THE HOLYOKE AREA PAPER INDUSTRY

1899 - 1951

By

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But words are things, and a small drop of ink,
Falling like dew, upon a thought, produces
That, which makes thousands, perhaps millions, think;
'Tis strange, the shortest letter which man uses
Instead of speech, may form a lasting link
Of ages; to what straits old Time reduces
Frail man, when paper - even a rag like this,
Survives himself, his tomb, and all that's his.

Lord Byron

Preface

My purpose in writing this paper has been to present an historical-economic account of the Holyoke paper industry as it has functioned since 1899. This date was not arbitrarily selected. This was the year that the American Writing Paper Company was formed. From the moment of its birth it presented problems and produced changes in the local paper industry. The importance of this event to the Holyoke paper industry can only be understood when it is studied over the years since its inception. This is the first direction which this study shall take.

The other main part of the study is centered around the independent paper companies which existed both before the "trust" began operations and since that time. These were the long established, predominantly family-owned, companies which were faced in 1899 with the problem of competing successfully with the newly formed gigantic "trust." How these companies continued to exist down to the present is the other major line of research about which this paper will concern itself.

The contrast between the small independent companies and the large corporation is affected by many factors in the period of this study. Probably the most important factor has been the growth of the paper industry on a nation-wide basis. The many mechanical and chemical changes which have

taken place in the past fifty years have resulted in a shift of demand away from the types of paper made by the local paper companies. How the managements of both the "trust" and the independents have adjusted to this change is one important consideration which had to be faced in my investigations.

Other major events affecting the local companies were the impact of two major wars and the most severe depression in the history of our country. How the "trust" in comparison with the independents was affected by these events is another major consideration.

Throughout the study the contrast between the two main types of business organization and the management behind each is always apparent. The changes which have taken place and which are continuing to occur in this important phase of the local industry will have a considerable effect in the future. It is my sincere hope that these effects will be beneficial for the Holyoke paper industry.

For most valuable assistance in accomplishing the objectives of this study I wish to thank the persons named in the list on pages 153 and 154.

ACKNOWLEDGEMENTS

The author wishes to express his most sincere appreciation to the members of his thesis committee, Professor William Haller, Jr., Professor J. Harry Rich and Professor William A. Davis who read all parts of the original manuscript and submitted many helpful criticisms. All responsibility for the entire study and the opinions expressed is assumed by the author.

John P. Hickey

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CHAPTER I

Development of the Paper Industry and the Formation of the "Trust"

The Holyoke Area paper industry, which was established in 1848 when Joseph Carew organized the Carew Manufacturing Company, grew consistently throughout the following fifty years. The first paper mill established in the City of Holyoke was the Parsons Paper Co. which began operations in 1853. After this first mill had successfully operated for several years, other paper mills slowly moved into sites along the canals. By 1873, just twenty years after the first Holyoke paper mill was established, there were fifteen paper mills being operated by fourteen companies. The total daily capacity of these mills was 48.5 tons.[1] In 1897 the number of companies had risen to twenty-one, and there were twenty-six mills being operated by them. The total daily capacity had increased to about 320 tons. The number of paper machines had increased from three Cylinders and sixteen Fourdriniers in 1873 to seven Cylinders and fifty-six Fourdriniers in 1897.[2] It is little wonder then that Holyoke became known as the "Paper City of the World."

There were several important reasons why the paper industry established itself in the Holyoke Area. Not the least of these was the Holyoke dam and canal system. The Connecticut

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1. Louis H. Everts, History of the Connecticut Valley in Massachusetts (Philadelphia, 1879), II, 918-921. Orra L. Stone, History of Massachusetts Industries (Boston: The S. J. Clarke Publishing Co., 1930), I, 575-580.

2. Western New England 3(7):310.

River, just one and one-half miles above the city, begins to fall in its winding course. It is imprisoned between high banks and drops about sixty feet until it reaches the city. At this point in 1848-49 the Holyoke Dam was constructed.. At the same time a three-level canal system was built adjacent to the river.[1] The plan was to lead the water backed up by the dam through a gatehouse to the canals and into the river again below the city. Along the canals mill sites were laid out with water wheels installed. The water passing beneath the mills provided the power to turn the wheels and the machinery of the paper and textile mills. As a result of this arrangement, the heavy machinery in the various mills could be operated at a minimum of cost and effort. It was a remarkable plan, and it has worked efficiently down to the present time.

A second important reason for the establishment of paper mills in the Holyoke Area is supplementary to the one already mentioned. One of the principal ingredients of paper is water. It is used to carry the cellulose to the wire and rollers of the paper machine and for scores of other auxiliary operations in the paper mill. It has been estimated that, in order to make one ton of paper, it requires 100,000 gallons of water.[2]

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1. Anna U. Scanlon, History of Holyoke, Massachusetts, Holyoke Public Schools, 1939, pp. 13-24.

2. Helen U. Kiely, Paper Facts, taken from a chart listing amounts of water used in paper mills which was in Part IV of a collection of personal papers collected and filed by Helen U. Kiely during her many years of employment with the American Writing Paper Company.

The Connecticut River and the canal system in Holyoke provided the paper producers with an abundant supply of water. In addition, the papermakers of the area discovered that the acidity content of this water was just right for manufacturing paper. Chemical treatment of the water was unnecessary, and this was a great convenience to the local mills.

The cost advantages derived from cheap continuous power and pure process water were most influential in bringing paper mills to the Holyoke Area. Other important considerations were the proximity of the mills to a good supply of rags. The textile industry of the region provided abundant quantities of cuttings which are the most useful type of rags for the manufacture of paper. Transportation facilities included a railroad and good roads, and, since freight transport was relied upon heavily, this was also an important consideration. For the several reasons mentioned above, the paper industry in the Holyoke Area grew and prospered during the first four decades of its existence.

The local paper mills established a reputation for producing high-grade writing papers of all kinds. Most of the mills were rag content fine paper mills. When wood pulp came into use as a raw material, several local mills began making cheaper papers. Even at the turn of the century the major part of Holyoke's paper output was rag content papers. Late in the nineteenth century, several mills switched to making board and they have continued to do so down to the present. Although they would not be considered so today, several of the

local mills were quite large, employing 200 or more workers. In all, about 3700 workers were employed in the local paper industry at the turn of the century.[1]

Family ownership of many of the paper companies had been the rule since they were founded in the 1860's and 1880's. The founders of the companies would pay off their initial debt and then, by putting earnings back into the company, they would finance any additional expansion. With very few stockholders and little need for outside financing, the paper company that was family owned had reached by 1900 a prosperous point in its development.[2]

The depression years in the middle 1890's placed several of the Holyoke paper companies in difficult financial positions. The competition in the fine paper field had increased greatly since the Civil War. The industrial expansion in the 1870's and 1880's resulted in sharp competition throughout the paper industry. The paper manufacturer had been trying to solve the problem of price reductions for some time. Production regulating and price strengthening agreements were known as far back as the 1860's. By 1899 the use of business combinations had become common, and paper producers now turned to this method to solve their problem.[3]

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1. Constance M. Green, Holyoke, Massachusetts - A Case History of the Industrial Revolution in America (New Haven, 1939), p. 213.

2. Ibid., pp. 82-92.

3. Ibid., p. 145. Holyoke Transcript, January 3, March 28, 1874 and June 26, November 20, 1875.

What better place to organize a large homogeneous combination than in Holyoke, where so many mills were located, most of which made fine papers? In 1899 the idea of promoters, who had tried for several years to interest various owners of paper mills in Holyoke in their plan, was realized. The American Writing Paper Co. was formed in July 1899 as a corporation under the laws of the State of New Jersey.[1] The men heading the company were bankers and financiers who either owned a small interest in one or two of the local paper companies which the trust purchased, or were interested in investing in order to obtain interest on their bonds or dividends on their stock. Both the original promoters and the final agents were brokers and not paper manufacturers. The result was that these men were primarily interested in marketing the stocks and bonds, and not one was concerned with the manufacture of paper.

When first approached, the Holyoke mill owners refused to sell. The downturn of business in the middle 90's put several companies in precarious financial positions, however, and made their owners more receptive to the idea of selling the companies. One by one companies were sold in 1898 and early 1899. The companies were bought out by the "trust" in most instances. Other company owners were given stock in the

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1. History and Property of American Writing Paper Co. Inc., Holyoke, Massachusetts, pamphlet in Holyoke Public Library, written May 18, 1933. Hereafter referred to as History of American Writing.

