The Pulp and Paper Industry in War and Peace

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ABSOLUTE essentiality of its products determines the economic course and development of an industry during war time. If all pulp, paper, and converted paper items were suddenly to become nonexistent the war would either end abruptly within a few months or revert to more primitive methods. Production of shells would be seriously curtailed because a large proportion of the propellent explosives are made from wood pulp;[1] there would not be suitable means of transmitting complicated data or instructions; there would not be any maps; new airplanes, tanks, ships, guns could not be built without blueprints; many products, especially food, could not be adequately packaged, and so on throughout a long list of vital wartime needs. On the other hand, some of the end products of the industry, or at least unrestricted uses of these end products, trespass into the field of nonessentials during war.

Thus, the pulp, paper, and converted products industry, consisting of over 3,000 establishments, employing over a quarter of a million wage earners, and annually producing products valued at over 2 billion dollars, presents major problems as regards maintenance of essential production on one hand and curtailment of unessential products on the other. The industry is a very important user of all types of transportation (rail, truck, and water). Directly and indirectly it requires a large number of wage earners for woods operations, trucking, mill operations, and distribution. It consumes large amounts of electric power, of which 75 percent is self-generated. Even though its principal raw material—growing timber—is adequate, its requirements for critical metals or chemicals are not relatively large, and its plant facilities and machinery are not convertible to other products, the industry is nevertheless vulnerable to curtailment and concentration primarily to release any unnecessary use of manpower, transportation, power, or critical raw materials which can be applied more directly to the war program.

What Is Pulp and Paper?

The question "What is pulp and paper?" may seem elementary, yet few people have a basic understanding of the products of the industry, let alone their economic significance.

The forest is the primary source of fibrous raw material used in the manufacture of most types of paper. Timber must be felled, cut into suitable-length logs, and transported by water, truck, or rail to the pulp mills. In 1941 the amount of pulpwood consumed was equivalent to a pile of cordwood 4 feet high, 4 feet wide, and 22,727 miles long. At the pulp mills the logs are converted into a fibrous mass either by a mechanical method of grinding the wood against stones or by one of several chemical treatments of the wood chips. In the chemical process large cooking tanks known as digestors are used. These are often about 50 feet high and 18 feet in diameter. Further refining at the pulp plant usually consists of washing, screening, and bleaching the pulp.

Although, in terms of total pulp output, wood is by far the principal raw material, other fibrous materials such as rags, straw, jute, and hemp are used for certain types of paper products requiring special properties. For paperboard, about 60 percent of the fibrous material used is old newspaper and old paperboard.

Paper and paperboard are produced on complicated and expensive Fourdrinier or cylinder machines, without question the largest stationary machines used by any industry. Modern paper machines cost from $500,000 to $1,000,000 each. In size they are about 10 to 30 feet wide, up to 30 feet high, and up to about 350 feet long.

In the paper mill the raw pulp is mechanically treated so as to reduce the pulp to individual fibers suspended in water. To this are added fillers, sizing, color, and other materials, the resulting mixture being known as furnish.

In producing paper on the Fourdrinier paper machine the furnish (usually from 99 to 99½ percent water) is deposited in a steady, regulated flow on the Fourdrinier wire. This consists of a finely woven copper screen in the form of a rapidly moving endless belt, often over 200 inches wide and as much as 50 or 60 feet long. Here much of the free water is drained off, leaving a sheet of interlaced fibers. As the "sheet" reaches the end of the wire it is picked up by an endless felt belt which carries it between large rolls where the fibers are set and more water is removed. It then goes to the driers which are heated cylinders—sometimes as many as 60. Thus, the sheet passes continuously through a maze of presses and driers so that by the time it comes off the "dry-end" of the machine it is paper.

Some paper and most paperboard is made on the cylinder or other basic type of paper machine. The principles involved are the same—the major difference

[1] In Europe practically all gunpowder is produced from wood pulp.

being that the copper screen wire is placed around hollow cylinders which dip into and pick up the pulp furnish, thereby creating a web of fibers which are removed by conveyor felts. There may be a number of cylinders operating in a row, each removing from the furnish a layer of fibers which is deposited on the moving felt. Thus, in the case of paperboard, it may be "built-up" of different pulp mixtures so that the outside layers are of a finer texture than the layers which comprise the core of the sheet. Pressing and drying are similar to the Fourdrinier process.

Certain types of paper such as newsprint, uncoated book paper, and common wrapping paper are used in the form they leave the paper machine. However, much paper and paperboard is processed or converted before being finally used. Among the converted paper products are supercalendered papers, paper bags, envelopes, boxes and cartons, drinking cups, toilet paper, napkins, facial tissue, and literally hundreds or thousands of other specific items.

Whereas the manufacture of pulp is confined to about 200 mills, and the production of primary paper and paperboard to about 640 plants, converted paper products are made in nearly 2,500 establishments.

Economic Characteristics of the Industry.

The paper and allied products industry, as measured both by value added and by value of products manufactured during 1939, stood eleventh in the array by size of the country's industry groups, with a total output valued at 2,020 billion dollars. Estimated total investment in plant and equipment exceeds 1,500 billions, which gives an average of $1.34 of annual output for each dollar of invested capital. Capital investment is highest in relation to output in plants making newsprint, which is a relatively low priced product requiring a large investment in water-power plant and forest reserves. Less capital is needed in relation to output in the fabrication of paperboard. While this is also a comparatively cheap commodity to produce, it can be made in great volume with relatively more simple and inexpensive equipment.

