Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

BULLETIN No. 758

Contribution from the Forest Service
HENRY S. GRAVES, Forester

Washington, D. C.

PROFESSIONAL PAPER

January 30, 1919

PULPWOOD CONSUMPTION AND WOOD-PULP PRODUCTION IN 1917.

By FRANKLIN H. SMITH, *Statistician in Forest Products.*

CONTENTS.

	Page.		Page.
Introduction.....	1	Pulpwood consumption—Continued.	
Pulpwood consumption and wood-pulp production, 1917.....	2	Condition of wood by species.....	5
Pulpwood consumption.....	2	Distance of pulpwood hauls.....	5
Annual wood consumption and cost.....	3	Wood-pulp production.....	6
Consumption of wood by species and States.....	3	Imports and exports of pulpwood, wood pulp, and paper.....	7
Consumption of wood by processes of manufacture.....	3	Imports of pulpwood.....	7
Average and total costs of wood.....	4	Imports of wood pulp.....	7
Range of pulpwood prices.....	4	Exports of wood pulp.....	7
Quantity and cost of wood by condition..	4	Imports of newsprint and other paper....	8
		Exports of newsprint and other paper....	8
		Appendix.....	9-19

INTRODUCTION.

This bulletin covering the year 1917 is the second of a series presenting detailed statistics on pulpwood consumption and wood-pulp production in the United States. The first was for 1916, and the figures for the two years are directly comparable. Similar statistics were compiled by the Forest Service for 1905 and for the period 1906-1911 in cooperation with the Bureau of the Census. The Bureau of the Census published figures for 1914 in connection with the census of manufactures.

The cooperation of the News-Print Manufacturers' Association in the collection and compilation of the statistics in 1916 was continued by the News-Print Service Bureau in 1917.

A return was made by every pulp mill solicited to make a report. The complete and cordial cooperation of the mills, particularly in view of the additional calls for information and the reduced clerical forces, is an evidence of the need of such statistics and of the convenience to the manufacturers of the form in which they are presented.

NOTE.—Acknowledgment is made for assistance in the collection and compilation of the statistics and in the review of the report to R. S. Kellogg, secretary of the News-Print Service Bureau, and Albert H. Pierson, of the Forest Service.

PULPWOOD CONSUMPTION AND WOOD-PULP PRODUCTION, 1917.

A total consumption in 1917 of 5,480,075 cords¹ of pulpwood was reported by 241 establishments, an increase of 251,517 cords, or 5 per cent, over the estimated total consumption in 1916. The imported spruce and aspen formed 14 per cent of the quantity used in 1917, in comparison with 15 per cent for the year before.

The production of wood pulp totaled 3,509,939 tons—an increase of 74,938 tons, or 2 per cent, over the 1916 reported total output. The quantity manufactured by the mechanical process was 1,535,953 tons, by the sulphite process 1,451,757 tons, by the soda process 437,430 tons, and by the sulphate process 84,799 tons. The quantity of mechanical pulp produced was 2 per cent, that of soda pulp 13 per cent, and that of sulphate pulp 15 per cent more than in 1916. The output of sulphite pulp was 1 per cent under that of the previous year.

The production of pulp was increased by the manufacturers under industrial conditions that were in reality conducive to decreased production. Not only did the cost of practically every material, inclusive of pulpwood, advance, but grave and discouraging problems were met with in securing and holding an adequate supply of labor, in procuring fuel for operation of plants, and in the transportation of both the raw and finished product. War enlarged rather than diminished the demand for pulp for ordinary purposes and at the same time developed additional uses for pulp and paper. Imports of wood pulp were practically as great as for the preceding year, despite the fact that total receipts from overseas were lighter because of war-time shipping conditions.

PULPWOOD CONSUMPTION.

In Table 1 are presented the figures on the consumption of pulpwood, by each kind of wood used, for four calendar years, 1909, 1914, 1916, and 1917. The use of both domestic and imported spruce shows a decline in 1917 from 1916, attributable perhaps to the more restricted supply available and to the possibilities attached to the cheaper species. Some of the less important species, such as balsam fir, yellow pine, tamarack, and the group of hardwoods—beech, birch, chestnut, and maple—were consumed in considerably greater quantity than during the previous year. Taken as a whole the figures for 1917 do not indicate any marked or significant changes, other than those referred to, from the statistics for 1916. While the consumption figures for the entire country are greater for 1917 than for 1916, decreases, which are mostly slight in character, are revealed (see Table 5) in individual State totals. In New York the

¹ Cord=128 cubic feet.

decrease was 3 per cent, New Hampshire 1 per cent, Pennsylvania 2 per cent, Minnesota less than 1 per cent, and West Virginia 6 per cent. On the other hand, increased consumption over the preceding year reached 9 per cent in Maine, 8 per cent in Wisconsin, less than 1 per cent in Michigan, 105 per cent in North Carolina, 7 per cent in Virginia, 25 per cent in Vermont, 102 per cent in Massachusetts, 1 per cent in California, Oregon, and Washington, and 20 per cent in all other States. (See Table 1, Appendix.)

ANNUAL WOOD CONSUMPTION AND COST.

Table 2 contains figures on the consumption of pulpwood for 1899 and for the years from 1905 to 1917 for which statistics are available. Total cost figures for 1910 and 1911 were not compiled. The consumption data reveal an almost unbroken annual increase, while the total cost figures emphasize the growing yearly expenditures made by the manufacturers. (See Table 2, Appendix.)

CONSUMPTION OF WOOD BY SPECIES AND STATES.

Pulpwood consumption by kinds of wood by the mills in the several States is detailed in Table 3. The importance and value of spruce for pulp is indicated by the fact that a greater quantity is used than of any other one wood, and that its use is reported in nearly all of the States. Spruce formed 56 per cent, hemlock 14 per cent, and poplar 7 per cent of all the pulpwood consumed. The use of certain woods, such as yellow pine, tamarack, white fir, Douglas fir, basswood, and white pine, is confined to the regions to which these species are indigenous.

As during the previous year, considerable spruce in log form that ordinarily would have gone to the sawmills was diverted to the pulp mills because of the higher prices paid by the latter.

Continued rise in wood prices will accelerate the tendency among the mills to utilize all the species available and will serve further to stimulate improvements in production to permit the use of woods of comparatively small pulp value. The 233,982 cords of slabs and other mill waste used in 1917 was 33,138 cords, or 16 per cent, in excess of the quantity reported in 1916. (See Table 3, Appendix.)