"trust." Several of the companies in more favorable financial positions held out long enough to get substantial sums of money for their plants. Several of the companies were able to receive much more than they were really worth because of the age of the plant. By July 1899 there were fifteen paper companies in the "trust." At the very end of negotiations a large well-equipped company was added to the total by one of the Newton brothers, who received only stock certificates in return.[1] The total then became sixteen paper companies with eighteen plants. Along with the paper companies in Holyoke, there were thirteen out-of-town paper companies that were purchased by the "trust." These companies were scattered from Lee, Massachusetts to De Pere, Wisconsin.[2]

The large number of mills and the concentration of so many in one area made the company somewhat distinctive. When it was organized, and for a few years after this time, the "trust" controlled seventy-five per cent of the total fine paper output of the United States. In the Eastern part of the United States control reached as high as eighty per cent of the total fine paper production.[3] The "trust" was a monopolistic giant in the paper industry. It was well suited to undertake the job of price leadership and production control which its owners believed would result in more stability of

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1. Green, Holyoke, Massachusetts, pp. 192-93.
2. History of American Writing.
3. Western New England 1(1):7-8.

production and profits throughout the industry. The remaining independent paper companies in Holyoke numbered six, and these were expected to join the "trust" after they had observed how successful it was. A complete picture of the Holyoke paper industry in 1900, after the formation of the "trust," would show a total of twenty-two paper mills. Sixteen of these would be found in the "trust," and six still remained independent companies.[1]

The American Writing Paper Co. assumed the role of the largest and most influential business organization in the City of Holyoke after its formation. While the textile companies in the city were large, they were far less numerous than the paper companies. Developments in the paper industry were still the most important industrial events in the city. More workers, capital and production were affected than any other industry in the area. Since it was so large and impressive looking on paper, the "trust" was expected to bring many economic benefits to the city as well as the entire paper industry. However, difficulties within the "trust" were encountered soon after the twentieth century began; and the great concern never seemed to be far removed from difficulties after that time.

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1. Holyoke City Directories 1898-1902 (Manufacturing Section).

CHAPTER II

The "Trust" from 1900 to 1930

As it was originally formed in 1899 with thirty-one mills scattered throughout the Northeastern section of the country, the "trust" was a very loose organization. Most of the mills had been independent paper companies before they were sold, and their individual managements were still running the mills after they became members of the "trust." The main office was in Holyoke where sixteen of the mills were located. A gap existed, therefore, between the practical paper makers, who were running the mills, and the executives, who were principally financiers and who knew little about the practical aspects of papermaking. The practical manufacturers gave up trying to do things the way they thought best and simply took orders or dropped out of the "trust" to take other jobs. Mr. George C. Gill, who was a vice-president of the "trust" for a few years, went into the field of banking.[1] Also, Clifton Crocker and Frank Elwain withdrew from their executive positions within the "trust" and decided to begin their own paper mill. This they did very successfully, as we shall see. The responsibilities of running the mills were great, and the men assuming them did not shoulder the burden capably.

It is indicative of the fluctuating and contradictory policies followed by the management of the "trust" that in 1903, when the employees asked for higher wages, they were

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1. Green, Holyoke, Massachusetts, p. 193.

Table I

List of Companies Incorporated into the American Writing Paper Company under the laws of the State of New Jersey, June 30, 1899

1. Agawam Paper Co. Mittineague, Mass.
2. Albion Paper Co. Holyoke, Mass.
3. Beebe and Holbrook Paper Co. Holyoke, Mass.
4. Chester Paper Co. Huntington, Mass.
5. Connecticut River Paper Co. Holyoke, Mass.
6. Crocker Manufacturing Co. Holyoke, Mass.
7. George R. Dickinson Paper Co., Holyoke, Mass.
8. Eaton May and Robbins Paper Co., Lee, Mass.
9. Esleek Paper Co. Holyoke, Mass.
10. G. K. Baird Paper Co. Lee, Mass.
11. George C. Gill Paper Co. Holyoke, Mass.
12. Harding Paper Co. Franklin, Ohio
13. Holyoke Paper Co. Holyoke, Mass.
14. Linden Paper Co. Holyoke, Mass.
15. Massasoit Paper Co. Holyoke, Mass.
16. Mt. Tom Paper Co. Holyoke, Mass.
17. Nonotuck Paper Co. (2 mills) Holyoke, Mass.
18. Norman Paper Co. Holyoke, Mass.
19. Oakland Paper Co. Manchester, Conn.
20. Parsons Paper Co. Holyoke, Mass.
21. Platner and Porter Paper Co. Unionville, Conn.
22. Riverside Paper Co.(2 mills) Holyoke, Mass.
23. Shattuck and Babcock Co. De Pere, Wis.
24. Springdale Paper Co. Springfield, Mass.
25. Syms and Dudley Paper Co. Watervliet, Mich.
26. Hurlburt Manufacturing Co. South Lee, Mass.
27. Wauregan Paper Co. Holyoke, Mass.
28. Windsor Paper Co. Windsor Locks, Conn.
29. Hurlburt Stationary Co. Pittsfield, Mass.

Source: History and Property of American Writing Paper Co. Inc., Holyoke, Massachusetts, pamphlet compiled by American Writing Paper Company, 1933, pp. 1-3.

informed that the $50,000 annual increase in wages which would result from these demands would be much more than the trust could afford to pay. A strike resulted from this refusal, and another demand by the workers for shorter hours. Just one month after the strike was finished a wage increase was granted by the company, which was substantially like the one requested by the workers.[1] It was essential to the success of the trust that labor troubles be avoided, and poor management on the part of the trust helped precipitate such costly strikes. Between the years 1902-1905 strikes and other labor troubles cost the fine writing paper mills of the trust about 10,000 tons of output.[2]

The American Writing Paper Company, with a dominance over the entire writing paper industry of the United States, was faced with other problems. After a highly successful year in 1902, when net earnings of the "trust" were so high that a payment of five per cent on the cumulative preferred stock was sanctioned, the disastrous and lengthy strike of 1903 helped to make the executives of the company more conservative. When a proposal for spending a large sum of money on improvements was made in 1903, it was promptly rejected.[3] The officials of the company were more concerned with reducing the bonded indebtedness which was the result of great overcapitalization

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1. Holyoke Transcript, June 7, 15, 28, July 8, 1901.
2. Western New England 3(7):310-312.
3. Green, Holyoke, Massachusetts, p. 228.

from the very inception of the trust. The independent paper manufacturers soon realized the "trust" was more concerned with reducing indebtedness than with modernizing plants and equipment and, thereby, maintaining control of the market, which, after all, was the purpose for the formation of the "trust." The executives of the company were used to thinking in terms of thousands of dollars; but when a million-dollar-plus spending program was put forth, they could not think in terms of the size of the "trust."

At the end of 1906 it was clear that the "trust" had lost the sought-for domination of the writing paper market. Competition with independent mills had to be faced, and this form was growing. No better evidence of keener competition could be cited than the new Crocker-McElwain Company which was directly competing with the "trust" both in Holyoke and in the market for fine papers generally. Dividends had not been paid on the common stock since the "trust" was formed; and in 1907, when the directors decided to reduce the capital stock from $25,000,000 to $22,000,000, not enough stockholders could be located to form the necessary majority.[1] It is little wonder, then, that as early as 1905 recapitalization and reorganization were being talked about for the "trust."

After several years of profitable operations, the American Writing Paper Company was caught in the money panic of 1907. The depression which followed the panic lasted for several

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1. Green, Holyoke, Massachusetts, p. 230.

years, and orders dropped drastically. A building program of limited dimensions was immediately abandoned by the "trust," thus increasing unemployment and delaying business recovery. In 1908 a serious water shortage developed in the Connecticut River, and non-permanent mill power owners suffered because steam power had to be substituted, and this method of power manufacture was much more costly.[1]

As 1909 drew to a close conditions in the paper industry improved, and in the period 1910-1912 business was very good.[2] Both the independent mills and the "trust" made money. Looking at the dividend history of the "trust," we find dividends paid on the preferred stock in the following years:

1908 - 2%	1911 - 2%
1909 - 1%	1912 - 2%
1910 - 2%	1913 - 1%[3]

These payments are placed in their proper perspective by the fact that the cumulative preferred stock had a seven per cent dividend rate, and the nearest the "trust" ever came to that was five per cent. No dividends on the common stock had ever been paid. Despite these profitable years, the recession of 1913-1914 hurt the "trust" severely.

Raw material prices rose in 1913, and again in 1914 with

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1. Green, Holyoke, Massachusetts, p. 231.

2. See Table II, p. 13.

3. Green, op. cit., p. 231, fn. 10.
Holyoke Transcript, February 16, August 19, 1910; February 8, 18, 1911; December 19, 1912.