A heavy fixed investment is required to open a plant or to expand an existing firm and the percentage of net profit to net worth for paper manufacturers is typically low. Although the initial investment in the paper industry is large, the plant and equipment can be utilized several years without requiring any other significant capital expenditure. The final product is not subject to radical style changes that necessitate such expenditures. However, lack of frequent changes in plant equipment accounts for many marginal producers in the industry. Thus, changes in total costs of production are largely a function of variation in such direct costs as labor, raw material, and transportation. Since direct costs are a predominant consideration, it is natural that most plants should locate in small towns where these costs tend to be lower.

Once a plant has operated long enough and produced enough units (tons of paper) to amortize its original fixed investment, it is possible to close down and reopen on very short notice when market conditions warrant. This is not possible in industries such as steel, automotive, and electrical appliances that require constantly huge fixed investments and must meet periodic heavy interest payments.

Trend Toward Larger Managerial Units.

Along with the industrial expansion during the past 40 years, there have also developed certain changes in products, methods of distribution, and types of business organizations. One tendency has been the increase in size of the managerial unit. In 1872 individual entrepreneurs and the partnership form of ownership together accounted for over 80 percent of the owners of pulp and paper mills.[2] However, in 1934, 96 percent of managerial control was accounted for by the corporate form of business organization.

This growing trend toward more complete integration has been the result of consolidations and mergers as well as the development of extensive holding companies. In 1933, according to the Federal Trade Commission, one company controlled the manufacture and sale of 80 percent of the newsprint sold on the Pacific coast. The formation of these large units has been the natural outgrowth of a desire to obtain economies of large-scale organization. Huge, new forest reserves opened in the South and West since 1920 have required large expenditures in order for proper development to take place. As the size of paper mills grew, the necessary investment in them increased tremendously.

The process of vertical integration has moved forward into the marketing process as well as backward into the control of timberlands. In recent years the number of manufacturers' own sales branches in the paper industry has increased appreciably, and according to the 1939 Census of Wholesale Distribution, approximately 21 percent of paper manufacturers' sales were made through these branches, compared with only 7 percent in 1935. About 40 percent of total manufacturers' sales are direct purchases by industrial users, which use the paper in the course of their business or convert it into products for resale, while 35 percent are sales to independent paper merchants and limited-function wholesalers. Wallpaper is the only commodity that is sold in any considerable quantities direct to retailers. From 85 to 90 percent of all newsprint paper is sold on contract between the mill and publisher.

Geographical Location of Plants.

Current production of primary paper and paperboard is approximately equally divided between self-contained mills and nonintegrated mills. A self-contained mill is one which produces part or all of its own pulp requirements and in many instances produces an excess quan-

[2] L. T. Stevenson, "The Background and Economies of American Papermaking," 1940.

tity for sale. A nonintegrated paper mill depends wholly upon pulp supplies produced by nonintegrated pulp mills, imports, or pulp produced for sale by self-contained pulp and paper mills. Between 90 and 95 percent of total current domestic wood pulp output is produced by companies operating paper mills, the small balance being provided by independent pulp plants.

The factors governing the choice of plant sites vary between self-contained and nonintegrated paper mills. Transportation costs of raw materials are a major item in production costs, an average of four carloads of raw materials being required to produce one carload of paper. As a consequence, the optimum location for a paper mill, other factors permitting, lies in balanced transportation distance of the various raw materials and chemicals to the mill, and of the principal markets for the finished product from the mill. Depending upon whether the mill is nonintegrated or self-contained, and upon the unit value of paper produced, the optimum combination of transportation factors and distances may vary widely.

For a self-contained mill it is highly important that its wood supply be close at hand, but the method of raw material transportation is relatively unimportant so long as the cost is kept at a minimum. In contrast, the nonintegrated mill is most favorably located with reference to its materials if situated on a deep harbor where water-borne shipments of pulp from foreign or domestic sources can be delivered with no transshipment by rail, or where only low-cost rail hauls are involved.

Another locational factor of great importance is the kind and grade of paper made. The quantity and type of labor required for the production of different kinds of paper influences the percentage distribution which direct costs, other than materials, bear to the total cost of production. This may affect location relative to the labor market. In this same connection, in the manufacture of higher grades of paper, raw material costs become less important as other costs rise. This explains the fact that many countries, such as England and France, though distant from adequate wood supplies, are nevertheless of considerable importance in the manufacture of certain high-grade papers.

Other factors besides transportation and labor which influence plant locations are the existence of a large water supply and in many cases the "quality" of the water, the certainty of a continued supply of raw material, and the relation to suitable consuming markets both as regards quality and quantity of consumption.

The pulp and primary paper industry is largely rural with 63 percent of the mills being located in communities of less than 25,000 population. The industry remains relatively concentrated in the New England and Middle Atlantic States where it was originally founded. In 1939 out of a total of 722 paper mills in the country 422 or nearly 60 percent were located in this northeastern region.

