

The Pulp, Paper and Allied Industries of Canada



WRITING in the Toronto Globe on "The Pulp, Paper and Allied Industries of Canada," E. B. Biggar says:

In responding to the request for some facts concerning the pulp, paper and allied industries of Canada, I wish to congratulate the Globe on its campaign of education in favor of a new Canadian forestry policy. It is a statesmanlike idea and I am convinced that there is no movement the press can engage in which will have so profound an influence for good upon the material condition of the Canadian people in the future as this.

Of course the forestry problem is greater than any question involving only the fate of the pulp and paper trades, but in the development of our complex civilization the products of the pulp and paper mills form an element that grows more vital and more ramifying each year. Further than this, the position which Canada occupies as the possessor of over one-third of the water powers of the world, with a greater area of paper-making timber than is now left to the lot of any other nation, and as the home of a people unequalled for their skill in woodcraft, assures to our pulp and paper industries a pre-eminence which can be jeopardized by only one thing—our own failure to realize our opportunity.

To appreciate what the products of the pulp mills already mean to our industrial life and to what degree their importance will grow in the near future we have only to review the development of our neighbor nation, the United States. Although experiments had been made in the production of paper from cellulose, or wood pulp, as early as 1844 in Europe, and the process was introduced into the United States in 1854, the improvement by which it became commercially successful was not employed till 1867, and it only became a regular industry about 1870. At this date eight establishments were reported, whose combined annual product was worth \$172,350. Ten years later there were fifty establishments reported, with an annual product of \$2,256,946.

In 1880, in the days of rag paper, there were in the United States 443 mills, whose capital was \$7,260,864, and whose product was valued at \$10,187,177. By 1880 there were 742 establishments, with a capital of \$48,139,652, producing paper and pulp to the value of \$57,360,890, while in 1900 there were 763 establishments, comprising over 1,200 mills, with a capital of \$167,507,713, producing paper and pulp to the value of \$127,286,162, showing a remarkable expansion in the capacity of the mills and the value of their output. By 1905 the capital had again increased to \$277,445,471 and the value of products to \$188,715,189, while the mills paid out wages to the amount of over \$38,000,000. Besides this home manufacture there was imported into the United States for its own paper mills in 1905 pulp to the amount of 167,504 tons, valued at \$4,500,000, and of paper to the value of \$5,623,636 and paper stock \$3,796,595. The exports of American-made paper and manufactures of paper were \$8,238,088. This takes no account of the miscellaneous industries—growing in number every year—whose raw materials are paper and pulp in some form, and whose annual value of output would make a vast total.

From being made of rags and miscellaneous fibres, the course of the industry has been changed till nine-tenths of the paper is made of wood pulp, the spruce, balsam, poplar and hemlock woods forming the chief supply, not only for making paper but for the numerous articles that are now turned out from pulp, such as pulpboards, sheathings, and linings in structural work, leatherboard, pulp bottles, boxes and cases, indurated fibreware, moulded figures and designs for interior decorations, wall and floor coverings, wood flour, etc.

But since this revolution has been brought about in the paper industry of the United States and new uses for wood pulp are being announced every week in America and Europe the consumption of pulp-producing woods has increased till the people of the United States have awakened to the fact that the supply of pulp timber in most States is practically exhausted, while over the whole Union the consumption has far outstripped the reproductive capacity of the forests. Up till two years ago this was denied by those interested in certain departments of the American pulp and paper trade.

Now, when the mills in Wisconsin—planted in the midst of what was regarded as a perpetual supply—have had to import pulpwood to the extent of 70,000 cords during the past season, all the way from Quebec by rail, while some of the paper mills of Maine—the State of "inexhaustible" spruce limits—are getting supplies of wood from New Brunswick and Quebec, the American famine in pulpwood can no longer be denied.

The famine was inevitable, but, like most other famines, it was neither foreseen nor provided against by the average man concerned. In ten years after the introduction of the wood pulp paper process the price of news print was brought down from an average of 9 cents a pound to 4 cents, and since then the improvements in machinery and the increased capacity of the mills have further reduced it, till it is now sold at 2 cents a pound. This cheapening has, in turn, made possible the enormous increase in the size and circulation of the modern daily newspaper—one of the marvels of the age, and as fearful in its power for evil as grand in its possibilities for good to the world.