Table II

Principal Data for the Holyoke Paper Industry

(for selected years) 1907 - 1950

Year	No. of Est.	Capital Invested in Production	Value of Stock and Materials	Wages Paid	Average Yearly Earnings	Product Value	Average No. Wage Earners Employed
1907	24	$ 8,717,593	$ 7,780,074	$2,196,952	$ 482.74	$12,862,445	4,551
1909	23	14,036,314	7,243,648	2,210,881	493.50	12,304,800	4,480
1910	21	12,946,923	7,781,939	2,194,477	500.22	12,589,948	4,367
1912	22	13,636,252	8,300,732	2,486,941	538.77	13,706,646	4,616
1913	21	14,094,157	8,615,521	2,508,014	537.16	13,724,604	4,669
1914	21	13,885,129	8,271,811	2,486,794	530.34	13,178,525	4,689
1916	21	14,930,670	10,943,524	3,004,830	694.44	20,386,071	4,327
1919	20	26,738,884	13,011,879	4,043,999	1,114.66	21,375,894	3,628
1921	21	N.A.	10,516,538	3,369,280	853.41	14,415,924	3,948
1924	21	27,609,292	12,626,369	4,466,251	1,182.05	21,501,678	3,819
1926	22	26,397,559	13,966,638	4,760,033	1,253.96	24,494,985	3,796
1928	20	25,952,092	10,887,546	4,276,151	1,177.03	20,925,133	3,633

1930	17	$23,189,870	$ 8,793,885	$3,655,988	$1,252.47	$17,335,478	2,919
1932	15	16,851,460	3,662,569	1,975,018	912.24	8,223,470	2,165
1934	15	14,648,881	4,943,600	2,212,085	945.73	10,176,462	2,339
1935	15	N.A.	6,421,173	2,619,556	1,026.47	12,199,089	2,552
1936	15	16,086,715	7,081,560	2,893,136	1,171.78	13,980,242	2,469
1938	15	16,240,894	6,389,097	2,637,261	1,119.38	12,603,875	2,356
1940	15	16,367,005	7,245,253	2,795,935	1,209.83	14,596,711	2,311
1942	14	16,055,185	9,740,136	3,774,032	1,595.11	19,841,301	2,366
1944	14	18,835,670	11,194,394	4,372,836	2,050.08	22,611,666	2,133
1946	14	19,846,826	14,249,586	5,330,785	2,292.81	27,018,245	2,325
1947	14	N.A.	20,758,425	6,480,216	2,646.06	34,609,164	2,449
1948	14	20,941,048	18,292,920	5,762,434	2,593.35	29,545,378	2,222
1949	14	20,048,535	14,084,934	5,309,943	2,572.64	25,508,367	2,064
1950	14	22,278,764	17,378,443	5,960,167	2,943.29	30,921,170	2,025

Source: Census of Manufactures (selected years) Holyoke, Massachusetts Paper Industry, Commonwealth of Massachusetts, Department of Labor and Industries.

the outbreak of World War I in Europe. Rags were imported in large quantities by many of the mills in the United States, and the scarcity from 1913 on forced prices to very high levels. In the same period the revenues of many mills were reduced by a lessening of demand brought about by overproduction in the preceding four years. Thus, costs were rising and sales decreasing. This situation was most oppressive to the writing paper and book paper manufacturers because many of their raw materials were imported. Besides rags, large quantities of wood pulp, clay, bleaching ingredients and paper machine wires were imported.[1]

The Holyoke mills were, of course, affected adversely by these events. The American Writing Paper Company was affected more than the independents because of its size. A very severe drought in 1913 forced increased use of coal for steam and, consequently, operating costs took another jump. In 1914 the water situation was only slightly better, and prices abroad were worse as the war actually began. The result was a $100,000 deficit by the end of 1914.[2] In 1915 the "trust" was unable to meet the interest on the bonds, and the directors submitted to reorganization.

In the course of reorganizing, both the bondholders and stockholders of the "trust" had surveys made to determine the exact condition of the company so future policy could be de-

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1. Holyoke Transcript, August 10, 1914.

2. Ibid., August 10, 14, 1914.

cided upon. The bondholders hired an experienced engineer, Mr. John G. Callan, to make the survey for them. He produced the best economic report on the "trust" ever written. The report was submitted in 1915. Mrs. Green, in her book "Holyoke, Massachusetts," interprets the "Report to The Bondholders" Committee of the American Writing Paper Company by John G. Callan as follows:

> The report to the bondholders' committee contended that real estate, plant and equipment were adequate security to cover the amount of the outstanding bonds, provided there was neither forced sale nor complete shutdown. Responsibility for the sorry state of the company, the report continued, had to be fairly placed upon the old management. Though the men operating the company were able manufacturers, they had failed to grasp the need of large-scale, closely coordinated operations and a wide view of business opportunities and demands. The incentives of individual proprietorship were gone, and no reward to initiative and conspicuous ability had been substituted. No one knew which lines were profitable and which were not, or, more than in a very general way, what each mill could best make. Closer cooperation, broader vision, properly kept costs, and incentive to hard work by recognition of ability were essential for success in the future, whether the financial problems were met or not.[1]

It is clear that the engineer, Mr. Callan, understood the poor management and financial position of the "trust."

Mr. Callan's recommendations for reorganizing the American Writing Paper Company were only partially carried out, however, because of differences between the bondholders and stockholders. The former wanted a curtailment of salaries and running expenses, and the latter wanted a scaled-down value

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1. Green, Holyoke, Massachusetts, p. 233.

on the bonds of the "trust." The reorganization was held up for a time because these two groups could not be united in taking some concerted stand.[1] In the meanwhile, 1916 had been ushered in, and the dispute was brought to an end by a genuine strong increase in the demand for paper. This increase in demand is evidenced by the fact that at one time during 1918 the mills of the "trust" were operating at 150 per cent of rated capacity.[2] As the orders increased steadily and the individual mills of the "trust" began operating at capacity-plus, a strong feeling of optimism within the company gave hope that the "trust" was once again to play a successful role in the paper industry in the Holyoke Area.

The "trust" about this time was made up of thirteen divisions with fifteen mills in Holyoke. Besides these, there were ten divisions with thirteen mills outside of Holyoke. Actually the "trust" had been reduced by two divisions in the years since it was founded. One division had been merged with another to form one large mill. The other division was dropped from the "trust," and no record of it is available.[3] The relative position of the "trust" in the local paper industry and in the paper industry throughout the country is expressed in the following tables:

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1. Green, Holyoke, Massachusetts, p. 233, fns. 13, 14.

2. Holyoke Transcript, January 15, 17, June 21, July 18, August 5, 1918; December 3, 1919. See "Explanation of Rated Capacity" in Appendix B, p. 147.

3. History of American Writing.

Table A[1]

Holyoke Paper Industry 1910

Total Capacity All Holyoke Mills . . .	.381	Tons Daily
Total Capacity Four Neighboring Mills.	33	" "
Total Capacity Holyoke Area Mills .	.414	" "

Table B

Capacity of Trust 1912

Total Capacity Holyoke Divisions . . .	.243	Tons Daily
Total Capacity Non-Holyoke Divisions .	86	" "
Total Capacity of Trust	.329	" "

Table C

Writing Paper Production United States 1910

United States Total	.673	Tons Daily
Massachusetts Total	.332	" "
Trust Total in Holyoke Area	.243	" "

Table C illustrates the diminishing percentage of writing paper production made by the "trust." No longer did it enjoy control of seventy-five per cent of the writing paper production of the United States. Since it was formed in 1899 the paper industry had grown continually. The American Writing Paper Company was not growing along with the industry.

The "trust" was affected mostly by the ups and downs of business after the War. After the boom of 1916 had saved the

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1. Tables A, B and C are derived from tables given in Western New England 1(1):7 and 8.

Table III

List of Divisions of
The American Writing Paper Company
in 1910
with Rated Capacities

	In Holyoke	Pounds Per Day
1.	Albion Paper Company	40,000
2.	Beebe and Holbrook Paper Company	30,000
3.	Crocker Manufacturing Company	50,000
4.	George R. Dickinson Paper Company	60,000
5.	George C. Gill Paper Company	40,000
6.	Holyoke Paper Company	20,000
7.	Linden Paper Company	30,000
8.	Mt. Tom Paper Company	20,000
9.	Nonotuck Paper Company (2 mills)	45,000
10.	Norman Paper Company	45,000
11.	Parsons Paper Company	32,000
12.	Wauregan Paper Company	56,000
13.	Riverside Paper Company (2 mills)	18,000
	Total	486,000
	Non-Holyoke Division	
1.	Agawam Paper Company, Mitteneague, Mass.	20,000
2.	Chester Paper Company, Huntington, Mass.	6,000
3.	G. K. Baird Paper Company, Lee, Mass.	4,500
4.	Hurlburt Paper Company, South Lee, Mass.	10,000
5.	Windsor Paper Company, Windsor Locks, Conn.	68,000
6.	Oakland Paper Company, Manchester, Conn.	7,000
7.	Platner and Porter Paper Co., Unionville, Conn.	6,000
8.	Syms and Dudley Paper Co., Watervliet, Mich.	Idle (1910)
9.	Harding Paper Company, Franklin, Ohio	19,000
10.	Shattuck and Babcock Co., DePere, Wis.	32,000
	Total	172,500
		658,500

Source: Western New England (Springfield Board of Trade, Springfield, Mass.) 1(1):8

company from bankruptcy, its financial situation improved through 1917 and 1918. In 1916 the highest profit in its history was recorded, $2,524,378. In 1917 profits dropped to $150,287, but again in 1918 the large figure of $1,252,629 was realized as profit.[1] These figures are vastly different from the average profit for the ten-year period of 1906-1917 (not including 1916) which was $342,968.[2] As a result of the large profits during the war prosperity, reorganization was put off for what company officials hoped would be indefinitely. This was not to be, however.

