seaboards and consequently are in a position to make economical deliveries to any part of the world. Through its ability to meet the ~~severe~~ test imposed on it during the last five years of war, the Canadian pulp and paper industry has demonstrated qualities of adaptability and reliability which, despite international competition, should be an assurance for its future.

The United Kingdom and the United States are the greatest importers of forest products. It is possible that other great markets may develop in South America or even in China. The demand for paper which would result if literacy became general throughout China is one interesting field for speculation.

Before the war Canada's principal competitors in the United Kingdom were the Scandinavian countries. The Soviet Union was also becoming a serious competitor. Scandinavian countries have the geographic advantage of a shorter haul to the markets of the United Kingdom. Russia may use its enormous timber reserves as an essential factor in export trade and has the competitive advantage of production by the state.

The American Newspaper Publishers' Association in a survey published at New York on November 1, 1944, predicts that paper and paperboard, which are credited with implementing military advances in Europe and the Pacific, will remain scarce for at least several months after victory. Liberated countries, particularly France and Belgium, are making demands on Canada for paper to enable them to restore civil government and a free press. Canadian pulp and paper manufacturers are already furnishing a substantial amount of paper to Italy. The United States publishers predict little or no relief for the United States in the extremely tight situation by imports of woodpulp from Scandinavian countries until several months after the war in Europe ends. The occupying military forces are now supplying necessary paper in the liberated countries, but requests for paper may soon be channelled through the United Nations Relief and Rehabilitation Administration. Neither Norway nor Finland will be in a position to supply much market pulp for considerable time after the European war ends, and Swedish pulp will be in demand by many countries besides the United States. Consequently no immediate relief is seen from the continued demands of the United Kingdom and the United States for Canadian pulp and paper.

FOREST CONSERVATION

One of the biggest problems recognized as a definite threat to the future of the pulp and paper industry is rapid forest depletion. Estimates made during the 10 years preceding the war show that the annual rate of depletion of reserves of merchantable timber was 3,623,000,000 cubic feet. Of this amount, only 70% was used, while 30% was lost through fires and other destructive agencies. The sub-committee on the conservation and development of natural resources of the Advisory Committee on Reconstruction in its report submitted in September, 1943 (James Report) presented evidence that the future welfare and prosperity of Canada depend in no small degree on the wise management and use of the most extensive renewable natural resource - the forests. The production of forest products on a stable and continuing basis will prove a main factor in the national economy.

The forest fire problem is the most serious obstacle in planning a program for forest management. The James report recommends that the Canadian government give assistance to provincial efforts in preventing depletion by forest fire.

The sub-committee maintains that progressive forest management is based on adequate knowledge of rates and conditions of growth of timber stands and the best means of producing the greatest quantity of high-grade raw material in the shortest time at the lowest cost. This information was said to be available only through planned silvicultural research which, it was stated, has a long-term element and is considered a function of government.

Road improvements are needed for efficiency and economy in the operation and protection of the forest. Successful practice of intensive forest management requires adequacy of research, experimentation, a sufficient number of managing personnel and suitable economic conditions.

These improvements would increase the cost of logging, but such an increase would represent a decided investment for the sake of the future wood supply of raw materials.

In a report presented to the 36th annual meeting of the Canadian Society of Forest Engineers it was submitted that a recognized detriment to the Canadian forest industries is their operation under the handicap of single-product production. Reorganization of the mills to utilize all raw products available from the forest would not only be effective in producing new commodities but would reduce waste and stabilize the industry, it was said. There are hundreds of thousands of cords of slabs resulting from sawmill operation which are now going to waste. These wasted slabs could be a steady source of raw material for the pulp and paper industry. Elimination of waste and the finding of uses for all the products of the forest present problems of paramount importance if the forest industries are to grow and prosper, say Canadian forest engineers.

The most recent developments in the newsprint industry in the United States show a tendency away from newsprint production to other more profitable pulp products. It is considered that wood cellulose is too valuable an asset to waste on producing newsprint - the most cheaply manufactured woodpulp product. The Scandinavian countries have also been concentrating on the production of higher grade pulps. Canada, too, is turning more to diversification in the newsprint industry. There are two yeast plants utilizing waste sulphite liquor at paper companies' plants at Liverpool, Nova Scotia, and Thorold, Ontario. Industrial alcohol made from waste liquor is also being produced at Thorold. Successful experiments have been made in Quebec with lignin extract as a stabilizing material in road construction. Lignin, a by-product of the pulp and paper industry which heretofore has been regarded as waste, increases the binding power of clay in road building.

In the field of fine papers, one eastern Canadian firm is supplying 95% of the United Nations' needs of vanillin from a product formerly allowed to go to waste. Production of cellulose plastics is still another field of diversification being developed. Consequently the future may prove that new commercial products, having greater value than newsprint, will substantially alter the position of the industry.

The sub-committee on the conservation and development of natural resources of the Advisory Committee on Reconstruction showed general agreement that to an important degree dependence will have to be placed on forestry work in meeting immediate post-war employment problems. As the productivity of the forests expands, so also will the production of the pulp and paper industry. To ensure that the forest resources and forest industries may be utilized to the greatest possible extent in supporting the Canadian economy after the war, the sub-committee suggests:

"The average Canadian has no firm understanding of his personal interest in the country's forest estate. One of the most important tasks awaiting immediate action is the development of a program of sustained public education to make the people of Canada forest conscious."