The increased demand for wood to maintain other industries, added to the remarkable development of the paper industry, explains the wood famine which is now giving the statesmen of the United States such concern, and explains why each year the United States is becoming more dependent on Canada for the raw material for its paper mills.

During the year ending June, 1907, the United States imported pulpwood from Canada to the amount of 650,366 cords, or enough to manufacture, say, 520,000 tons of news paper, while its imports of ground pulp from Canada were 149,827 tons, valued at \$3,230,272. Besides this it imported pulp from other countries, chiefly Norway, to the amount of 62,283 tons, valued at \$3,118,585, largely chemical pulp. These are official figures of the United States, but while the Canadian official returns show an export to the United States of 452,846 cords in the nine months ending March, 1907, or at the rate of over 603,794 cords for the year, it is the opinion of The Pulp and Paper Magazine that the actual quantity of pulpwood shipped to the United States amounts to from 800,000 to 1,000,000 cords per year. This opinion is based on the fact that the records of the cordage of exports of wood, which is not dutiable, are loosely kept; that large quantities go out of Canada from border streams, like those between Maine and New Brunswick, without any record, and large quantities go similarly unrecorded from remote shores of Georgian Bay and Lake Superior across the lakes.

According to a special report of the United States Census Bureau the consumption of domestic spruce wood used by United States pulp mills increased 47 per cent. in quantity, and 122 per cent. in price in the five years from 1900 to 1905, while the consumption of Canadian spruce wood by United States mills increased 102 per cent. in quantity and 150 per cent. in price in the same period. The average cost of wood used for mechanical and chemical pulp was more than doubled in the five years named, for every variety of pulpwood except domestic poplar. Canadian poplar had increased 176 per cent. If these percentages could be applied to the conditions in

1907 the increase would be still greater.

To illustrate the nature of the crisis towards which the United States is swiftly tending we may turn to the mills of New York State. This State has 108 mills, largely clustered in the north-eastern counties, accessible to the great spruce forests of the Adirondack Mountains. Twenty years ago the mills of Watertown, the chief paper-making centre, had supplies of pulpwood at their doors, and it was believed the timber would last forever. Now the source of home supply is eighty or a hundred miles away, and an increasing proportion of mills have to get their wood from down the St. Lawrence in Quebec or by rail from that Province at a distance of 200 miles or more. The mills of this State have a yearly capacity of 987,000 cords of wood, and on the basis of a growth of ten cords an acre they would strip nearly 100,000 acres a year, and if the lumber cut off this region (estimated in the census at 245,000,000 feet a year) is added, the whole spruce areas of the Adirondacks would be wiped out in seven years were these mills confined to their own State for raw material.

Unable to secure supplies at home, many United States papermaking concerns have recently bought large tracts of forests in Canada, the aggregate of these purchases in Quebec and eastern Canada already exceeding 25,000 square miles, while additions to these purchases are being made every month. The Union Bag & Paper Co., one of these companies, frankly explained to its shareholders, as the reason for reducing its dividends that it was necessary to acquire large bodies of timber in Canada "on account of the rapid increase in the market price of pulpwood, and the rapid disappearance of the spruce forests of this continent." According to The Wall Street Journal, The International Paper Co., which controls over thirty mills, has in a little over a year acquired 1,255,000 acres more of timber limits, most of them in Canada. As this country is the only source of wood supply outside its own borders it is apparent that if the export of pulpwood from Canada were cut off, the paper manufacturing industry of the Republic would collapse.

Let us now look at the situation at home. The first paper mill in Canada, says The Pulp and Paper Magazine, was started at Jacques Cartier, Quebec, by a Mr. Jackson, in August, 1800, and was in successful operation till 1857. The second mill was started at St. Andrew's, Quebec, in 1803, the same year in which the Fourdrinier machine, which was to revolutionize papermaking, was introduced into England.

According to the census of 1851, Upper Canada had five mills and Lower Canada had also five. The census of 1871 gave 12 mills to Ontario, 7 to Quebec, 1 to Nova Scotia and 1 to New Brunswick. The census of 1881 recorded 36 paper mills and 5 pulp mills.