When the Armistice was declared the paper industry was affected greatly. Orders immediately dropped, and a slump set in that lasted until the beginning of 1920.[3] This recession was the inevitable result of the end of World War I. Paper mills throughout the country had been running over capacity for several years, and most of this paper had been in demand and there was good turnover on wholesalers' and agents' shelves. By the end of 1918, however, paper stocks were high along with inventories of the wholesalers and jobbers. Soon after the Armistice, in anticipation of being caught with large supplies in a declining market, these buyers halted orders; and the result was a decided drop in paper production.

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1. Moody's Industrials, Vols. 1917-1919.
2. Holyoke Transcript, February 28, May 1, June 20, 1919.
3. See Table IV, p. 21.

Table IV

Paper and Board Capacity, Production and Per Cent of Production to Capacity[1]

Year	Capacity	Production	Per cent of Capacity
1899	2,782,219	2,167,593	77.9
1904	3,857,903	3,106,696	80.5
1909	5,293,397	4,121,495	77.9
1914	6,439,787	5,152,705	80.0
1917	7,000,000	5,803,808	82.9
1919	7,671,043	5,966,076	77.8
1920	8,540,000	7,185,122	84.1
1921	8,614,163	5,333,397	61.9
1922	8,970,000	6,874,834	76.6
1923	9,725,349	7,870,756	80.9
1924	10,500,000	7,929,985	75.5
1925	11,623,450	9,001,742	77.4
1926	12,000,000	9,794,086	81.6
1927	12,536,090	10,002,070	79.8
1928	12,933,200	10,403,338	80.4
1929	13,704,480	11,140,235	81.3
1930	13,643,100	10,169,140	74.5
1931	13,971,700	9,381,840	67.1
1932	13,728,040	7,997,872	58.3
1933	13,728,040	9,190,017	66.9
1934	13,888,310	9,186,598	66.1
1935	13,985,960	10,479,095	74.9
1936	14,458,090	11,975,552	82.8
1937	15,572,850	12,837,003	82.4
1938	16,191,300	11,380,814	70.3
1939	16,557,410	13,509,642	81.6
1940	16,890,970	14,483,709	85.7
1941	18,522,000	17,762,365	95.9
1942	18,772,000	17,083,862	91.0
1943	18,830,000	17,035,688	90.5
1944	19,260,000	17,182,804	89.2
1945	20,282,050	17,370,965	85.6
1946	20,420,000	19,277,667	94.4
1947	22,025,476	21,114,000	95.9
1948	23,240,000	21,921,757	94.3
1949	23,954,000	20,315,436	85.0
1950	24,481,000	24,377,222	99.5
1951	25,279,000	26,100,000	103.2

Sources: 1899-1941 - U.S. Census Bureau.
1941-1951 - American Paper and Pulp Association.

1. Capacity figures are based on 310 operating days per year.

These men miscalculated, however, because demand did not drop as rapidly or as deeply as they suspected. The result was that late in 1919 orders again began flooding the market, as the supplies of wholesalers dropped, and by early 1920 the paper industry was again booming. In 1920, however, a real recession set in and the paper industry was one of many industries adversely affected by it. In the paper industry the chief cause was overproduction. The improvements and increased capacity of the war years had finally made supply greater than demand, and the market was "glutted." Not until 1924 was the paper industry again able to call itself prosperous.

As a result of the recession in 1919 the "trust" lost about $500,000 in the first six months of that year. In 1920 the net profit rose to $1,687,673, which was the highest the company ever made except for 1916.[1] When the depression of 1921 came the "trust" found itself in a particularly helpless situation. It cut its operations to fifty per cent of normal and continued into 1922. The management tried to revive sales by instituting an advertising campaign. This failed to bring the desired increases. Next, prices were cut, but this failed also. Finally, both wages and salaries were decreased, but to no avail. In 1923 the company went into receivership with Mr. S. L. Willson, appointed receiver.[2]

It would come as a great shock to many people to read

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1. Moody's Industrials, Vols. 1920-1923.

2. History of American Writing.

that this large "trust" had been put into receivership, when as recently as the period 1916-1919 the company had reduced its bonded indebtedness by about eight million dollars. There was even some hope at this time that by 1920 a large enough number of bonds could be redeemed so that payments could begin on the preferred stock (on which dividends in arrears amounted to over 100 per cent).[1] To really comprehend the failure of the "trust," it is necessary to go back to 1914-1915 and realize at that time the "trust" was only saved by the exceptional year of 1916. The demand created by the war only served to delay the actual demise of the company. It was so close to financial downfall in 1915 that the two or three good years until 1923 made little difference. Most of the bankers, merchants, real estate men and city officials knew the "trust" was on its way to financial ruin. They knew it would come, but they did not know when. They did not have long to wait as bankruptcy papers were filed in 1923.

The failure of the American Writing Paper Company in 1923 was caused primarily and historically by poor management. The "trust" in the period 1899-1923 presents a classic example of a mismanaged company. The original organizers of the "trust" were financiers, and they overloaded the firm with capitalization. As history proves, the claims made in 1899 that the "trust" would be a great financial success were never fulfilled. The expected profits never materialized for the stockholders,

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1. Green, Holyoke, Massachusetts, pp. 234-235.

and the expected monopolistic control of fine paper production was never realized. Only six per cent was ever paid to the preferred stockholders from 1899 to 1923. In 1920 dividends of 140 per cent were in arrears on the preferred stock. No common stock dividends had ever been declared, and, as we have seen, by 1910 competition was prevalent in the writing paper part of the paper industry. Only in the war years 1916-1919 did the "trust" manage to reduce its bonded indebtedness.[1]

The management of the company failed to face the fact of overcapitalization, and the result was that many improvements and profits were wasted. The executives of the company always managed to receive large salaries and, except for the 1921 depression, these salaries continued at a high level through the ups and downs of the firm. There was also the factor of control which was very difficult in a financial sense, because of the diversified location of the various mills in the "trust." Varying factors, such as labor costs, transportation and markets, helped bring about inefficiencies within the "trust." Finally, a distinction existed within the management part of the company. There were the practical paper mill operators, who were used to running their mills in a certain way, and the men who made up the executive segment, who knew very little about the manufacture and sale of paper but a good deal about the method for overcapitalizing a business so as to realize high-salaried jobs and interest on their bonds. Many of the

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1. Moody's Industrials, Vols. 1915-1924.

decisions for managing the company were made by bondholders and stockholders who were far from the mills and unfamiliar with actual working conditions and problems there. The absentee-management of such an inherently loose organization was fatal.

Both John G. Callan, the engineer-economist who was the author of the Bondholders' Committee Report in 1915, and Sidney Willson, the man appointed receiver in 1923, laid the blame for the troubles of the "trust" at the feet of the management. As Mr. Willson described it: "A laxity developed on the part of management, brought about by the false security of a monopolistic business."[1] As we have seen, the American Writing Paper Company did not remain very long in a strong monopolistic position. When it was formed, it controlled about seventy-five per cent of the fine paper business of the United States and about eighty per cent of the fine paper business in the Eastern part of the country. By 1905, the independent companies in the Holyoke Area were successfully competing with the "trust," and by 1910 its market share was reduced to about forty per cent.[2]

After the bankruptcy in 1923, when Mr. Willson, the receiver, undertook the job of reorganizing the firm, he attacked that branch of the organization which had hurt the company the most, i.e., the management. Mr. Willson had a full understand-

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1. Industry 21(16):24-26.

2. Western New England 1(1):7-8.

ing of the needs of the stricken firm. For many years he had managed and supervised paper mills. His common-sense, practical policies were initiated early in 1927 when he began replacing the executive and management branch of the organization with new men. He hand-picked these new men because they were specialists in one phase or another of the paper business. By the end of 1928, an entire new management team had taken over and was operating the company.[1]

During his tenure as receiver, from 1923 to 1927, Mr. Willson constantly tried to install newer methods of operation to utilize as much of the machinery as possible. A much more active sales program, assisted by advertising and an entire new sales force, kept sales on a slightly rising scale. During the receivership period, the "trust" was able to pay its receivership obligations on time, and it did not have to resort to borrowing money. Its interest obligations, which were wholly incurred before 1923, kept the company in the red for a few years. By 1927, the books showed a net profit after interest payments of $173,216. This was the first year the "trust" had a profit since 1920.[2] Compared to the disastrous years from 1921 to 1923, the period 1924 to 1927 could be considered a successful one.

On January 27, 1927, the American Writing Paper Company was incorporated under the laws of the State of Delaware. The capitalization of the new company consisted of the following:

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1. Helen U. Kiely (interview).
2. Moody's Industrials, Vols. 1926-1928.