Table 1.—United States Production of Wood Pulp and Paper and Paperboard, by Regions, 1930, 1935, and 1940

[Thousands of short tons]

Region	Wood pulp				Paper and paperboard			
	1930	1935	1940	Percent change 1940 from 1930	1930	1935	1940	Percent change 1940 from 1930
Total	4,630	4,926	8,852	+96	10,169	10,479	14,484	+42
Northeastern and Central States	2,089	1,711	2,260	+9	6,305	6,078	7,647	+22
Lake States	1,077	893	1,190	+1	2,400	2,064	2,607	+9
Southern States	658	1,284	3,563	+441	864	1,415	2,984	+245
Pacific States	815	1,038	1,839	+126	600	922	1,246	+108

Source: U. S. Department of Commerce (regional break-down computed by Bureau of Foreign and Domestic Commerce, based upon Bureau of the Census incomplete data by States).

Some specialization of product has developed in various sections of the country. Newsprint production is centered largely in Maine, New York, and Washington, while mills in Ohio, Pennsylvania, Massachusetts, and Michigan specialize in book papers. Tissue paper is made largely in New York, Pennsylvania, and Wisconsin, and the production of wrapping paper and paperboard is mainly concentrated in the Midwest and Southern States. Kraft types of paperboard are produced largely in the South while other types, especially those made wholly or in part from waste paper (such as folding and set-up boxboard), are produced in the North. Production on the west coast is predominantly of wrappings.

Growth of Industry Impressive.

Perhaps the most remarkable phenomenon that has occurred in the pulp and paper industry has been its outstanding growth in the past two decades. One-quarter of all the pulp and nearly one-half of all the paper produced in the world in 1939 was manufactured in the United States.

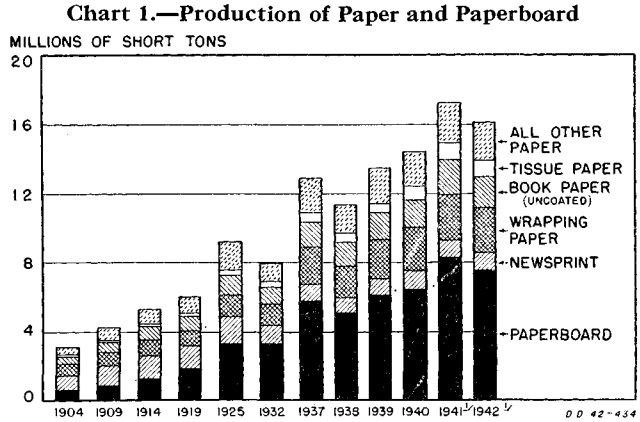
Expansion in the domestic pulp industry has occurred largely in recent years. As late as the decade from 1925–34, domestic annual output furnished only about 71 percent of total pulp supply, the balance coming from imports. In the short space of the last 7 years the total yearly output of United States pulp mills has doubled and in 1941 and 1942 this output provided about 89 percent of the total supply. This trend is particularly outstanding when the large increase in consumption is taken into account. The great expansion in domestic production is in large measure attributable to the development of a new technique for making sulphate pulp from the resinous southern pine tree. Until about 15 years ago this tree was considered unsuited to pulping operations. However, the relatively new process has made abundant supplies of pulp available for the production of heavy wrapping paper and container board. It also served to augment the general trend toward conversion from various forms of shipping containers made of other materials to less expensive paperboard boxes and cartons.

Pulp production has also shown a marked expansion since 1925, especially in Washington and Oregon. Natural advantages of this region include dense forests of spruce, hemlock, and fir situated close to swiftly flowing streams that provide abundant power. Considering the availability of water power and timber resources, the Pacific Northwest has excellent facilities for the manufacture of pulp and paper. Pulp production in the Midwest Lake States has remained stable since 1920, but the percentage of total national output accounted for by these States has fallen from about 80 percent to 37 percent in the past 20 years.

The growth in the paper industry approximately parallels that of pulp, with the period of greatest expansion coming since 1920. (See table 3.) The increase in paper-making capacity was the result of new and larger machines being employed rather than of any great increase in the number of machines. Approximately 1,600 paper machines were in existence in 1940 compared with the 1,370 machines available for use in paper mills in 1904, an increase of only 17 percent. However, modern units producing a much wider sheet at greatly increased speeds had raised annual paper-making capacity from about 2,780,000 tons at the turn of the century to 16,890,000 tons in 1940.

Chart 1 indicates the expansion that has taken place in the production of the principal classifications of paper since 1904. The production of all major classes of paper except newsprint has approximately doubled since 1931. The annual output of tissue paper has risen about 165 percent in the past 10 years, while paperboard manufactures have shown a gain of about 130 percent. The decline in domestic newsprint production which has occurred since 1925 is largely the result of increased Canadian imports. Large forest reserves especially suited for ground-wood-pulp production, abundant water power, and comparatively lower wage levels give Canadian newsprint the advantage of a lower production cost than is possible in the United States. At the present time from 75 to 80 percent of all the newsprint consumed in this country comes from Canada.

Chart 1.—Production of Paper and Paperboard



[1] Estimated.

Sources: Data through 1940, U. S. Bureau of the Census; thereafter, U. S. Bureau of Foreign and Domestic Commerce.

Pulp and Newsprint Imports Major Items in Foreign Trade.

Imports of wood pulp have shown a gradually increasing trend since 1921, but the increase has not kept pace with rising domestic production. (See table 2.)