The subsequent progress of the pulp and paper industry is recorded in The Pulp and Paper Handbook of Canada in the various editions as follows:—

Pulp Mills		
Year.	No. of mills.	Total capacity in tons per 24 hours.
1888	34	154
1892	37	154
1899	39	1,145
1907	58	2,361

The total capacity of the mills producing chemical pulp by the sulphite and soda processes in 1899 was about 500 tons per day, and in 1907 about 550 tons per day, so that the increase in the last eight years has been almost wholly in mechanical or ground wood pulp.

Paper Mills		
Year.	No. of mills.	Total capacity in tons per 24 hours.
1888	40	173
1892	38	209
1899	33	328
1907	46	966

The era of manufacturing pulp from wood in Canada began in the decade of 1880-90. The yearly capacity of its pulp mills at the present time is about 700,000 tons of pulp and 200,000 tons of paper. Pulp first figures in the trade and navigation returns of Canada in 1890, when the total export was valued at \$168,180, of which \$460 went to Great Britain, \$147,098 to the United States, and \$20,662 to other countries. In 1897 the total export was \$741,959, of which \$164,138 went to Great Britain and \$576,720 to the United States. In nine months of the fiscal year ending March, 1907, the export of pulp was \$2,984,945, of which \$558,600 went to Great Britain, \$2,397,448 to the United States, and the balance to France, Mexico, Japan, the West Indies and Italy.

The exports of Canadian-made paper in the nine months of 1907 were valued at \$1,657,740, besides \$20,412 of wallpapers. Great Britain was the largest importer of paper, the amount sent to that country in the nine months being \$920,272, to Australia \$333,326, New Zealand \$139,687, and to the United States \$109,273. This is a large increase in recent years, the exports for the whole of the year of 1903 amounting to less than \$900,000, including wall papers.

This is a good record, both in regard to manufacturing and the export trade, but the possibilities of the pulp and paper business in its various ramifications, under a rational system of forest conservation are beyond the conception of the ordinary citizen, who has not followed the course of events in this special field. Nature has marked out Canada to be the leading pulp and paper manufacturing country in the world, if we make the right use of the resources a beneficent Providence has given us. To make mechanical pulp economically cheap water powers are needed, and these we have. The quality of our wood and the quality of the labor to handle it are both unsurpassed by any country in the world.

But what will happen if the unrestricted export of wood drains the country of the raw material upon which these industries are founded? We will be like the drunkard who, after spending his time and money in the saloon, finds himself kicked out in the street, unpitied by those who have despoiled him. This analogy goes deeper than may appear at first thought, because if we allow our land to be stripped of its forests we not merely deprive our posterity of the great benefits of these industries, but we commit the greater crime of crippling our water-powers, and turning our fruitful lands into deserts, as is made clear by those writers who deal with the forestry aspect of the question.

But the export of pulpwood is poor business from every standpoint. When the present accessible areas are stripped bare to supply American mills it will cost the country millions of dollars to build railways to tap more remote regions, and meanwhile all we have derived is the paltry price of pulpwood to the land-owner, plus the freight, which is in the lowest scale fixed by the transportation companies. The more such a raw material goes freely out of the country the more strongly entrenched does the industry become in a country which competes with our own both abroad and at home, and the longer delayed will be the period when our own products will have a permanent hold upon foreign markets.

In comparing the improvident policy of unrestricted exports of pulpwood with a national forestry policy combined with a national pulp and paper policy the writer recently gave the following illustration:—The value of a cord of spruce pulpwood shipped from the Eastern Townships to the United States, four years ago was about \$3.50 per cord; while a cord shipped in 1907 is worth \$6 to \$7 in the rough, or \$8 to \$10 when peeled. To the latter value—the highest valuation in the history of the Province and being in itself a confirmation of the preceding statement as to development in the United States—add the average railway freight (\$3 a cord), and the money left in the Province from the export of the cord of wood is, say, \$10. Now if the same cord of wood is made into ground pulp in Canada, the result would be \$20 per cord, and if it were manufactured into news print the value would be \$45 per cord, or if into paper of the higher qualities, the value would be \$50 to \$100 per cord. Applying these results to the pulpwood exported from Canada and taking the returns of the nine months of the official year as correct, the wood now exported to the United States would, if made into paper in Canada at an average of \$50 per ton, yield a product worth over \$30,000,000 a year. On the basis of the real totals of exports the product would be over \$40,000,000, and to this must be added the increased manufacturing in lines of industry that would develop where the raw material is some form of manufactured pulp or paper, such as already noted, perhaps doubling that total.