CONSUMPTION OF WOOD BY PROCESSES OF MANUFACTURE.

Table 4 shows the consumption of wood by kinds and by processes of manufacture. Of the 5,480,075 cords converted, 28 per cent went into the production of ground wood pulp, 53 per cent into sulphite, 15 per cent into soda, and 4 per cent into sulphate. The spruce, as shown by the tabulation, is about evenly reduced as between the mechanical and sulphite processes, while 89 per cent of the hemlock is reduced by the sulphite process, and 93 per cent of the poplar by the soda process. (See Table 4, Appendix.)

AVERAGE AND TOTAL COSTS OF WOOD.

Comparative figures for 1909, 1916, and 1917 are given in Table 5 on the number of establishments reporting, the quantity, average cost f. o. b. mill, and the total cost of the wood consumed, and the number of tons of wood pulp reported produced. The 1916 and 1917 figures are closely aligned, since the basis of collection and compilation was the same for each year; the 1909 statistics are reproduced to permit of the changes for the nine-year period being more readily noted.

A noteworthy advance of \$2.34—from \$8.76 to \$11.10, or 27 per cent—took place from 1916 to 1917 in the average cost per cord of wood f. o. b. mill. The average given is secured by a weighted or statistical computation and is based upon the average cost of approximately 90 per cent of all the wood reported consumed. No figures in this publication are likely to be more commented upon or questioned as to their correctness when compared directly with actual cost data of a single operation or a group of mills. The fact is therefore emphasized that the average cost figure was determined from pulp mill costs involving long and short hauls, rail or water hauls, or a combination of both, wood purchased in the open market, cut under old and new contracts, or taken from long held lands and for which but a nominal book charge was made. All species are represented and no distinction is made for the rough, peeled, and rossed wood. The per cent of increase in average value for the several States ranged from 13 per cent for the group of "all other States" to 56 per cent in North Carolina. The advance in Minnesota was 54 per cent, in New Hampshire 41 per cent, and in New York, Pennsylvania, West Virginia, and Vermont between 30 and 40 per cent. (See Table 5, Appendix.)

RANGE OF PULPWOOD PRICES.

Table 6 is presented to show more clearly the range of prices paid by the mills for wood according to its condition—rough, peeled, and rossed, and for slabs and other mill waste. Few mills out of the total number reporting costs got their supply of pulpwood for less than \$6 per cord; two mills paid between \$25 and \$26 per cord for their wood. The bulk of the mills paid somewhere between \$10 and \$20 per cord, and the average for the country as a whole was \$11.10. (See Table 6, Appendix.)

QUANTITY AND COST OF WOOD BY CONDITION.

Wood as delivered to the mill is referred to as rough, or with the bark intact, or as peeled and rossed, either of the two latter adding to the cost. In Table 7 are given, by States, the quantity, average cost, and total cost for the pulpwood according to the condition in which it was reported delivered to the mill. Of the wood consumed 46 per cent was in the rough, 41 per cent peeled, 9 per cent rossed, and 4

per cent in the form of slabs and other mill waste. In 1916, 34 per cent was in the rough, 51 per cent peeled, 11 per cent rossed, and 4 per cent slabs and mill waste.

Considerable variation exists in the average cost of the wood by reason of its treatment. For rough the average was \$9.67 per cord, for peeled \$11.91, for rossed \$17.03, and for slabs and other mill waste \$6.14. (See Table 7, Appendix.)

CONDITION OF WOOD BY SPECIES.

In Table 7 is shown the condition of pulpwood as delivered to the mill, arranged by States; in Table 8 the data are presented by kinds of wood. Of the domestic spruce 57 per cent is rough, 34 per cent peeled, and 9 per cent rossed; in imported spruce 18 per cent is rough, 49 per cent peeled, and 33 per cent rossed. In hemlock 79 per cent is rough, 20 per cent peeled, and 1 per cent rossed. Spruce, hemlock, and balsam fir are the only woods which are reported rossed. All of the imported poplar, yellow poplar, gum, Douglas fir, and basswood was peeled. (See Table 8, Appendix.)

DISTANCE OF PULPWOOD HAULS.

The belief prevails in the pulp and paper industry that the distance between the source of the pulpwood supply and the place of its manufacture grows greater with each succeeding year. Figures for a number of individual plants give weight to the assumption, but proof is lacking for the industry as a whole. In order that this important phase of operation might be recorded, the schedule employed by the Forest Service in making the 1917 census carried a question as to the approximate average distance between the source of supply of pulpwood covered by the report and the mill at which it was consumed. The data are shown in Table 9 arranged according to distance zones for the five principal pulp-producing States. The figures are truly representative, since the quantity of wood referred to by distance for each State amounts to 80 per cent or more of the total quantity reported consumed in that State, an exception being noted for New Hampshire alone, where the quantity of wood included in the distance tables is but 28 per cent of all the wood reported consumed. In Maine more than 60 per cent of the quantity reported upon was transported less than 150 miles; in New York 40 per cent was hauled between 300 and 500 miles; in Wisconsin 32 per cent was shipped between 150 and 200 miles and an additional 30 per cent under 150 miles; in New Hampshire 39 per cent was moved less than 25 miles and another 54 per cent between 25 and 50 miles; in Pennsylvania 32 per cent was carried between 600 and 1,000 miles and 27 per cent between 250 and 400 miles, the remainder between 100 and 250 miles. Taking the States as a whole, approximately 54 per cent was transported under 150 miles and another 35 per cent between

150 and 400 miles. Unfortunately, no comparative data are available for preceding periods. (See Table 9, Appendix.)

WOOD-PULP PRODUCTION.

The production figures on wood pulp are given in detail in Table 10. The total output reported was 3,509,939 tons ¹, of which 44 per cent was mechanical, 41 per cent sulphite, 13 per cent soda, and 2 per cent sulphate. The production of pulp in 1917 was 2 per cent more than in 1916, the mechanical pulp figures representing a 2 per cent increase, those for soda pulp a 13 per cent increase, and those for sulphate pulp a 15 per cent increase, while those for sulphite pulp are a 1 per cent decrease from the 1916 statistics. Of the mechanical pulp turned out 87 per cent was not steamed, and 13 per cent was steamed. In the production of sulphite pulp, 69 per cent was unbleached and 31 per cent bleached; in soda pulp 8 per cent was unbleached and 92 per cent bleached; in sulphate pulp, 83 per cent was unbleached and 17 per cent bleached. Maine, New York, Wisconsin, New Hampshire, Pennsylvania, and Minnesota are the leading States in pulp production in the order given and in 1917 produced collectively 79 per cent of all the pulp reported. (See Table 10, Appendix.)