Table 2.—Wood Pulp Supply and Demand, 1925–41

[Thousands of short tons]

Year	Supply			Demand		
	Production	Imports	Total	Consumption [1]	Exports	Total
1925	3,962	1,664	5,626	5,588	38	5,626
1926	4,395	1,731	6,126	6,092	34	6,126
1927	4,313	1,676	5,989	5,957	32	5,989
1928	4,511	1,755	6,266	6,232	34	6,266
1929	4,863	1,881	6,744	6,690	54	6,744
1930	4,630	1,830	6,460	6,412	48	6,460
1931	4,409	1,597	6,006	5,953	53	6,006
1932	3,760	1,482	5,242	5,194	48	5,242
1933	4,276	1,943	6,219	6,140	79	6,219
1934	4,436	1,806	6,242	6,099	143	6,242
1935	4,926	1,933	6,859	6,687	172	6,859
1936	5,695	2,278	7,973	7,780	193	7,973
1937	6,573	2,395	8,968	8,645	323	8,968
1938	5,934	1,710	7,644	7,504	140	7,644
1939	6,993	2,027	9,020	8,880	140	9,020
1940	8,852	1,225	10,077	9,595	482	10,077
1941 [2]	10,000	(3)	(3)	10,800	(3)	(3)
1942 [2]	10,500	(3)	(3)	11,100	(3)	(3)

[1] Apparent consumption—equals production plus imports minus exports.
[2] Estimated by the Bureau of Foreign and Domestic Commerce.
[3] Figures are not available for publication.

Sources: U. S. Department of Commerce, Bureau of the Census, and Bureau of Foreign and Domestic Commerce; American Paper and Pulp Association; U. S. Pulp Producers Association.

Thus, the ratio of total pulp supplied by foreign producers to total consumption has decreased from about 28 percent to about 12 percent in the last 10 years. Finland, Norway, Sweden, and Canada were the main sources of pulp imports before the war.

Imports of wood pulp into the United States have fluctuated between 1,500,000 and 2,400,000 short tons over the past 15 years. Although domestic production has nearly tripled in the same period and domestic capacity was large enough to meet demands, the European sources have continued to supply this country largely because certain pulps, particularly the unbleached grades, are of a very high quality and were available at attractively low prices. American pulps have been greatly improved over the years, and there is a growing tendency to use these wherever possible. However, for papers requiring special qualities, especially great strength, the foreign pulp has been preferred.

The European trade has ceased, just as it did during the previous conflict in 1917 and 1918, but a substantial amount is still received from Canada.

Approximately 85 percent of the total imports of paper consists of newsprint coming largely from Canada. Otherwise imports of paper compared to total domestic consumption are insignificant.

Prior to 1920, from 20 to 30 percent of United States exports of paper and paper products went to Europe. However, after that date an increasing percentage of

total exports was shipped to Asia, Australia, and Far Eastern regions. This change in the flow of United States world paper trade can be largely attributed to a dislocation of markets resulting from the war, when these areas were cut off from their European sources.

Table 3.—Paper and Paperboard Supply and Demand, 1925–41

[Thousands of short tons]

Year	Supply			Demand		
	Production	Imports	Total	Consumption[1]	Exports	Total
1925	9,182	1,492	10,674	10,578	96	10,674
1926	(2)	1,893	(2)	(2)	124	(2)
1927	10,002	2,036	12,038	11,916	122	12,038
1928	10,403	2,198	12,601	12,451	150	12,601
1929	11,140	2,459	13,599	13,402	197	13,599
1930	10,169	2,306	12,475	12,305	170	12,475
1931	9,382	2,091	11,473	11,343	130	11,473
1932	7,998	1,815	9,813	9,723	90	9,813
1933	9,190	1,823	11,013	10,909	104	11,013
1934	9,186	2,240	11,426	11,293	133	11,426
1935	10,479	2,424	12,903	12,758	145	12,903
1936	11,976	2,821	14,797	14,653	144	14,797
1937	12,837	3,389	16,226	16,040	186	16,226
1938	11,381	2,325	13,706	13,542	164	13,706
1939	13,510	2,672	16,182	15,971	211	16,182
1940	14,484	2,802	17,286	16,774	512	17,286
1941[3]	17,225	(4)	(4)	19,750	(4)	(4)
1942[3]	16,100	(4)	(4)	18,400	(4)	(4)

[1] Apparent consumption—equals production plus imports minus exports.
[2] Data are not available.
[3] Estimated by the Bureau of Foreign and Domestic Commerce.
[4] Figures are not available for publication.

Sources: U. S. Department of Commerce, Bureau of the Census and Bureau of Foreign and Domestic Commerce; American Paper and Pulp Association; U. S. Pulp Producers Association.

Foreign markets have never represented an important segment of demand for paper or pulp produced in this country, as may be seen from tables 2 and 3. In 1919, exports of paper, paperboard and converted paper products amounted to 7 percent of domestic output in terms of value, while in 1929 exports represented only about 2 percent and in 1939 only about 1½ percent. The physical volume of exports, however, has shown an upward trend, increasing from 124,000 short tons in 1920 to 170,000 short tons in 1930, and 512,000 short tons in 1940. Wood-pulp exports have shown a similar trend, decreasing in relation to total domestic production but increasing in export volume in recent years, especially during 1941.