Beyond this advantage is the benefit to the farmers, merchants and railways from traffic created by the towns in which such industries would be seated. The railway freight tariff, for example, on pulpwood is one of the lowest in the scale of freight rates. On pulp it is double that on pulpwood, and on paper about ten times, while the value to the railway of the traffic arising from the miscellaneous transactions of a town is a hundred or a thousand times greater than the hauling of a crude material like logs.

There is no side from which this problem can be viewed that does not show it to be the part of wisdom to conserve and develop our own resources. In such a policy there is no antagonism to the United States; it is simply an act of self-preservation. The Americans themselves are endeavoring, at painful present sacrifices, to restore the forests they have lost, and they cannot blame us for doing now in our own interest that which they, had they realized the tremendous consequences of forest destruction, would have done years ago, without thought of the effect upon Canada.

Let us therefore be wise by others' follies rather than by our own.

The Naval Building Programmes



THE LONDON TIMES published recently an article, occupying nearly five columns, giving details of the warships lately launched and now under construction for the British, American, German, French, Italian, Russian, and Japanese navies. We make the following extracts:—

At the close of 1906 the naval situation was entirely satisfactory to this country. Not only had our progress been steady and continuous, resulting in an absolute strengthening of our naval position, but, owing to the hesitation of other Powers in view of the advent of the Dreadnought, our position relatively to theirs had improved also. During 1907, while we have been able to push ahead, adding new vessels to our fleets, the other Powers have only just begun the construction of vessels on the Dreadnought principle. The result is that Great Britain has obtained a considerable lead in vessels of the new type, and should, in the spring of 1910, have a fleet of ten Dreadnoughts and Invincibles in commission and effective, while at that date neither in Europe nor in America will a similar ship have been completed. It will not be, indeed, until about twelve months later that the great vessels which France, Germany, and the United States have been laying down, or are preparing to lay down, will pass into an effective state; and although, therefore, it is not necessary—and may be inexpedient, for reasons which were set forth in the Times twelve months ago by Sir William White—to rush into a big programme this year, there can be little question that we shall have to bestir ourselves in the programme for 1909-10 if the two-Power standard in its most rigid form is to be maintained. In this connection it may be recalled that, until Mr. Haldane at Blair Athol indicated that the standard contemplated the inclusion of the United States, the official interpretation applied only to the two next strongest European naval Powers.

During the past year three battleships, four armored cruisers, six destroyers, nine torpedo-boats, and three submarines have been put into the water. The aggregate displacement of these vessels put afloat exceeds 130,000 tons; and of this amount 55,800 tons is taken up by battleships, 66,350 tons by armored cruisers, and 5,750 tons by destroyers, the balance being distributed amongst the smaller vessels. The total armored displacement of vessels launched in 1907 exceeds that of the output of all the other great naval Powers together by upwards of 7,000 tons. In comparison, too, with the British output in recent years, this record is very satisfactory; for it exceeds the displacement of ships launched in 1906 by 45,000 tons, the aggregate of 1905 by 36,000 tons, and that of 1904 by 15,300 tons. Moreover, the vessels launched during 1907 are relatively of greater fighting capacity, they are more completely armored, have increased speed, and carry more heavy guns. A notable feature of the shipbuilding has been its acceleration, due in a large measure to improved dockyard organization and to more modern equipment and plant. The date of launch does not as a rule give any

indication of the rate of progress of the construction of a ship; but in this country, and recently, it has been determined by the progress of the preparation for laying down another vessel on the same slip; and everything points to the fulfilment of the promise that battleships shall be completed within two years, and the Invincible class in a slightly longer period.