The output of pulp was generally larger for all the States in 1917 than the year before, the exceptions being in New Hampshire where the decrease was 25 per cent, Pennsylvania 1 per cent, Michigan 3 per cent, and West Virginia 7 per cent. It already has been noted that less wood was used in New Hampshire, Pennsylvania, and West Virginia, which is in line with decreased pulp production even though the relation of quantity of wood consumed to pulp produced is variable.

Pulp manufacturers were asked to give the average value f. o. b. mill of all pulp sold, and the computations which have been made are based upon the reported value of approximately 90 per cent of all the pulp sold. The value of a ton of pulp is established by its quality and is further affected by competitive conditions, contractual relations, intercompany accounting methods, and other factors which make the application of an average value or sale price to any individual operation impracticable without due allowances being made. The mathematical average value for all pulp in 1917 was \$43.33, an increase of \$7.86 per ton, or 22 per cent, over the 1916 average. A considerable spread exists between the value of unbleached and bleached pulp, amounting to \$30.27 per ton for sulphite, \$6.55 for soda, and \$14.85 for sulphate. The spread is much less for steamed and not steamed mechanical pulp, reaching but \$2.73 per ton.

Figure 1 shows the importance of the several States in the production of pulp.

¹ Short ton—2,000 pounds.

IMPORTS AND EXPORTS OF PULPWOOD, WOOD PULP, AND PAPER.

Tables 11 to 15, inclusive, are transcripts of statistics compiled by the Department of Commerce and are of importance in connection with this report because of their showing of the annual imports of pulpwood, and the imports and exports of wood pulp and paper. Revised classifications effected during the periods covered by the tables account for the omissions and regroupings.

IMPORTS OF PULPWOOD.

In Table 11 is shown the annual imports of pulpwood for the last eight calendar years. The figures given in the table showing importations of 1,031,934 cords in 1917 are at variance with the figures in Table 1, giving the combined consumption of imported spruce and poplar as 867,301 cords. This difference is due to the fact that the Forest Service figures are for spruce and poplar consumption alone, while the statistics in Table 11 cover all pulpwoods imported.

FIG. 1.—Production of pulp in the United States, by States.

Further, all of the pulpwood imported during one calendar year may not be used during the same year but stored for future consumption. The number of cords imported in 1917 was less by 65,643 cords, or 6 per cent, than in 1916. The average value of \$8.30 per cord for the imported wood for 1917 is an increase of 27 per cent over the previous year. (See Table 11, Appendix.)

IMPORTS OF WOOD PULP.

The total importations of wood pulp in 1917 (Table 12) were 1 per cent less than those of 1916, but in excess of any other one of the years for which figures are given. There was a remarkable increase of 58 per cent—from \$44.02 to \$69.36—from 1916 in the average value per ton. The value is more than double that for 1915 or any other of the preceding years shown. In sharp contrast to this, the average value of domestically produced pulp advanced only 22 per cent. (See Table 12, Appendix.)

EXPORTS OF WOOD PULP.

Wood-pulp exports in 1917, as shown in Table 13, total 34,695 tons and were 3 per cent under those in 1916. Shipments were largely to Canada, England, Japan, and Argentina. There has been a decided acceleration in exports since the beginning of hostilities in Europe in 1914. A jump was made in the average value per ton of export pulp even greater than that in the value of imported pulp. The value rose from \$59.37 in 1916 to a flat \$100 in 1917, an advance of 68 per cent. (See Table 13, Appendix.)

IMPORTS OF NEWS PRINT AND OTHER PAPER.

A material increase in the imports of news print paper in 1917 over the imports of the previous year is shown in Table 14. The total quantity imported was 1,118,225,912 pounds, an increase of 19 per cent over 1916. The mathematical average value of the imported news print in 1916 was 1.98 cents per pound; in 1917 it was 2.76 cents per pound, an increase for the year of 39 per cent. While news print imports increased in 1917, the imports of all other printing paper fell off 67 per cent from the year before, and the imports of wrapping paper 6 per cent. (See Table 14, Appendix.)

EXPORTS OF NEWS PRINT AND OTHER PAPER.

Exports of news print paper in 1917 amounted to 187,780,747 pounds and were 22 per cent more than those recorded for 1916. The exports were equal to 27 per cent of the total imports of news print, showing that 83 per cent, or 930,445,165 pounds, of the total imports went into domestic consumption. Exports of all other printing paper declined 24 per cent in comparison with 1916, and exports for wrapping paper 37 per cent. Export figures are shown in Table 15, Appendix.

APPENDIX.

TABLE 1.—*Pulpwood consumption: Quantity of wood consumed by kinds, with per cent of distribution, 1909, 1914, 1916, and 1917.*

Kind of wood.	1917		1916		1914		1909	
	Quantity (cords).	Per cent distribution	Quantity (cords).	Per cent distribution	Quantity (cords).	Per cent distribution	Quantity (cords).	Per cent distribution
Total.....	5,480,075	100.0	5,228,558	100.0	4,470,763	100.0	4,001,607	100.0
Spruce:								
Domestic.....	2,385,966	43.5	2,399,993	45.9	1,892,739	42.3	1,653,249	41.3
Imported.....	681,450	12.4	701,667	13.4	768,056	17.2	768,332	19.2
Hemlock.....	775,003	14.1	760,226	14.6	602,754	13.5	559,657	14.0
Poplar:								
Domestic.....	313,955	5.7	329,370	6.3	328,513	7.3	302,876	7.6
Imported.....	92,298	1.7	82,326	1.6	61,644	1.4	25,622	.6
Balsam fir.....	382,086	7.0	301,032	5.8	125,296	2.8	95,366	2.4
Yellow pine.....	142,094	2.6	90,310	1.7	141,359	3.2	90,885	2.3
Jack pine.....	75,382	1.4	80,068	1.5	(1)		(1)	
Tamarack.....	58,732	1.1	33,271	.6	15,320	.3	(2)	
Yellow poplar.....	41,155	.7	37,974	.7	(3)		(3)	
White fir.....	33,181	.6	49,425	1.0	39,648	.9	37,176	.9
Cottonwood (poplar).....	32,993	.6	22,211	.4	18,176	.4	36,898	.9
Gum.....	32,513	.6	37,391	.7	11,935	.3	(2)	
Basswood.....	3,807	.1	11,481	.2	(2)		(2)	
White pine.....	3,562	.1	2,545	(5)	(2)		(2)	
Beech, birch, chestnut, and maple ⁶	183,317	3.3	477,762	1.5	(2)		(2)	
All other species.....	8,649	.2	10,662	.2	211,436	4.7	182,569	4.6
Slabs and other mill waste.....	233,982	4.3	200,844	3.9	253,887	5.7	248,977	6.2