Under present war conditions, the American Republics and some of the other United Nations depend to a major degree upon United States and Canada for imported pulp and paper supplies, whereas in former years Europe was their principal source.

Influence of War on Operations.

In common with other industries, pulp, paper and converted paper products have been placed under the jurisdiction of the War Production Board and Office of Price Administration. This control is to prevent unnecessary maladjustments in inventories and prices, to control critical materials, and to direct that essential pulp and paper products are produced in sufficient quantities.

In terms of plant facilities and capacity the pulp, paper and converted products industry in the United States was better able to withstand the effects of war on December 8, 1941 than when the country entered the first World War in 1917. However, this fact is partly offset by other considerations. Shortages of certain vital materials such as rubber, which are now apparent, did not threaten the industry in 1917 when countries supplying these items were on friendly terms with the Allies. The magnitude of our present war effort far outstrips that of the first World War so that shortages in labor, transportation, power, and other critical materials are developing much sooner and to a more marked degree. The present conflict promises to be of longer duration. As a consequence, regulations regarding pulp and paper manufacture have come much earlier in World War II than in the previous war.

The first general action to affect the industry in World War I came in January 1918, when an economy drive to conserve fuel was inaugurated. The Paper and Pulp section of the War Industries Board was organized in June of 1918. Simplification and standardization orders for wrapping and book papers as well as a 50-percent restriction order against output of paperboard and textbooks were issued in August and September of 1918. These controls were quickly lifted from the industry following the Armistice, with the last of the restrictions being canceled on December 18, 1918.

In contrast, Government controls affecting pulp and paper operations were inaugurated in the early stages of this war. In fact, chlorine supplies available to the industry were restricted prior to Pearl Harbor. General Order M–93 placing rigid restrictions on the pulp industry by providing for a system of pulp allocations was issued on March 14, 1942. Standardization and simplification practices were initiated on July 4, by Limitation Order L–120 which limited the manufacture of certain fine papers to specified grades, sizes, weights, and colors. Thus, in the short space of 8 months individual producers were subjected to regulations that were not applied until nearly a year and a half after the declaration of war in 1917.

Certain characteristics of the industry have brought forth the same problems in both periods of conflict. These problems clearly indicate why Government intervention in the form of control orders on operations have been necessary and why additional orders providing for curtailment and concentration of production are in prospect. Paper production depends on adequate transportation facilities. Logs must be transported from forests to pulp mills; 80 percent of all domestically produced pulpwood goes part of the way to mills by motor truck. Paper mills not integrated with pulp plants sometimes use pulp produced many hundreds of miles away. The paper may then be shipped to plants for conversion into a myriad of paper products. Finally, a substantial portion of the paper and paper products must be distributed to wholesale and retail outlets. In the aggregate, considerable cross-hauling has been

evident—a practice not economic in time of war. Rail, water, and motor transportation are all utilized and a shortage or need for conservation of these facilities calls for adjustment in pulp and paper operations.

Labor shortages also affect the industry. The Pacific Northwest, an important source of wood pulp, has already experienced serious difficulty in obtaining woods labor. The shipbuilding and other new war industries in this region have attracted workers by offering higher rates of pay. In other parts of the country the labor situation shows signs of becoming grave. Labor is the most important single factor causing current Government orders controlling operations within the industry. It promises to be the primary reason, direct or indirect, for further action in curtailment and concentration of production and limitation of uses of products.

Complicated machinery, critical metals, chemicals and other materials are required for the manufacture of paper, and maintenance costs are high. The mechanized character of the industry and the large investment in fixed capital necessary have already been pointed out. The extensive use of water and chemicals in the manufacturing process demand a generous use of corrosion-resistant metals. Large copper screens (Fourdrinier and cylinder wires) are an essential part of every paper-making machine. Their average life on Fourdrinier machines is less than 1 month.

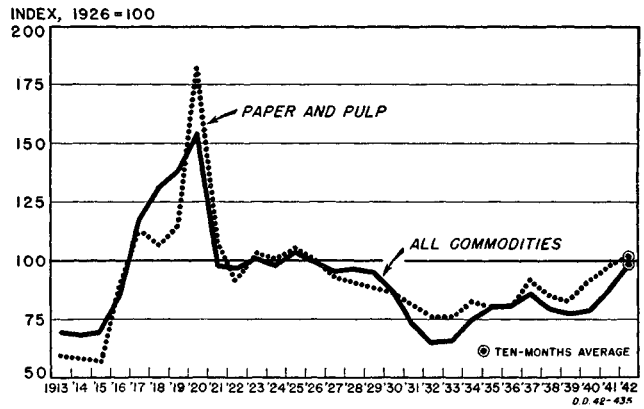
These operating problems and shortages of transportation, manpower, and equipment are common to the industry today just as they were in 1917–18.

Characteristics of Paper Demand.

The all-time peak in paper demand was reached in 1941. That year was also the peak year for the output of goods for the peacetime economy, and it is this factor which largely accounts for the unprecedented consumption of paper. Paper is a complementary product, and as such has a relatively inelastic demand following closely the general demand forces in the entire economy. Its function is largely one of facilitating or aiding in the final using up of other goods and services. The bulk of practically all paper and paper products satisfies indirect rather than direct wants. As individuals we desire clothes, furniture, and other consumer's goods wrapped or packaged in paper, but we care little for the paper itself, except as it adds to the attractiveness of the product. We realize that when we make a purchase the article must be tabulated on an order book, placed in a carton, wrapped with heavy paper, and even paid for with paper money, but still there is little direct demand for paper itself.