Funded Debt:

First Mortgage 6% Bonds (Due January 1, 1947)		$5,000,000.00
Serial 4% Notes		1,000,000.00
Capital Stock:		
Preferred Stock	90,000 shares	$9,000,000.00
Common Stock	200,000 shares	345,322.33

The new company had sixteen mills, fourteen of which were in Holyoke. The other mills were in Connecticut. Fixed assets were valued at $10,543,014.88 in the new company.[1]

At the same time, a subsidiary company was also incorporated in Delaware. This corporation was called Choral Properties, Inc. and was organized for the purpose of disposing of the mills, machinery and property of the old company, which were not included in the newly-formed company. There were twelve companies in all to be sold through this subsidiary. The sale of property through this subsidiary continued until all of the property designated was sold late in 1933.[2]

Although the period 1923-1929 was a prosperous one for many businesses, it was a trying time for the "trust." The biggest job of the "trust" was to regain its lost position in the fine paper industry. Much of its sales volume had been lost to the independent companies in Holyoke and in the eastern part of the United States. It was soon realized that the

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1. Table and assets taken from History of American Writing.

2. Ibid.

Table V

List of Companies Incorporated into the American Writing Paper Co. Inc. after Reorganization under the laws of the State of Delaware January 27, 1927

1. Albion Paper Co. Holyoke, Mass.	9. Mt. Tom Paper Co. Holyoke, Mass.
2. Beebe and Holbrook Paper Co. Holyoke, Mass.	10. Nonotuck Paper Co. Holyoke, Mass.
3. Crocker Manufacturing Co. Holyoke, Mass.	11. Norman Paper Co. Holyoke, Mass.
4. George R. Dickinson Paper Co., Holyoke, Mass.	12. Parsons Paper Co. Holyoke, Mass.
5. George C. Gill Paper Co. Holyoke, Mass.	13. Platner and Porter Mfg. Co. Unionville, Conn.
6. Holyoke Paper Co. Holyoke, Mass.	14. Riverside Paper Co. Holyoke, Mass.
7. Linden Paper Co. Holyoke, Mass.	15. Wauregan Paper Co. Holyoke, Mass.
8. Massasoit Paper Co. Holyoke, Mass.	16. Windsor Paper Co. Windsor Locks, Conn.

Source: History and Property of American Writing Paper Co. Inc. Holyoke, Massachusetts, compiled by American Writing Paper Company, 1933, p. 6.

geographical extent of the firm was so great that effective financial and production control could not be maintained. A program of concentration was deemed necessary if a return to profitable operations was desired. The sale of twelve of the mills belonging to the "trust" was the first step in gaining the necessary concentration. During this period (1923-1927) about $3,000,000 was spent on modernizing the remaining mills and installing new equipment. Mr. Willson, in 1927, listed a three-part program which he would follow as president of the new company:[1]

1. Selection of competent, experienced men to run the mills.
2. A thorough study of the human factor in business.
3. Financial policies designed to keep the company operating.

One of the first steps taken by the new president in line with the above program was the decision to reduce the Goodwill account from $18,000,000 down to $1.00 on the books of the company. This huge sum had been carried since the "trust" was formed in 1899. One result of these policies was the jump in net earnings in 1928 to $277,994.[2]

From 1927 to 1931 the new management continued making improvements in the "trust." During this period, approximately $2,500,000.00 was spent on repairs and improvements. Some of

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1. Industry 21(16):26.
2. Moody's Industrials, Vols. 1928-1929.

this money was spent on the consolidation of three plants in Holyoke. The Beebe and Holbrook division and the Massasoit and the Wauregan divisions were joined into a single manufacturing unit. These three divisions of the "trust," all in Holyoke, were combined to bring about production and freight handling economies. In 1930 all of the business of the company was concentrated in Holyoke when the two out-of-town divisions in Unionville and Windsor Locks, Connecticut were shut down. The loss of demand as the result of the depression brought about this action. Soon after this, the Parsons division of the "trust" in Holyoke was equipped to handle the type of high-grade paper production business transferred from the two shut-down plants. Other improvements included an entire new steam plant built at one mill and a new trestle and railroad siding built at another mill.[1] Savings on power, steam production, transportation and handling were gained by these measures. When the company reported a net income after interest and taxes of $364,433 in 1929, it came as no surprise to the observer who noticed the external improvements being made by the revitalized management.[2]

The policy of centralization as carried out by the management of the American Writing Paper Company in these years operated internally as well as externally. The internal changes were concerned with functional operation and control. For

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1. History of American Writing.

2. Moody's Industrials, Vol. 1930.

example, the sales department was made a single unit instead of having branches in the various mills and offices. The enlargement of the laboratory enabled the company to set up a department of technical control. In the accounting department and payroll department, the policy of centralization eliminated duplication and unnecessary waste of time and effort.[1] It was as a result of all these policies that, despite the beginning of the depression, the company made $145,338 in 1930.[2] This was the close of one of the most successful periods in the entire history of the "trust."

From 1927 through 1930 the company made money over and above its obligations. The amount earned per share on the preferred stock of the "trust" was:

1927	1928	1929	1930[3]
$1.66	$3.11	$4.08	$1.63

In the years just after World War I the problem of standardization became a very serious one for the "trust." After considerable study it was found that, because the firm did not have sufficient standardization, it was selling hundreds of papers which were only slight variations from other papers of the same type. For example, in 1920 the company listed 454 bond papers for sale. This was a condition which originated over a period of years between the salesman for the company and

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1. Helen U. Kiely (interview).
2. Moody's Industrials, Vol. 1931.
3. Ibid., Vols. 1922-1931.

the jobber who was offering specified "brand" papers. In order to get the lucrative business of these "brands" which always had a strong market, the salesman would offer to make the paper for a cent or two less than his competitor. In turn, the papermaking process would be cheapened in one way or another, and the jobber would be getting a paper which cost him less but which was also slightly, most times imperceptibly, cheaper in quality.[1] This process worked fine in the short run, but in the long run the effects of stopping and starting the paper machine for many small orders, which differed only slightly, began to tell, and expenses increased and profits dropped.

As the results of a study in 1920, the Chief of the United States Bureau of Standards in Washington was hired by the company to set up a system to utilize the instruments of testing and control. A system of code numbers was designed and used to classify the lines of paper which the company sold.[2] The hundreds of slightly different papers were eliminated, and a classification system of ten numbers was substituted. Over ninety per cent of the papers made before this time were discarded, and a streamlined list was substituted.[3] The importance

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1. George A. Galliver, "Savings We Have Made," reprinted from Factory Magazine, Vol. 27, No. 4 (October 1921).

2. Table VI, p. 33, illustrates the complete orderly breakdown which resulted from the new system of classification being installed by the management of the "trust."

3. Factory, Vol. 27, No. 4 (October 1921).
Helen U. Kiely (interview).

Table VI

A List of Classifications for Paper

Type	Class	Kind
0 Boards	0 Box	0 Untreated
	1 Card Middles	1 Treated
	2 Counter	2 Corrugated
	3 Leather	3 Build with Cor. & Uncor. sheets
	4 Manila	4 Pasted
	5 Patent Coated	5 Molded
	6 Press Spahn	6 Faced Single
	7 Trunk	7 Faced Double
	8 Illust. or Album	9 Special
	9 Water Proof Sign	
1 Book Printing	0 Bible	0 Uncoated
	1 Coating Stock	1 Clay or Equiv. Coated 1 side
	2 Book	2 Clay or Equiv. Coated 2 sides
	3 Mimeograph	
	4 Music	
	5 Offset	
	6 Text	
	7 Photogravure	9 Special
2 Bristols	0 Index	0 Machine
	1 Mill	1 Loft
	3 Rope	2 Air or Festoon
	4 Playing Cards	3 Barber
3 Building	0 Felts	0 Solid
	1 Deadening Felts	1 Pasted
	2 Gypsum & Plaster Bds	2 Coated
	3 Wood Pulp	3 Saturated
	4 Sheathing	
	5 Asbestos	
4 Covers	0 Box	0 Untreated
	1 Manuscript	1 Single
	2 Pamphlet	2 Pasted
	3 Photomounts	3 Duplex
	4 Black or Red Paper for Photo purposes	4 Coated 1 side
	5 Special Coating	5 Coated 2 sides
	6 Facing	6 Surface Colored
5 News	0 Newsprint	0 Untreated
	1 Hangings	1 Coated

Table VI (cont.)