¹ Included in "yellow pine."

² Included in "all other species."

³ Included in "domestic poplar" previous to 1916.

⁴ Not including "chestnut."

⁵ Less than one-tenth of 1 per cent.

⁶ Mills keep no separate record of species.

⁷ 1909 figures= Bureau of the Census and Forest Service.

⁸ 1914 figures= Bureau of the Census.

⁹ 1916 figures= Forest Service.

¹⁰ 1917 figures= Forest Service.

TABLE 2.—*Annual consumption of pulpwood and total cost for specified years.*

Year.	Consumption (cords).	Total cost.
1899.....	1,986,310	\$9,837,516
1905.....	3,192,123	17,735,665
1906.....	3,661,176	26,411,887
1907.....	3,962,660	32,360,276
1908.....	3,346,953	28,047,473
1909.....	4,001,607	34,477,540
1910.....	4,094,306	
1911.....	4,328,052	
1914.....	4,470,763	39,408,453
1916.....	5,228,558	¹ 45,785,682
1917.....	5,480,075	60,815,057

¹ Not including cost of slabs and other mill waste in Louisiana, Massachusetts, North Carolina, and Virginia.

TABLE 3.—*Pulpwood consumption: Quantity of wood consumed, by kinds and States, 1917.*

	Num- ber of es- ta-b- lish- ments.	Total.	Spruce.		Hem- lock.	Poplar.		Balsam fir.	Yellow pine.	Jack pine.	Tama- rack.	Yel- low pop- lar.	White fir.	Cot- ton- wood (pop- lar).	Gum.	Bass- wood.	White pine.	Beech, birch, chest- nut and maple.	Slabs and other mill waste.
			Do- mestic.	Im- ported.		Do- mestic.	Im- ported.												
United States.....	241	Cords, 5,480,075	Cords, 2,385,906	Cords, 681,450	Cords, 775,003	Cords, 313,955	Cords, 92,298	Cords, 382,036	Cords, 42,094	Cords, 75,382	Cords, 58,732	Cords, 41,155	Cords, 33,181	Cords, 32,903	Cords, 32,513	Cords, 3,807	Cords, 3,562	Cords, 183,317	Cords, 233,982
Maine.....	33	1,309,239	920,357	85,496	8,098	190,871	19,007	60,934	.....	45	.....	.....	.....	.....	.....	.....	.....	.....	24,431
New York.....	79	1,050,556	465,880	355,977	35,944	48,950	61,236	75,395	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,476
Wisconsin.....	38	805,490	197,970	33,628	443,666	3,707	.....	63,097	.....	7,708	48,041	.....	.....	65	.....	3,098	212	.....	6,730
New Hampshire.....	11	416,553	198,545	79,293	230	1,199	.....	137,129	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	157
Pennsylvania.....	14	415,776	20,000	93,424	10,985	8,914	12,029	6,000	7,574	64,098	.....	3,580	.....	.....	21,357	109	753	98,690	67,663
Minnesota.....	6	205,026	204,623	.....	.....	.....	.....	403	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michigan.....	11	187,117	58,485	10,046	50,373	1,583	.....	25,702	.....	2,931	10,061	.....	.....	.....	.....	.....	2,587	.....	25,309
Virginia.....	7	141,579	66,200	.....	18,400	.....	.....	.....	18,935	.....	.....	36,844	.....	.....	.....	.....	.....	.....	1,200
West Virginia.....	5	119,918	70,704	.....	23,774	1,832	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23,608
Vermont.....	10	109,616	86,247	8,360	1,341	1,201	26	12,441	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
California, Oregon, and Washington ¹	8	262,294	58,490	.....	148,444	.....	.....	.....	.....	.....	.....	.....	33,181	14,742	.....	.....	.....	.....	.....
All other States.....	19	450,911	38,459	15,226	33,748	55,638	.....	935	115,585	.....	.....	731	.....	18,186	11,156	.....	.....	84,627	75,408
																			7,437
																			1,212

¹ Includes Delaware, District of Columbia, Georgia, Louisiana, Maryland, Massachusetts, North Carolina, Ohio, South Carolina, Tennessee, Texas, and Vermont.

TABLE 4.—*Pulpwood consumption: Quantity of wood consumed, by kinds and processes of manufacture, 1917.*

	Aggregate quantity.	Reduced by—			
		Mechanical process.	Sulphite process.	Soda process.	Sulphate process.
Total.....	<i>Cords.</i> 5,480,075	<i>Cords.</i> 1,553,633	<i>Cords.</i> 2,892,322	<i>Cords.</i> 843,048	<i>Cords.</i> 191,072
Spruce:					
Domestic.....	2,385,966	1,076,027	1,290,817	4,890	14,232
Imported.....	681,450	264,570	415,870	1,010	.....
Hemlock.....	775,003	55,628	689,703	11,069	18,602
Poplar:					
Domestic.....	313,955	21,009	1,748	291,198	.....
Imported.....	92,298	508	3,522	88,268	.....
Balsam fir.....	382,036	98,225	262,478	921	20,409
Yellow pine.....	142,094	11,477	5,724	50,816	74,077
Jack pine.....	75,382	6,001	.....	64,698	4,683
Tamarack.....	58,732	12,393	4,784	.....	41,555
Yellow poplar.....	41,155	.....	.....	41,155	.....
White fir.....	33,181	2,646	30,535	.....	.....
Cottonwood (poplar).....	32,993	131	58	32,904	.....
Gum.....	32,513	.....	.....	32,513	.....
Douglas fir.....	7,421	.....	.....	7,421	.....
Basswood.....	3,807	.....	.....	3,807	.....
White pine.....	3,562	212	.....	753	2,597
Sycamore.....	1,212	.....	.....	1,212	.....
Cedar.....	16	.....	16	.....	.....
Beech, birch, chestnut, and maple.....	183,317	.....	.....	183,317	.....
Slabs and other mill waste.....	233,982	4,806	187,067	27,193	14,916