These demand characteristics explain why paper consumption is not influenced significantly by its price. Although paper prices have fluctuated rather widely over recent years, there have been no corresponding changes in paper consumption. The demand for paper has shown a steadily rising trend, interrupted only by certain years of recession in general business activity. Paper prices during the past 30 years have been subject to wide fluctuations, with the Bureau of Labor Statistics index of paper and pulp prices (see chart 2) reaching its highest point of over 180 (1926=100) in 1920. This compares with a general downward trend since that year. From 1916 to 1920, paper prices skyrocketed as raw materials, such as wood pulp, rags, and chemicals, which had formerly been imported in substantial quantities from northern European countries, suddenly became scarce.

Chart 2.—Wholesale Prices of Paper and Pulp and All Commodities



Source: U. S. Department of Labor.

During the present conflict, while pulp and paper prices have shown some tendency to rise, there has been no drastic upsurge such as occurred during World War I. This is due to several factors. The industry today is much less dependent on foreign sources for raw materials and paper-making capacity has greatly expanded since 1920. Price ceilings, voluntary at first but now enforced by the Office of Price Administration, have also prevented increases.

These characteristic features of paper demand are also quite significant from the standpoint of its essentiality during wartime when the industry faces certain restrictions. The decline in output of consumers' goods will naturally tend to decrease the consumption of such items as wrapping paper and paperboard, and it now appears doubtful that production of war materials will equalize the loss. Packaging in larger containers and reducing wrappings to a minimum can further decrease paper consumption. At present a multitude of sizes, weights, colors, and other "frills" are used to increase the advertising appeal of paper, and these could be cut to a few relatively simple and standardized grades. Even a sharp reduction in the quantity of newsprint available would not interfere appreciably with the primary function of the newspaper—that of imparting basic news to the public.

Thus, it would appear from the nature of paper demand that its essentiality in wartime can be measured only by its end-use applications taken in relation to the

degree of conservation in labor, transportation, power, and critical materials considered necessary to win the war. No specific formula for curtailment or restriction appears to apply to the primary paper itself. It cannot be denied that paper is vitally essential in many of its uses, but in many other uses it is employed largely as a medium of advertising or decoration.

During wartime the most important application of paper is in the manufacture of war material. For example, it is used in the production and packaging of shells and cartridges. Food and clothing for the armed forces must be properly packaged in cartons for shipment to combat areas. Various types of writing and specialized papers are essential for carrying orders, maps, photographs, and blueprints utilized in the administration of war. Generally speaking, paper and paperboard manufactured for military requirements could easily be adapted to civilian needs, and vice versa. Thus, control over distribution is relatively as important as regulation of output in order to meet first military needs, and secondly, essential civilian requirements.

The Paper Situation in Recent Months.

Around the first part of 1941 there was persistent talk of shortages developing in various goods or materials. Paper or paperboard was no exception. Thus, speculative purchasing was superimposed upon the legitimate larger demand caused by the rise in industrial and general economic activity due to defense spending.

As a result, orders received by paper mills skyrocketed in March 1941 and continued at high levels for several months. During this period the demand for paperboard also increased sharply, but in order to utilize fully the capacity of the board mills, there was need for vast quantities of old papers, especially old newspapers, which constitute about 60 percent of the fibrous raw material used by paperboard mills. (See table 4, which shows the large quantity of waste paper and other fibrous materials in addition to wood pulp, which are used in the production of paper and paperboard.)

Table 4.—Fiber Consumption in Paper and Paperboard

[Thousands of short tons]

Item	1929	1939	1941 [1]	1942 [1]
Total fiber consumption	11,574	14,176	18,575	18,000
Wood pulp	[2] 6,289	[2] 8,650	10,800	11,100
Manila stock [3]	129	64	(4)	(4)
Rags	739	468	550	550
Waste paper	3,842	4,366	6,500	5,700
Straw	575	513	575	500
Other fiber [5]	(6)	115	150	150

[1] Estimated.
[2] Does not include non-paper-making wood pulp consumption.
[3] Includes rope, jute, bagging, etc.
[4] Due to war requirements for cordage, the use of manila fibers for paper has been curtailed.
[5] Includes cotton and similar fibers.
[6] Not reported.

Source: U. S. Department of Commerce—1929 and 1939, Bureau of the Census; 1941 and 1942, Bureau of Foreign and Domestic Commerce.

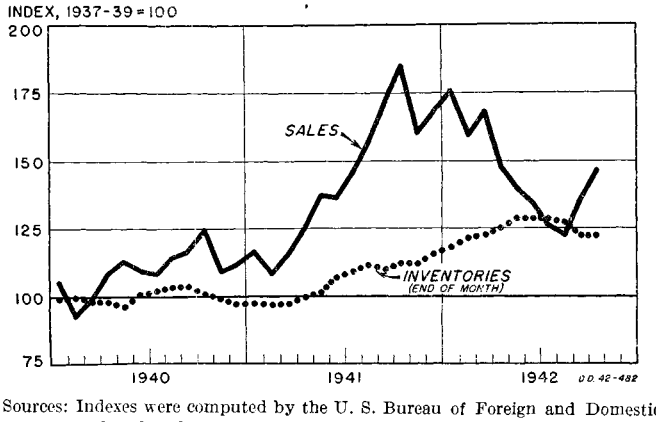
Both the privately financed and the Government salvage programs asked public cooperation in collecting paper. Aided by the cooperation of the schools and various agencies, increasing quantities began to pour into dealers' yards for sorting and shipping to paperboard mills. So successful was this program that not alone were the board mills able to step up operations to capacity but by the spring of 1942, when demand for board commenced to sag, large wastepaper surpluses accumulated.