The following ships were launched in 1907 and are now completing:—3 battleships, 4 armored cruisers, 6 destroyers, 9 torpedo-boats, and 3 submarines. There were completed during the year 4 armored cruisers and 12 first-class torpedo-boats; while 2 battleships and 2 armored cruisers, launched before 1907, must be added to the list of vessels now completing. The ships building or to be laid down before the end of the financial year are—3 battleships, 1 unarmored cruiser, 7 destroyers, 19 torpedo-boats, and 17 submarines.

The United States
In the current issue of the Naval Annual Mr. T. A. Brassey says:—"The most important change in the relative strength of navies in the year under review is the fact that the United States has now become the second naval power in the world." In his annual report which was issued last month, Mr. Metcalf, the secretary of the United States navy, while accepting as accurate the statement that the American navy at the present time is second in point of efficiency, argues that its position is largely due to the fact that during the past fiscal year its sea strength and fighting efficiency has been increased by the completion and delivery of a number of new battleships and cruisers of the largest and most approved types. He asserts, however, that the United States will not maintain this position very long unless Congress authorizes the building of additional ships.

In this connection it is noteworthy that Sir William White, in December of 1906, said in the Times:—

At present it is probable that the United States stands next to us in warship building capability, but at a great distance.

The battleships and armored cruisers completed and commissioned for the American navy during 1906-7 number 12. Seven battleships and 3 armored cruisers were "laid down, launched, or completing," in 1907.

Germany
Assuming that no more battleships or cruisers of the Dreadnought type were laid down in this country for two years, the result of the German programme, if their ships are completed in three years, would be that in the summer of 1912 the two Powers would be on an equality as far as Dreadnoughts and Invincibles are concerned—that is to say, each would have seven of the former and three of the latter; but Great Britain would still have a very considerable margin of superiority over Germany in regard to the older types of battleships and armored cruisers.

Of the older programmes, two battleships of the Deutschland type were completed for Germany in 1907. Two more vessels of the same type are completing afloat. Two armored cruisers were also completed, besides four second-class protected cruisers. No ar-

more ships were launched for Germany during 1907, and only one protected cruiser. Four battleships of the Dreadnought type, two armored cruisers, and four protected cruisers are building.

The German ships under construction or completing include eight battleships, four armored cruisers, and eight protected cruisers.

France
The French naval programme for 1908 is a continuation of the programme of 1906, and does not contemplate the addition of battleships or armored cruisers, beyond the six of the former and four of the latter already authorized. In 1908 two armored cruisers, twelve destroyers, and six submarines are to be completed; six battleships, two armored cruisers, ten destroyers, and 35 submarines are to be continued; and ten destroyers and five submarines are to be put in hand.

Italy
Good progress was made with warship construction for the Italian navy during 1907, two battleships being completed for sea, while another vessel of the same type was launched, three armored cruisers were begun, and one armored cruiser was put into the water. The vessels begun, completed, or authorized during 1907 include six battleships and five armored cruisers.

Russia
The reconstruction of the Russian fleet is proceeding slowly; and although only two armored cruisers were completed for service during the past year, there are six battleships and armored cruisers at present completing afloat, and there is now none on the stocks of the older programmes. One battleship and one armored cruiser were launched in 1907. The ships in hand include six battleships and four armored cruisers.

Japan
A large proportion of Japan's last Naval Budget was allocated to the restoration of the Russian prizes and the repairs of ships. No official announcement has been made of the number and types of ships of the new construction. It has been stated, however, that Japan is about to lay down three more battleships of 21,000 tons displacement, and that one of them may be built in this country. Several torpedo-boat destroyers and submarines of new design have recently been ordered at home and abroad. The vessels begun, completed, or authorized during 1907 include four battleships and four armored cruisers.

A novel device for smuggling has been discovered by two customs officers at Leith. A fender hanging over the side of a steamer was found to have had the cork taken out of it and tobacco substituted to the amount of over eleven pounds.

Mrs. Mary Nelson, who has died at Carrick-on-Shannon, at the age of 104, was one of Miss Nightingale's nursing staff in the Crimea, and witnessed the charge of the Light Brigade. She danced a jig at her last birthday.

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