TABLE 5.—*Pulpwood consumption: Number of mills, quantity and cost of wood consumed, with average cost per cord and quantity of wood pulp produced by States, 1909, 1916, and 1917.*

State.	Wood consumed.				Wood pulp produced (tons).
	Year.	Establishment (number).	Quantity (cords).	Average cost per cord (f. o. b. mill).	Total cost.
United States.....	1917	241	5,480,075	\$11.10	\$60,815,057
	1916	230	5,228,558	8.76	145,785,682
	1909	253	4,001,607	8.62	34,477,540
Maine.....	1917	33	1,309,239	11.31	14,813,387
	1916	32	1,198,753	9.09	10,891,247
	1909	37	903,962	9.15	8,267,958
New York.....	1917	79	1,056,556	14.45	15,270,142
	1916	95	1,094,513	11.05	12,098,608
	1909	90	921,882	10.45	9,630,575
Wisconsin.....	1917	38	805,490	8.79	7,083,173
	1916	38	743,595	7.70	5,729,044
	1909	37	576,019	7.46	4,294,229
New Hampshire.....	1917	11	416,553	13.78	5,738,883
	1916	11	471,041	9.81	4,623,146
	1909	11	349,997	9.36	3,276,620
Pennsylvania.....	1917	14	415,776	11.23	4,669,165
	1916	13	423,843	8.74	3,706,081
	1909	15	295,038	7.25	2,139,087
Minnesota.....	1917	6	205,026	11.31	2,319,833
	1916	5	205,433	7.34	1,507,233
	1909	7	47,373	7.02	332,548
Michigan.....	1917	11	187,117	9.30	1,740,580
	1916	10	186,993	7.50	1,402,245
	1909	8	132,846	6.29	835,861

¹ Not including cost of "Slabs and other mill waste" in Louisiana, Massachusetts, North Carolina, and Virginia.

TABLE 5.—*Pulpwood consumption: Number of mills, quantity and cost of wood consumed, with average cost per cord and quantity of wood pulp produced by States, 1909, 1916, and 1917—Continued.*

State.	Wood consumed.				Wood pulp produced (tons).
	Year.	Establishment (number).	Quantity (cords).	Average cost per cord (f. o. b. mill).	Total cost.
North Carolina.....	1917	3	175,433	\$8.05	1,412,940
	1916	3	85,709	5.16	1,266,207
	1909	4	145,090	6.34	919,733
Virginia.....	1917	7	141,579	10.31	1,459,061
	1916	6	132,736	8.46	1,036,116
	1909	6	92,039	8.40	772,963
West Virginia.....	1917	5	119,918	8.61	1,032,045
	1916	5	127,478	6.42	818,983
	1909	5	109,166	5.43	582,985
Vermont.....	1917	10	109,616	12.33	1,351,825
	1916	10	87,675	9.43	826,904
	1909	11	70,977	10.18	722,777
Massachusetts.....	1917	4	55,897	12.58	703,369
	1916	3	27,640	9.91	1,271,978
	1909	5	45,899	8.80	403,778
California, Oregon, and Washington....	1917	8	262,294	6.43	1,687,670
	1916	8	259,544	5.67	1,472,736
	1909	8	155,843	7.52	1,172,556
All other States.....	² 1917	12	219,581	6.98	1,532,984
	³ 1916	11	183,605	6.18	⁴ 1,135,154
	⁵ 1909	9	155,476	6.86	1,125,870

¹ Not including cost of "Slabs and other mill waste."² Includes Delaware, District of Columbia, Georgia, Louisiana, Maryland, Mississippi, Ohio, South Carolina, Tennessee, and Texas.³ Includes Delaware, Georgia, Louisiana, Maryland, Mississippi, Ohio, South Carolina, and Texas.⁴ Not including cost of "Slabs and other mill waste" in Louisiana.⁵ Includes Delaware, Maryland, Ohio, South Carolina, and Texas.TABLE 6.—*Prices paid for pulpwood, number of mills, and form in which purchased.*

Range of price per cord (f. o. b. mill).	Number of mills.			Slabs and other mill waste.
	Rough.	Peeled.	Rossed.	
\$1.00-\$1.99.....				1
2.00- 2.99.....	2			
3.00- 3.99.....	1			4
4.00- 4.99.....	1	1		3
5.00- 5.99.....	4	4		6
6.00- 6.99.....	13	3		6
7.00- 7.99.....	10	5		3
8.00- 8.99.....	14	10	1	3
9.00- 9.99.....	21	5		
10.00-10.99.....	10	12		
11.00-11.99.....	26	15		
12.00-12.99.....	13	15	2	
13.00-13.99.....	9	17	2	3
14.00-14.99.....	5	13	1	
15.00-15.99.....	5	10	5	
16.00-16.99.....	2	13	4	
17.00-17.99.....		5	7	
18.00-18.99.....	.1	8	4	
19.00-19.99.....		7	7	
20.00-20.99.....		1	3	
21.00-21.99.....		1	3	
22.00-22.99.....			2	
23.00-23.99.....			1	
24.00-24.99.....				
25.00-26.00.....		1	1	

TABLE 7.—*Pulpwood consumption: Quantity, average cost per cord, and total cost of wood consumed according to condition, by States, 1917.*