This collection program quite innocently further stimulated the rumors of a paper shortage, chiefly because the raw material—waste paper—was confused with paper, the manufactured product. Thus, as the public and merchants became conservation conscious, there was a tendency to use less paper, yet at the same time the trend to "stock-up" continued.

In the meantime, the paper industry brought into operation idle plants and machines, with the result that by October 1941 paper output exceeded orders. For several months during the latter part of 1941 and the early part of 1942, paper output in the United States was the highest ever recorded, running over 100 percent of estimated 6-day three-shift capacity. Beginning about April 1942 the situation which existed from March 1941 to March 1942 reversed itself, with new orders placed at mills steadily decreasing to a low point of around 60 to 70 percent of capacity in June and July. Thus, both paper and paperboard mills were able to reduce the backlog of unfilled orders accumulated during the months of peak buying and as a consequence production also dropped from around 100 percent of capacity in April to around 70 percent in July.

This downward trend was largely due to the conversion of many consumer-goods industries to war products and the heavy inventories accumulated in the warehouses of most consumers and distributors. (See chart 3 which shows the trend in wholesalers' inventories.)

Chart 3.—Wholesalers' Sales and Inventories of Paper and Paper Products, Without Adjustment for Seasonal Variations



Sources: Indexes were computed by the U. S. Bureau of Foreign and Domestic Commerce and are based upon data reported to the U. S. Bureau of the Census.

Current Developments.

Following the low points in both demand and production reached in July, which were in part seasonal, a moderate recovery took place in August and September. However, October witnessed a sudden sharp rise in new orders up to around 90 to 100 percent of capacity. This rise was brought about by a combination of factors such as increased needs for direct and indirect war purposes, speculative purchasing caused by expectations of WPB action on curtailment of production, gradual dwindling of large inventories of consumers accumulated over the previous several months, and a general seasonal pick-up. By the end of October production of paper (exclusive of paperboard or newsprint) increased to over 90 percent of capacity (about 9 percent above September) and for paperboard about 85 percent of capacity (about 13 percent over September), both on a tonnage basis.

The first step in the curtailment of paper and paperboard production in North America and the use of paper products was taken the last day of October by what is now commonly referred to as "the paper freeze order."

Production of all papers and paperboards (except a few designated building boards and specialty products) in the United States is limited each month, beginning with November, to an amount not in excess of the monthly average production of individual mills for the 6-month period, April to September, inclusive. Similar action in Canada froze the production of newsprint and magazine paper at the same 6-month average level.

This action was taken simultaneously by the War Production Board under General Conservation Order M–241, and Canada's Wartime Prices and Trade Board under orders A–454 and A–455, effective November 1, 1942. Officials of both the War Production Board and the Wartime Prices and Trade Board anticipate further curtailment in paper and paperboard production in the near future.

Regarding these orders the United States War Production Board stated in part: "The immediate freeze of production is the first step toward a balanced program of further reduction and concentration of the industry on an international basis. The ultimate object is to reduce the production of paper products down to an essential level, and thereby to release for war purposes, labor, power, transportation and materials."

Other significant features of the United States "freeze order" were: Restrictions on distributors' and consumers' inventories to a 90-day maximum; no mills to resume operations which were not in operation since August 1, 1942; and the option for companies operating more than one mill to submit proposals to the War Production Board for combining production quotas. This latter point is especially interesting since it offers considerable possibilities for the adoption of efficient plans for "voluntary concentration" being submitted by industry for consideration of the War Production Board.

In addition to the paper-freeze order discussed above, other far-reaching Government orders have been issued in recent weeks. General Preference Order M–251 authorizes the War Production Board to control the Nation's pulpwood supplies whenever need arises in any area; OPA Order M. P. R. 257 placed ceiling prices on pulpwood in the Lake States; WPB Limitation Order L–209 places closer control over copper wires for Fourdrinier and cylinder machines; while ODT Order 21 requires certificates of necessity for trucks hauling pulpwood, pulp, paper, or other commodities after November 15. Revision of L–120 increases the effectiveness of the standardization and simplification program for a group of fine papers. Last, but not least, the new Controlled Materials Plan (C. M. P.) may eventually play a very important role in the operations of the industry, although it is yet too early to indicate any details of its probable effects.

Pacific Northwest Problem.

The situation which has developed in the pulp and paper industry in the Pacific Northwest area is perhaps a forerunner of similar difficulties liable to be encountered in other producing areas. During the summer months labor shortages were handicapping woods operations while at the same time demands for logs by the sawmills were increasing. Lumber was designated as a critical material, thereby justifying the sawmills in seeking priorities on available log supplies. During this period pulpwood inventories at pulp mills were dwindling to a point where the production of high alpha, dissolving and other essential pulp grades was seriously threatened.