A List of Classifications for Paper

Type	Class	Kind
6 Tissue	0 Carbon 1 Copying 2 Stereotype 3 Toilet 4 Toweling 5 Pattern 6 Wrapping 7 Cigarette 8 Textile	0 Single 1 Coated 2 Anti-Tarnish
7 Wrapping	0 Bogus Manila 1 Cartridge 2 Glassine 3 Kraft 4 Mill Wrapping 5 Paraffine 6 Rope 7 Vegetable Parchment 8 Wood Manila	0 Single 1 Duplex 2 Coated 3 Anti-Tarnish 4 Ctd or Impregnated with chemicals 5 Reenforced with cloth 6 Plied 7 Machine Glazed
8 Writing	0 Bond 1 Drawing 2 Envelope 3 Fines 4 Ledger 5 Manifold 6 Chart and Map 7 Papeterie & Weddings 8 Linen 9 Safety	0 Machine Dried 1 Loft Dried 2 Air or Festoon 3 Barber 4 Surface Treated 5 Loft dried for Parchment Deed 6 Chemically treated 9 Special
9 Industrial	0 For Chem. process 1 For Elec. process 2 Absorbent process 3 Sensitizing 4 Printing process (not printed) 5 Calender Rolls	0 Untreated 1 Chemically treated 2 Coated 3 Impregnated with special chemicals

Source: Prepared by the Department of Technical Control, American Writing Paper Company for use in classifying their products. January 1920.

of this system was very noticeable in the mills of the company. Since there were less divisions of paper, more paper was made under the new classifications. This resulted in large economies, because each paper machine could be assigned a class of paper, and its run of that paper would be continuous. With fewer shutdowns of the machines, costs declined and output increased. Fewer machines in the beating and finishing rooms were idle as the result of the installation of this system. In the selling department savings were also made, because of the simplified method of ordering.

About this same time, a laboratory, which was described as the "greatest paper research laboratory," was installed by the "trust" in its office building. Almost an entire floor was devoted to research and testing. The tests performed ranged from testing the shipments of wood pulp and rag stock to inspecting the photographing the finished sheets of paper. Problems which had plagued the paper maker for decades were analyzed and solved. One most important problem was the percentages of rosin and alum to use for sizing paper for various purposes. The laboratory discovered that too much alum was being used throughout the operation and, as a result of this report, about $150,000 a year was saved. Equipment in the laboratory was of the latest design and included chemical apparatus as well as the small-scale model of the paper machine on which sample runs are tested before being sent to the mills for actual production.[1]

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1. A Journey Through the World's Largest Paper Making Institution, American Writing Paper Company, Holyoke, Mass.

When the American Writing Paper Company first proposed simplifying its output, the laboratory was the place where the types of paper best suited to meet the demands of the market were discovered. By numerous tests ranging from strength and durability to opacity and porosity, the techniciens were able to recommend the number of classes of paper the company should produce and how many different kinds of paper under each class would meet the demands of the various fine paper consumers. Through the years the laboratory rendered valuable services to the company, to other paper manufacturers with problems and to the customers of the "trust" who were helped by both the laboratory technicians and the company salesmen to select the proper paper for the job they had in mind.[1]

By 1930, fully equipped laboratories with a qualified chemist in charge were standard equipment in paper mills throughout the country. With the help of these men and their machines for testing and standardizing the production of paper, many paper companies introduced their own trade-mark paper. These "mill brands," as they were called, were sold to jobbers on a nation-wide scale. Each fine paper mill met standardized qualifications in making the paper, but distinguished its product from those of other mills, making similar paper, by a trade name. Usually this name or mark was used to watermark the paper so the buyer would know at a glance what paper he was getting.

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1. Helen U. Kiely (interview); Walter Scott (interview).

Throughout the Twenties, the use of private watermarked papers for individual customers came to be displaced by the use of the "mill brands." S. D. Warren Paper Company and the Hammermill Paper Company were pioneers in the fine paper field with this type of development. The use of advertising helped companies, such as these, to sell their own brands of paper on a much larger market. "Old Hampshire Bond," a product of the Hampshire Paper Company of South Hadley, was a nationally-known "mill brand" before the turn of the century.[1] The "Certificate" bond of the Crocker McElwain Company, the Eagle A "Contract" bond of the American Writing Paper Company and the "Parsons" bond of the Parsons Paper Company are also examples of mill brands in current use.

It is through the use of "mill brands" that several of the local paper companies are able to compete on a nation-wide basis with paper mills in the Mid-west. By producing a paper of uniform quality, at a price that is reasonably competitive, the Holyoke companies have built up a demand for these brands across the nation. Personal selling and long experience with the buyers help to establish the brand in a strongly competitive position. The satisfactory experience of a consumer with one paper over a long period of time means he will continue to order this paper from the wholesaler, and this is decidedly to

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1. Reuben R. Thompson, ed., "The Progress of Paper," The Paper Trade Journal (The Lockwood Trade Journal Co. Inc., New York, 1947), 124(27):277-289.

the advantage of the particular paper manufacturer.[1]

The introduction of standardization, testing methods and controlling machines from World War I on, changed the paper and pulp industry into a very scientifically-minded industry. In contrast to the older methods of testing, such as feeling and smelling the "half stuff" or tearing and spitting on the finished sheet of paper, the chemist and engineer introduced the various machines that could be used to accurately measure, standardize and control the production of pulp and paper. This evolution in the industry may be referred to as the change of the processes "from an art to a science." The process of change began to be visible about 1910, and, in the next two decades, great progress had been made. Further progress was also made from 1930 on.

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1. Ralph Higgenbottom (interview).
   Walter Scott (interview).

CHAPTER III

Affects of the Depression and World War II on the "Trust"

In 1930 the American Writing Paper Company had reached a place in its long and faltering history where, if demand in the next few years had remained at a normal level, the company would have found itself by 1934 or 1935 in a very healthy financial position. The labors of Sidney Willson were just beginning to bear profits in the years prior to 1930. From the time he first took over the reins of the company as the receiver, he had tried to reorganize the company on a profitable basis. His efforts were rewarded when the company came out of the red in 1927. The owners and directors of the "trust" showed the faith and confidence they had in his ability by naming him president of the newly reorganized firm. Mr. Willson justified the confidence these men had in him when the increased earnings and new management policies of the company were reported for the following three years. In no way could the responsibility for what happened after 1930 be placed on the shoulders of the new management. The "Great Depression" had begun, and demand for paper and many other goods dropped rapidly. Good management had come too late to the "trust" to save it from the effects of a world-wide depression.

The output of the "trust" fell from 60,193 tons in 1929 to 36,688 tons in 1931 as the result of decreased demand. For the first time in five years the company failed to make a profit. The deficit amounted to $345,494. In 1932 output continued to fall to 24,812 tons, and the deficit for this

year increased to $646,444. On June 8, 1933 the stockholders voted to approve a change in the no-par common stock to a value of $1.00 per share. As a result, the capital of the company was reduced by $6,828,572. This amount was transferred to the capital surplus account. The fixed assets were also reduced from $11,882,469 to $7,421,913 as of December 31, 1932.[1]

These actions were taken to improve the financial strength of the firm. Output jumped to 30,937 tons in 1933, and the operating deficit was reduced to $235,984.[2] Deficits do not pay bills, however, and for the third time in its forty-four year history the stockholders voted to declare bankruptcy. Although the preferred stock had been paid a seventy-five cent dividend in 1929 and a $1.00 dividend in 1930, from this time until the bankruptcy in 1934 no dividends on preferred stock were paid. The company had never paid a dividend on its common stock.[3]

At this time the trust owned twelve mills, of which only seven were operating. In 1927 it owned sixteen mills, two of which were in Connecticut. These mills were sold in 1928 and all operations were concentrated in Holyoke. In 1928 two mills were sold to a converting concern which was just beginning operations in the city. The total number of mills owned

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1. Moody's Industrials, Vols. 1930-1933.

2. Ibid., Vol. 1934.

3. Ibid., Vols. 1930-1931.

by the company was reduced to twelve by 1929.[1] In 1936 the trust sold its Holyoke and Dickinson mills to the municipally-owned Holyoke Gas and Electric Department for about $55,000 cash. The machinery was removed and placed in the other mills to be used for parts and replacements.[2] Early in 1937 the Norman mill, which had been idle since May of 1927, was sold by the "trust" to Frank Gross of Boston for $3500. He proceeded to sell the machinery and equipment in the mill, and in May of 1937 he sold the property to the Holyoke Water Power Company.[3] By the summer of 1937 the trust, which had been organized in 1899 with seventeen mills in Holyoke and fourteen outside of Holyoke, was reduced to nine mills. Its employees in 1899 had numbered over 2,800. In 1937 it employed only about 1,100 persons.[4]

When the company went into bankruptcy the Court decided to allow the same officers to continue to operate it. Output was 30,840 tons in 1934, and the deficit was $504,210. In 1935 the deficit was decreased to $354,955 with a slight increase in output to 31,699 tons.[5] In this same year a reorganization plan was filed by the company with the court. The plan provided for the formation of a new company. The idle

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1. History of American Writing.
2. Holyoke Transcript, June 19, 1936.
3. Ibid., May 15, 1937.
4. Moody's Industrials, Vol. 1938.
5. Ibid., Vols. 1935-1936.

properties of the old company were to be disposed of, and additional working capital was to be acquired. A substantial reduction in fixed charges was also provided for. The plan was a sound one, and was put forth by a man who was to play a large part in the future history of the American Writing Paper Company.