State.	Total.			Rough.			Peeled.			Rossed.			Slabs and other mill waste.		
	Quantity (cords).	Average cost per cord (f. o. b. mill).	Total cost.	Quantity (cords).	Average cost per cord (f. o. b. mill).	Total.	Quantity (cords).	Average cost per cord (f. o. b. mill).	Total cost.	Quantity (cords).	Average cost per cord (f. o. b. mill).	Total cost.	Quantity (cords.)	Average cost per cord (f. o. b. mill).	Total cost.
United States ..	5,480,075	\$11.10	\$60,815,057	2,500,827	\$9.67	\$24,180,745	2,258,169	\$11.91	\$26,905,102	487,097	\$17.03	\$8,293,074	233,982	\$6.14	\$1,436,136
Maine.....	1,309,239	11.31	14,813,387	602,533	10.79	6,502,120	522,659	11.38	7,085,847	59,616	18.46	1,100,721	24,431	5.10	124,699
New York.....	1,056,556	14.45	15,270,142	195,764	11.50	2,251,658	651,220	14.45	9,411,261	200,096	17.56	3,513,132	9,476	9.93	94,091
Wisconsin.....	805,490	8.79	7,083,173	721,606	8.78	6,333,378	77,057	9.27	714,043	97	16.49	1,600	6,730	5.07	34,152
New Hampshire.....	416,553	13.78	5,738,883	82,488	10.30	849,582	143,609	13.34	1,915,047	190,299	15.62	2,972,174	157	13.25	2,080
Pennsylvania.....	415,776	11.23	4,669,165	46,400	16.00	742,400	274,532	10.63	2,918,451	27,181	19.60	532,841	67,663	7.08	475,473
Minnesota.....	205,026	11.31	2,319,833	205,026	11.31	2,319,833	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michigan.....	187,117	9.30	1,740,580	149,002	9.79	1,457,996	12,806	9.77	125,161	.....	.....	.....	25,309	6.22	157,423
Virginia.....	141,579	10.31	1,459,061	18,935	6.00	113,610	121,444	11.04	1,341,251	.....	.....	.....	1,200	3.50	4,200
West Virginia.....	119,918	8.61	1,032,045	53,874	6.94	373,963	42,436	11.93	506,326	.....	.....	.....	23,608	6.43	151,756
Vermont.....	109,616	12.33	1,351,825	54,272	10.28	557,845	51,877	14.17	735,241	3,467	16.94	58,739	.....	.....	.....
California, Oregon, and Washington.....	262,294	6.34	1,687,670	191,772	6.84	1,311,667	70,522	5.33	376,003	.....	.....	.....	.....	.....	.....
All other states ¹	450,911	8.09	3,648,293	179,155	7.63	1,366,893	190,007	9.35	1,776,471	6,341	17.96	113,867	75,408	5.20	392,262

¹ Includes Delaware, District of Columbia, Georgia, Louisiana, Maryland, Massachusetts, North Carolina, Tennessee, Texas, and Vermont.

TABLE 9.—*Reported length of pulpwood haul, by States.*

Distance zones.	Total quantity.	Maine.		New York.		Wisconsin.		New Hampshire.		Pennsylvania.		All other States.	
		Quantity.	Per cent distribution.	Quantity.	Per cent distribution.	Quantity.	Per cent distribution.	Quantity.	Per cent distribution.	Quantity.	Per cent distribution.	Quantity.	Per cent distribution.
Total.....	<i>Cords.</i> 4,378,789	<i>Cords.</i> 1,082,713	100.0	<i>Cords.</i> 931,566	100.0	<i>Cords.</i> 707,194	100.0	<i>Cords.</i> 115,823	100.0	<i>Cords.</i> 366,604	100.0	<i>Cords.</i> 1,174,889	100.0
1-24 miles.....	253,755	62,982	5.8	55,172	5.9	6,452	0.9	45,097	38.9	—	—	84,052	7.2
25-49 miles.....	381,994	119,662	11.1	49,355	5.3	27,897	3.9	62,726	54.2	—	—	121,954	10.4
50-74 miles.....	293,552	62,395	5.8	61,467	6.6	75,293	10.6	8,000	6.9	—	—	86,397	7.4
75-99 miles.....	492,968	300,427	27.7	88,436	9.5	7,017	1.0	—	—	—	—	35,476	3.0
100-149 miles.....	952,363	131,153	12.1	96,660	10.4	94,899	13.4	—	—	61,612	16.8	594,703	50.6
150-199 miles.....	392,063	3,837	.4	15,167	1.6	296,627	32.1	—	—	34,948	9.5	122,195	10.4
200-249 miles.....	293,941	114,020	10.5	52,278	5.6	83,579	11.8	—	—	24,237	6.6	13,579	1.1
250-299 miles.....	428,928	254,868	23.5	63,635	6.8	34,304	4.9	—	—	30,485	8.3	13,900	1.2
300-399 miles.....	415,876	33,369	3.1	212,199	22.8	108,292	15.3	—	—	62,221	17.0	25,725	2.2
400-499 miles.....	204,078	—	—	166,217	17.9	1,899	0.3	—	—	36,291	9.9	36,862	3.1
500-599 miles.....	89,073	—	—	18,138	1.9	40,935	5.8	—	—	—	—	30,000	2.6
600-699 miles.....	30,662	—	—	20,616	2.2	—	—	—	—	—	—	10,046	.8
700-799 miles.....	72,552	—	—	16,742	1.8	—	—	—	—	55,810	15.2	—	—
800-899 miles.....	15,484	—	—	15,484	1.7	—	—	—	—	—	—	—	—
900-999 miles.....	61,000	—	—	—	—	—	—	—	—	61,000	16.7	—	—
Total reported consumption.....	5,480,075	1,309,239	—	1,056,556	—	805,490	—	416,553	—	415,776	—	1,476,461	—

TABLE 10.—*Production of unbleached and not steamed and bleached and steamed wood pulp, with average value per ton and total value, by States and processes, 1917.*