The situation became acute following action by British Columbia on September 1, restricting the exportation to the United States of western hemlock and certain other species of logs commonly used by pulp mills. Following temporary and voluntary measures to ease the situation, the War Production Board issued pulpwood Order M–251, effective October 26, 1942. This order was immediately followed by issuance of Schedule 1 to M–251 which declared the Puget Sound area a "critical pulpwood area"; defined the area and the types of pulpwood termed "critical"; and froze the pulpwood inventories of mills in the area.

Under M–251 pulpwood was withheld from three pulp mills in the Puget Sound area and reduced allocations of logs were granted to the remaining Puget Sound mills. This resulted in a concentration of production in the area, thereby providing sufficient log inventories for the mills manufacturing high-alpha, dissolving and other essential pulps.

Due to the similarity of factors operating in the adjacent Columbia-Willamette area it appeared advisable for the War Production Board to take some action

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before the situation in that area reached dangerous proportions. Consequently, Schedule 2 to order M–251 was issued. Schedule 2 declares the Columbia-Willamette area "critical," defines the area and types of pulpwood termed "critical" and provides for the allocation of pulpwood in this area where and if the War Production Board determines that such allocations are needed.

To compensate for the reduced west coast production of paper-making pulps, part of which was formerly shipped to eastern paper mills, the War Production Board through application of the wood pulp allocation order M–93, has found it desirable to direct numerous changes in the distribution of pulp to consumers and, in particular, to withhold west coast paper-making pulps for use of west coast paper mills and to meet Lend-Lease and export commitments. The only pulp currently moving East will consist of high-alpha and dissolving pulps which are consumed largely in the rayon industry and in the nitrating plants for ordnance purposes.

Outlook for Future.

For November, and future months, production of paper cannot exceed 87 percent of capacity, and for paperboard not more than 78 percent, which were the relative average monthly operating ratios for the industry in the base 6-month freeze period as reported by trade associations. However, since some mills, especially in the paperboard industry, were shut down in August, September, and October (and according to the freeze order cannot again resume production) the actual "future capacity" of the industry will be less than cited unless additional exemptions to the order are issued.

Public announcements of the War Production Board indicated that an over-all plan for the integration of the pulp and paper industries of Canada, Newfoundland, and the United States will soon be applied. Such a plan will undoubtedly encompass curtailment and concentration in specific types of pulp and paper production and limitation orders on production or consumption of specified end products such as boxes of certain types, newspapers, magazines, wrapping papers for civilian uses, and a multitude of others. One of the first orders on paper end products (General Limitation Order L–177), issued November 13, 1942, restricted production of wallpaper in the 1942–43 season to not more than 50 percent of the 1941–42 season, limited the number of patterns to be produced, and laid down other specified restrictions.

The chairman of the War Production Board on November 19 disclosed at a press conference that production of paper may be curtailed anywhere from 50 percent of recent output for one type to an expansion of 5 percent for another type. In this connection it is interesting to observe the experiences of Great Britain.

Table 5.—Production and Apparent Consumption of Wood Pulp and Paper and Paperboard, 1937, 1939, 1941, and 1942

[Thousands of short tons]

Item	1937	1939	1941 [1]	1942 [1]
PRODUCTION				
Wood pulp	6,573	6,993	10,000	10,500
Paper and paperboard	12,837	13,510	17,225	16,100
Newsprint	976	954	1,000	950
Groundwood printing	518	540	650	550
Book paper	1,510	1,535	2,000	1,800
Writing paper	578	595	700	700
Wrapping paper	2,053	2,239	2,700	2,650
Tissue paper	540	666	975	950
Absorbent paper	138	122	100	100
Building paper	608	659	750	750
Paperboard	5,802	6,105	8,250	7,550
Other paper	114	95	100	100
APPARENT CONSUMPTION [2]				
Wood pulp	8,645	8,880	10,800	11,100
Paper and paperboard	15,798	15,930	19,750	18,400

[1] Estimated.
[2] Apparent consumption equals production plus imports minus exports; no adjustment for stocks.

Source: U. S. Department of Commerce—production, 1937 and 1939, Bureau of the Census; other data, Bureau of Foreign and Domestic Commerce.

Restrictions in England.

It is estimated that aggregate consumption of paper and paperboard in England has been reduced to around 40 percent of pre-war levels, while in the case of news bulletins, magazines or similar periodicals, the most recent order restricts consumption to 6½ percent of the pre-war. Newspapers are limited to 15 percent of pre-war consumption. These figures indicate the degree of curtailment which is possible under "all-out" war conditions.

However, conditions in the United States cannot be likened exactly to those in the United Kingdom. The British paper industry depends in large measure upon imported raw material requiring ocean shipping space, whereas in this country we are practically self-sufficient and the relative need for curtailment and restriction in use is not strictly comparable.

On the other hand, the present rapid expansion in development of new uses of paper as substitutes for critical materials will require that careful consideration be given to the degree of aggregate curtailment of pulp and paper production. Such developments, moreover, are likely eventually to bring more rigid controls on nonessential civilian uses of paper than might otherwise be necessary. The outlook for pulp and paper supplies definitely calls for immediate conservation in the use of all types of paper and paperboard even though no acute shortages appear imminent.