Mr. Thomas H. Blodgett was the head of a finance company which took over defunct companies and rehabilitated them. This was exactly what he intended to do for the "trust." He would invest about $120,000 in cash at the outset if the reorganization plan was approved, and would provide for investment of $400,000 for improvements to the company in the four years from 1935 to 1939. While the plan was awaiting approval, Mr. Willson remained as president of the company. The sale of mills began in 1936 and continued for about a year and a half.[1]

The depression was still affecting the financial status of the company. By December 31, 1936 the total accumulated operating deficit for the period 1931-1936 amounted to $1,595,865. At the same time the Holyoke Water Power Co. had claims against the "trust" for $220,266.[2] In 1936 a loss of $32,312 was also recorded as a flood loss which resulted from the worst flood in the history of the city. A wall of water over fourteen feet high was pouring over the Holyoke dam. Most of the paper mills

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1. Helen U. Kiely (interview).
   Moody's Industrials, Vols. 1934-1938.

2. Ibid., Vols. 1932-1937.

were shut down and many were flooded. Extensive repairs were necessary when the flood waters subsided.[1]

On January 28, 1937 the plan for reorganization was approved, and the new owners of the company, Mr. Blodgett and his associates, assumed their duties. Mr. Blodgett became chairman of the board, and Mr. Leon M. Yeorg became president of the company. The new company officially began business on April 1, 1937, and was called the American Writing Paper Corporation. The various steps of the reorganization plan as given above were carried out.[2] The fixed assets of the company were reduced by the sale of three of the idle mills. By December 31, 1937 the capital stock had been reduced to $2,080,139, and the outstanding bonds were down to $2,821,650. The company only owned nine mills by this time. The fixed assets were down to $6,579,680, and, because of the depression, several mills were inactive. These mills in 1937 were valued at $1,650,636. The company continued to lose money in the last nine months of 1937, although the size of the deficit was reduced to $81,906.[3]

The new management tried desperately to get the company operating in the black. The year 1938 brought no relief from the depressed condition of the industry. This was a recession year for the rest of the companies, and Mr. Blodgett and

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1. Holyoke Transcript, March 25, 1936.
2. History of American Writing.
3. Moody's Industrials, Vol. 1938.

company did a fine job in coming out of the year with a deficit of $92,602, only a slight increase over 1937. About half of this sum was for interest charges on bonds, and one of the necessary jobs the management would have to do if it wished to continue was to reduce the amount of these bonds. A sign of recovery for the company was its sales reports from 1937 through 1940:

	Net Sales[1]
1937 (9 mos.)	$4,810,009
1938	5,806,663
1939	6,784,107
1940	6,531,748

One or two of the mills were still inactive in 1938 and 1939.

The twin policies of reducing the number of bonds and increasing sales paid off in 1939 when, for the first time since 1930, the company was able to report a profit of $238,750. In this year a profit of $202,036 was made by re-acquiring its own bonds, and in 1940 $37,745 was recorded in this account. The net profit dropped to $26,214 in 1940.[2] From this year on, the company, like the other paper companies in Holyoke, had little trouble making money. During 1938 and 1939 exports of paper increased due to the increased trade with Europe.[3]

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1. Moody's Industrials, Vols. 1938-1941.

2. Ibid., Vols. 1931-1941.

3. See Table VII, p. 45.

Table VII

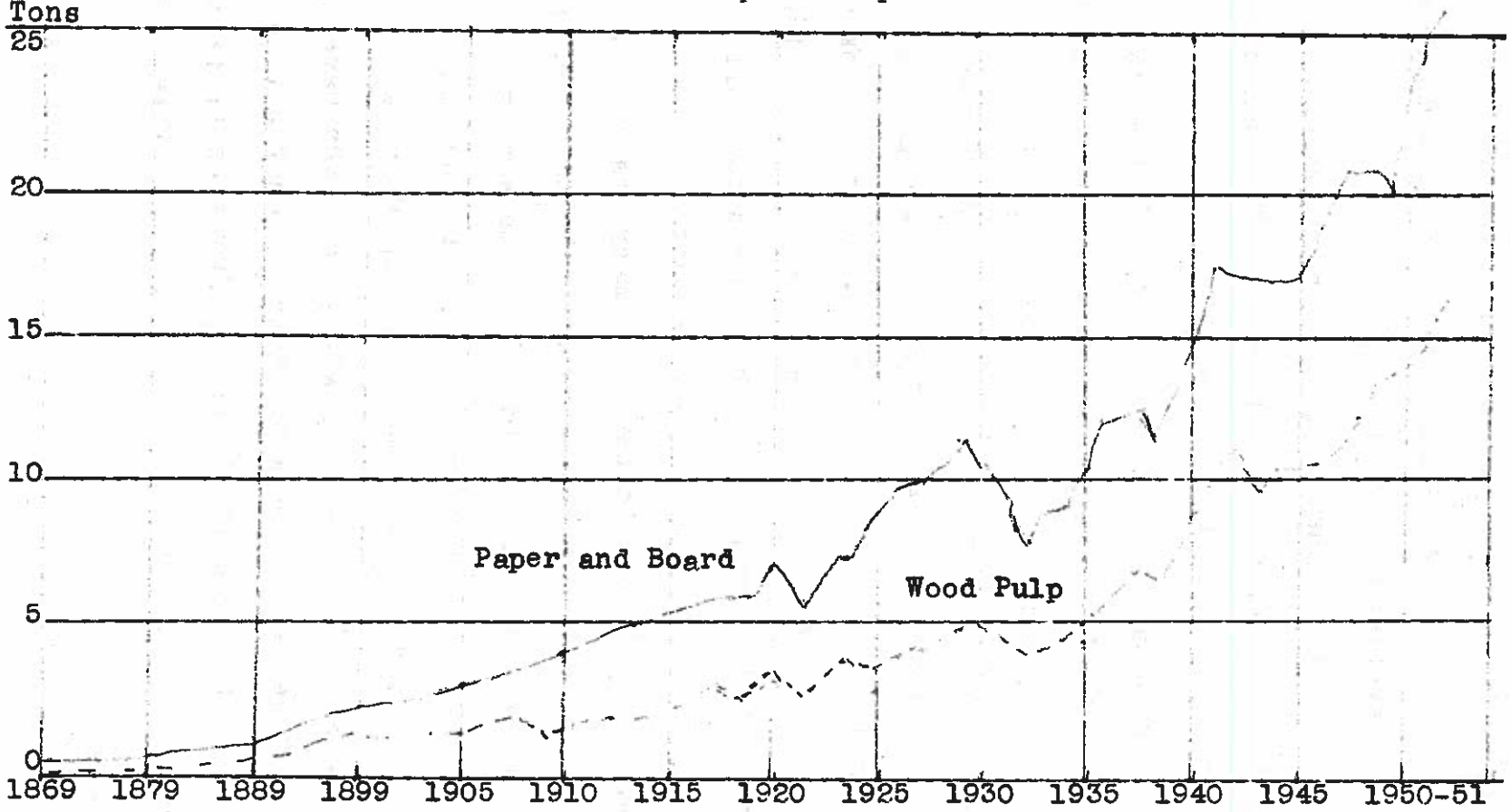
Paper and Board Imports and Exports 1900 - 1948 (even years)
(in Tons of 2000 Lbs.)

	IMPORTS		EXPORTS	
Year	Quantity	Value	Quantity	Value
1900	7,605	2,392,114	58,299	6,215,833
1902	8,343	3,170,159	62,681	7,312,030
1904	10,178	3,867,595	57,025	7,543,728
1906	12,613	4,792,840	82,605	9,536,065
1908	19,242	7,311,956	47,946	8,173,251
1910	64,309	8,252,680	59,812	8,994,277
1912	80,197	8,182,664	79,191	10,617,367
1914	316,219	17,689,146	83,155	11,023,774
1916	507,330	21,129,248	170,166	18,317,955
1918	627,127	39,594,922	255,103	42,676,610
1920	787,421	76,146,257	285,475	64,268,357
1922	1,109,184	81,280,314	128,088	22,616,947
1924	1,476,305	117,672,760	125,303	23,065,037
1926	1,944,499	139,499,174	158,896	26,829,736
1928	2,236,377	156,406,552	188,775	30,932,931
1930	2,346,567	147,460,754	206,428	28,967,615
1932	1,832,660	94,134,622	112,951	13,855,188
1934	2,254,809	86,378,631	158,056	17,294,074
1936	2,841,749	110,112,725	173,566	21,541,331
1938	2,340,860	112,970,962	195,935	23,925,411
1940	2,815,555	132,610,720	551,284	62,147,593
1942	3,037,896	138,795,642	341,920	59,401,179
1944	2,576,279	141,654,979	313,917	71,740,328
1946	3,625,982	253,631,744	393,250	105,816,475
1948	4,581,811	437,709,098	366,643	116,437,900

Source: U. S. Department of Commerce, Division of Foreign Commerce and Navigation.

Table VIII

Total Production Wood Pulp and Paper and Board



Source: The Statistics of Paper, 2nd ed., American Paper and Pulp Association, New York, 1949, p. 47.