State.	Total.			Mechanical.			Sulphite.			Soda.			Sulphate.		
	Quan- tity (tons).	Aver- age value per ton f. o. b. mill.	Total value.	Quan- tity (tons).	Aver- age value per ton f. o. b. mill.	Total value.	Quan- tity (tons).	Aver- age value per ton f. o. b. mill.	Total value.	Quan- tity (tons).	Aver- age value per ton f. o. b. mill.	Total value.	Quan- tity (tons).	Aver- age value per ton f. o. b. mill.	Total value.
United States.....	3,509,939	\$43.33	\$150,902,280	1,535,953	\$21.98	\$33,762,755	1,451,757	\$58.12	\$84,380,253	437,430	\$65.14	\$28,494,433	84,709	\$50.29	\$4,264,888
				Not steamed.			Unbleached.								
2,440,684	34.04	83,069,111	1,336,268	\$21.63	\$28,898,169	999,999	\$48.70	\$48,937,382	34,509	\$61.85	\$2,134,553	69,998	\$47.70	\$3,339,007	
Maine.....	659,497	26.87	17,721,964	422,195	16.07	6,783,842	228,905	44.50	10,185,712	(1)	100.00	(1)	(1)	65.00	(1)
Michigan.....	77,789	55.67	4,330,282	13,052	21.09	275,217	57,413	63.94	3,070,994	(1)	(1)	(1)	(1)	52.44	(1)
Minnesota.....	131,893	29.77	3,924,665	83,401	20.69	1,725,363	(1)	45.40	(1)	(1)	(1)	(1)	(1)	(1)	(1)
New Hampshire.....	128,635	35.00	4,501,654	59,933	27.72	1,421,678	68,702	44.83	3,070,976	(1)	(1)	(1)	(1)	(1)	(1)
New York.....	641,828	36.62	23,501,382	410,664	24.73	10,136,716	231,161	57.73	13,344,666	(1)	(1)	(1)	(1)	(1)	(1)
Pennsylvania.....	64,161	50.25	3,224,109	(1)	20.59	(1)	36,815	50.62	1,863,476	(1)	54.30	(1)	(1)	63.00	(1)
Vermont.....	87,815	29.67	2,553,173	70,027	22.78	1,595,216	(1)	48.89	(1)	(1)	(1)	(1)	(1)	49.91	1,570,395
Wisconsin.....	363,340	40.72	14,794,528	150,743	26.96	4,515,615	181,133	48.08	8,708,518	(1)	(1)	(1)	(1)	(1)	(1)
California, Oregon, and Wash- ington.....	203,333	25.90	5,266,316	103,828	17.90	1,858,221	99,505	34.25	3,408,095	(1)	(1)	(1)	(1)	(1)	(1)
All other States ²	82,443	39.43	3,251,938	22,425	25.25	566,271	96,272	46.08	4,435,945	34,509	61.85	2,134,553	38,534	45.90	1,768,612
				Steamed.			Bleached.								
1,069,255	63.44	67,833,169	199,685	\$24.36	\$4,894,587	451,848	\$78.97	\$35,682,871	402,921	\$68.40	\$26,359,880	14,801	\$62.55	\$925,831	
Maine.....	239,301	53.68	12,846,152	48,482	20.81	1,009,110	75,742	70.70	5,354,839	115,077	56.33	6,482,203	(3)	52.44	(3)
Michigan.....	18,834	56.55	1,065,156	(3)	30.00	(9)	10,970	75.06	823,379	(1)	(1)	(1)	(1)	(1)	(1)
New Hampshire.....	138,010	80.76	11,145,965	65,870	27.60	1,817,763	128,010	80.76	11,145,965	(1)	(1)	(1)	(1)	(1)	(1)
New York.....	156,788	58.52	9,175,465	65,870	27.60	1,817,763	(3)	92.48	62,826	75.76	4,759,754	(3)	62.55	(3)	(3)
Pennsylvania.....	150,809	68.37	10,316,000	53,547	24.00	1,285,061	(3)	69.48	99,571	67.60	6,731,131	(3)	55.00	(3)	(3)
Wisconsin.....	92,789	48.31	4,482,287	31,786	23.68	752,653	36,642	83.35	3,054,226	125,447	66.86	8,386,792	14,801	62.55	925,831
All other States ⁴	272,634	68.96	18,801,544	31,786	23.68	752,653	190,484	80.55	15,304,762	(1)	(1)	(1)	(1)	(1)	(1)

¹ Included in "All other States," unbleached and not steamed.² Includes District of Columbia, Georgia, Massachusetts, Mississippi, North Carolina, Ohio, South Carolina, Texas, Virginia, and West Virginia.³ Included in "All other States," bleached and steamed.⁴ Includes Delaware, District of Columbia, Louisiana, Maryland, Massachusetts, Minnesota, North Carolina, Ohio, Tennessee, Vermont, Virginia, Washington, and West Virginia.

NOTE.—Short ton=2,000 pounds.

TABLE 11.—Imports of pulpwood, calendar years, 1910 to 1917.

Year.	Quantity.				Value (see note).		
	By form.	Cords.	Per cent of form.	Total cords.	Per cord.	Average.	Total.
Total (8 years).....				7,894,572		\$6.82	\$53,845,160
1917.....			100.0	1,031,934		8.30	8,563,458
	Rough.....	206,081	20.0		\$7.29		
	Peeled.....	673,235	65.2		8.07		
	Rossed.....	152,618	14.8		10.73		
1916.....			100.0	1,097,577		6.56	7,202,570
	Rough.....	190,921	17.4		5.93		
	Peeled.....	742,337	67.6		6.43		
	Rossed.....	164,319	15.0		7.90		
1915.....			100.0	975,974		6.43	6,278,948
	Rough.....	258,620	26.5		5.82		
	Peeled.....	544,139	55.8		6.28		
	Rossed.....	173,215	17.7		7.83		
1914.....			100.0	999,649		6.78	6,773,198
	Rough.....	198,414	19.8		6.04		
	Peeled.....	599,299	60.0		6.40		
	Rossed.....	201,936	20.2		8.61		
1913.....			100.0	1,034,885		6.77	7,007,350
	Rough.....	195,906	18.9		5.66		
	Peeled.....	581,756	56.2		6.47		
	Rossed.....	257,223	24.9		8.30		
1912.....			100.0	933,565		6.67	6,227,346
	Rough.....	139,002	14.9		6.03		
	Peeled.....	528,900	56.7		6.06		
	Rossed.....	265,663	28.4		8.23		
1911.....			100.0	889,257		6.39	5,682,716
	Rough.....	191,062	21.5		5.44		
	Peeled.....	473,116	53.2		5.98		
	Rossed.....	225,079	25.3		8.06		
1910.....			100.0	931,731		6.56	6,109,574
	Rough.....	229,691	24.7		5.83		
	Peeled.....	459,681	49.3		6.28		
	Rossed.....	242,359	26.0		7.77		

NOTE.—The value of merchandise imported is the actual market value or wholesale price thereof at the time of exportation to the United States in the principal markets of the country from whence exported.

TABLE 12.—Imports of wood pulp, calendar years 1907 to 1917.

	Total.		Mechanically ground.		Chemical—unbleached.				Chemical—bleached.			
					Unclassified.		Sulphite.		Unclassified.		Sulphite.	
	Quantity (long tons).	Average value per ton.	Quantity (long tons).	Value.	Quantity (long tons).	Value.	Quantity (long tons).	Value.	Quantity (long tons).	Value.	Quantity (long tons).	Value.
Total (11 years)...	5,063,631	\$37.55	1,774,702	\$35,450,637	1,786,427	\$65,578,721	375,469	\$30,113,666	150,749	\$13,143,500	53,649	\$5,760,344
1917.....	665,215	69.36	249,172	7,991,368	120,575	15,255,237	221,583	19,291,410	26,146	21,506,034	36,640	4,508,368
1916.....	610,504	44.02	234,390	4,696,801	257,232	10,954,182	153,886	10,822,256	114,842	3,363,998	17,009	21,251,976
1915.....	507,481	33.36	155,407	2,588,846	287,232	10,954,182	153,886	10,822,256	114,842	3,363,998	17,009	21,251,976
1914.....	603,183	33.84	193,979	3,246,933	294,884	11,180,232	153,886	10,822,256	114,842	3,363,998	17,009	21,251,976
1913.....	483,442	32.96	153,517	2,670,781	264,513	9,676,380	153,886	10,822,256	114,842	3,363,998	17,009	21,251,976
1912.....	482,277	30.90	14,903,218	165,896	247,501	8,477,766	153,886	10,822,256	114,842	3,363,998	17,009	21,251,976
1911.....	502,165	28.66	14,394,253	234,537	190,394	6,482,360	153,886	10,822,256	114,842	3,363,998	17,009	21,251,976
1910.....	452,478	29.38	13,296,500	200,164	183,701	6,374,762	153,886	10,822,256	114,842	3,363,998	17,009	21,251,976
1909.....	328,259	31.42	10,315,089	127,669	144,350	5,189,794	153,886	10,822,256	114,842	3,363,998	17,009	21,251,976
1908.....	223,647	31.19	6,376,311	2,266,668	53,277	1,987,948	153,886	10,822,256	114,842	3,363,998	17,009	21,251,976
1907.....	264,980	30.29	8,024,952	1,137,595	53,277	1,987,948	153,886	10,822,256	114,842	3,363,998	17,009	21,251,976

1 Jan. 1 to June 30 only.

2 July 1 to Dec. 31.—In 1908 an additional quantity of wood pulp, not classified as to kind, was imported up to June 30, amounting to 89,763 tons, valued at \$2,905,842.

TABLE 13.—*Exports of wood pulp, calendar years 1908 to 1917.*

Year.	Quantity (long tons).	Value.	
		Average per ton.	Total.
Total (10 years).....	163,914	\$59.73	\$9,791,089
1917.....	34,695	100.00	3,469,549
1916.....	35,735	59.37	2,121,745
1915.....	18,120	45.26	820,134
1914.....	11,015	43.98	484,477
1913.....	17,657	41.82	738,451
1912.....	¹ 12,669	42.86	542,949
1911.....	¹ 8,477	45.62	386,711
1910.....	¹ 7,465	46.12	344,251
1909.....	¹ 7,994	46.13	368,738
1908.....	¹ 10,087	50.97	514,084

¹ Quantity shown in pounds and is reduced in this table to the nearest long ton.TABLE 14.—*Imports of paper, calendar years 1910 to 1917.*

Year.	Total.	News-print paper.		All other printing paper.		Wrapping paper.		All other paper.
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
Total (8 years).....	\$201,779,996	<i>Pounds.</i> 4,258,310,682	\$91,876,005	<i>Pounds.</i> 31,532,503	\$1,944,558	<i>Pounds.</i> 77,054,050	\$4,503,848	\$103,455,585
1917.....	41,734,084	1,118,225,912	30,929,628	412,091	67,931	6,661,518	456,752	10,279,773
1916.....	28,189,998	936,460,899	18,527,748	1,259,761	119,802	7,103,661	280,952	9,261,496
1915.....	24,465,694	736,817,721	14,138,651	2,395,755	161,703	22,208,212	626,661	9,538,679
1914.....	27,604,771	630,950,295	12,189,792	5,752,447	261,616	41,080,659	1,156,591	13,996,772
1913.....	24,359,827	439,687,195	8,549,062	6,758,490	371,328	.....	735,857	14,703,580
1912.....	18,723,877	171,186,402	3,262,778	5,597,094	292,242	.....	846,500	14,322,357
1911.....	18,112,859	111,660,615	2,096,105	7,376,598	534,250	.....	400,535	15,081,969
1910.....	18,588,886	113,321,643	2,182,241	¹ 1,980,267	¹ 135,686	.....	.....	16,270,959

¹ July 1 to Dec. 31.TABLE 15.—*Exports of paper, calendar years 1910 to 1917.*

Year.	Total.	News-print paper.		All other printing paper.		Wrapping paper.		All other paper.
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
Total (8 years).....	\$207,525,606	<i>Pounds.</i> 918,231,527	\$25,767,653	<i>Pounds.</i> 430,324,115	\$26,222,250	<i>Pounds.</i> 208,756,641	\$11,048,494	\$144,487,209
1917.....	46,566,671	187,780,747	7,597,509	94,423,954	8,168,277	52,519,392	3,988,727	26,812,158
1916.....	39,576,879	153,472,663	4,126,617	124,145,837	8,069,812	83,673,411	4,025,388	23,355,062
1915.....	22,264,371	110,322,513	2,707,626	44,657,646	2,169,067	36,991,079	1,667,387	15,720,291
1914.....	20,113,942	121,578,332	2,983,344	30,259,588	1,568,960	14,815,496	522,951	15,038,687
1913.....	21,174,217	86,602,057	2,105,984	28,117,371	1,617,285	13,722,414	560,535	16,890,413
1912.....	21,166,566	111,135,997	2,690,225	26,904,552	1,440,992	¹ 7,034,849	¹ 283,506	16,751,843
1911.....	18,702,151	97,841,361	2,357,455	26,429,186	1,278,796	.....	.....	15,065,900
1910.....	17,960,809	149,497,857	¹ 1,198,893	55,385,981	1,909,061	.....	.....	14,852,855

¹ Figures for period July 1 to Dec. 31.