Production of paper and board had a steady increase from 1939 through 1941 when controls and shortages of raw materials resulted in a leveling off of production.[1] While the company still had idle mills, they would soon be humming night and day under the impetus of the war demand. The policies of the Willson management, which resulted in the consolidation of the company geographically, were carried even further by the new management. An efficient consolidation, both geographically and financially, was being put into effect. Internally a diversification of paper lines to conform to demand was put into effect. Whereas before 1937 the sales department had made the production decisions, when Mr. Blodgett took over he changed this. The cost department became the decision-making body of the company. Production was controlled and directed by the reports of this department.[2] This, it may be argued, is how it should have been many years before.

During the years of the depression the American Writing Paper Company always had idle mills. Since each mill site had mill power rights which were granted by indentures signed by the company and the water supplier, the Holyoke Water Power Co., the payments for this water continued. The paper company, as a result, was paying for water which was not being used because of the idleness of the mills. Desiring to reduce or eliminate this cost, the paper company had two alternatives--

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1. See Table VIII, p. 46.

2. Helen U. Kiely (interview).

it could get the mill operating again, or it could try and find some other way of utilizing the water rights of the mill. The former was out of the question, as the depression deepened and more of the "trust's" mills became idle. The latter was possible only if the mill powers granted for the idle mills could be transferred to the active mills. Only the Water Power Co. could consent to this change. It refused to do so. The paper company decided to find other means of getting around the indentures.

One of the first weak points the "trust's" lawyers found in the indentures was their age. They had originally been set up in the 1870's and '80's when silver was much scarcer and more valuable than it was in 1931. The indentures allowed payment of the costs of the mill powers to be made in either silver bullion or currency. The paper company decided to pay in silver bullion because it could save about one-fifth of its charge, since silver was so cheap. The Holyoke Water Power Co., of course, took the case to court, because it refused to accept the lower value bullion. This case was the first of seven that were eventually to be brought by the Water Power Company against the paper company. They are so complex that it takes a lawyer to interpret them. The cases were tried in every federal and state court in our judicial hierarchy. The most famous of all the cases was the so-called "Gold Clause" case, and after four years of litigation in many courts was finally decided in favor of the paper company by the U. S. Supreme Court. It is interesting to point out that the paper

company won all of the suits except one.[1] Several of the important results of these cases to the paper mills in Holyoke ensued. In one case it was decided by the courts that a mill owner could use the power generated by the water wheels in his mill as he saw fit.[2] The significance of this decision was that it allowed the paper mills (or other mills) in the city to generate electricity within the mill. Another decision in one of the cases allowed the mill owners to transfer electricity from one mill site to another. In this manner electricity could be generated in a paper mill for use outside that mill in other paper mills which could not so generate their own electrical power.[3]

The independent paper companies were also litigants in suits which involved the use of process water and the taxing of indentures. The Whiting Paper Co. was the defendant in the process water case in 1931, and the Chemical Paper Co. was the participant in the tax case which was brought by the City of Holyoke. In both of these cases the paper companies lost. Between 1930 and 1939 a total of nine cases were decided which involved the complicated indentures by which the mills of the city, especially the paper mills, received their water for power and processes. Both the depression and the inflexibility of these indentures were the underlying economic causes of this

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1. Attorney Russell A. Davenport (interview).

2. Holyoke Transcript, January 9, 1936.

3. Ibid., June 4, 1937.

rash of litigation.

The closing years of the 1930's found the new management of the "trust" preparing for the upsurge in demand which would accompany the war effort. The financial policies of the company from 1939 through 1947 were designed to reduce and eliminate the $3,040,000 General Mortgage Bond Issue which had been placed on the "trust" in the reorganization of 1937. By applying every effort over this period the entire issue was reacquired by the company by the end of 1947. This burden relieved the company of such heavy financial responsibilities that it was able to pay its first dividend on common stock in 1947. This was a twenty-five cent dividend on 357,224 shares of $5.00 par common stock.[1]

In order to accomplish this job, sales and profits of the company had to increase greatly over the entries made under these accounts during the 1930-37 period. Net sales increased from $8.713,133 in 1941 to $13,325,982 in 1947. The heavy taxes and increased costs kept the net profits on a descending grade from a high of $353,494 in 1941 to a low of $150,611 in 1945. By 1947, however, the net profit had climbed to $574,490, which was the highest it had ever been in over twenty years.[2] This increased profit enabled the company to reacquire the last of its outstanding bonded indebtedness and still manage to pay a dividend of twenty-five cents on its common stock in 1947.

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1. Moody's Industrials, Vols. 1938, 1940, 1948.
2. Ibid., Vols. 1942-1948.

Mr. Blodgett and his associates made full use of the increase in demand which brought about the opportunities for fully utilizing the output of the mills still remaining in the "trust." The $400,000 which was spent on improvements by the "trust" from 1938 until 1941 was concentrated on the mills which could be most easily modernized. The money was not to be wasted on trying to bring up-to-date several of the very old mills still remaining in the "trust." That this policy paid off is indicated by the increase in production from 38,960 tons in 1938 to 48,500 tons in 1941.[1] By concentrating capital investments in the mills which would give the greatest increase in efficiency and production the company was able to increase its output, sales and profits.

At the same time it was selling its inactive mills. In 1943 the "trust" owned nine mills, two of which were inactive. Late in 1944 the Holyoke Water Power Co. purchased one of the inactive mill sites.[2] Continuing the policy of consolidation and concentration the company shut down another mill in 1948. This was the oldest mill in the "trust," and it was probably the most inefficient.[3] This left the company with eight mills, two of which were still inactive. These two mills were sold late in 1949, also to the Holyoke Water Power Co.[4] This action

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1. Moody's Industrials, Vols. 1939-1942.
2. Holyoke Transcript, December 10, 18, 1944.
3. Ibid., May 8, 1948.
4. Ibid., December 29, 1949.

reduced the "trust" to six mills, all of which were operating. Only one of these mills was not located on land adjoining the other mills. This was the result of the plan of the company to bring the remaining mills of the "trust" into a closely integrated operating unit. Closer control and greater operating economies among the remaining mills was the ultimate objective.

The number of mills in the "trust" was again reduced early in 1950 when the oldest mill still remaining in the company was shut down and sold. This latest action of the company came in the summer of 1952 when the main office building was sold, and the offices of the company were moved to a site adjacent to the mills. The result of these latest sales is that the American Writing Paper Corp. is today a highly coordinated five-mill company capable of producing many types of fine papers and various boards. Today the "trust" is more nearly like the independent mills of the city in terms of plant layout and managerial control than at any other time in its history.

Since 1947 the company has paid two dividends on its common stock. The years 1948 and 1949 were poor years, because the company had a deficit in 1948 of almost $50,000 and just managed to make $12,557 in 1949.[1] A ten per cent wage increase and a drop in paper prices, along with the slight recession in 1949, helped bring out these circumstances.

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1. Moody's Industrials, Vols. 1949-1950.

The recovery of company earnings in 1950 and 1951 warranted dividends of fifty cents and seventy-five cents in the respective years.[1] During this period capital expenditures for improvements continued, and the production of several mills was increased. One mill increased its capacity from thirty-seven tons daily in 1947 to forty-six tons daily in 1951. The board-producing mill of the company had a capacity of sixty tons daily in 1947, and in 1951 it could produce seventy-five tons of board daily.[2]

Along with the plan for reacquiring the outstanding bonds of the company the management has been slowly but continuously reducing the number of outstanding shares of common stock. In the reorganization agreement of 1933 the preferred stock was traded for common, thus leaving the company with only common stock on its books. From 1939 to 1951 the number of outstanding shares dropped from 416,068 to 282,400. This common stock was changed from no-par to $5.00 par in 1941 and was exchanged share for share by the stockholders.[3] Since this time, the stock has been quoted on the New York Curb Exchange as high as 12-5/8. The price has been consistently quoted above 8. This is an indication of the new confidence being displayed in the rejuvenated company.

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1. Moody's Industrials, Vols. 1951-1952.
2. Post's Paper Mill Directory, 1951 ed. (L. D. Post, Inc., New York City), pp. 223-225.
3. Moody's Industrials, Vols. 1940, 1942, 1952.

Most likely in the years ahead the American Writing Paper Corp. will continue to produce the encouraging results of the policies I have mentioned above. The foresighted policies of the present management have all but eliminated the internal difficulties which beset the company for so many years. The management will be better able to concentrate on the problems of holding and increasing its share of the paper markets. Less inefficiency is likely to creep in with the smaller number of mills now in the organization. The continued reduction of the outstanding shares of common stock means larger dividends in the future for fewer stockholders if earnings continue at a normal level. With the calibre of management that it now has, the American Writing Paper Corp. will be able to compete successfully in the future, not only with the comparable companies in Holyoke, but also with the paper industry elsewhere.

CHAPTER IV

Changes in the Independent Paper Companies 1899 - 1939

When the American Writing Paper Company was formed in 1899 it included sixteen paper companies which, up to that time, had been independent concerns. After the "trust" was incorporated there remained only six independent paper companies in Holyoke and two in South Hadley Falls. The largest of these independent companies was the Chemical Paper Company, which could produce fifty tons of assorted pulp papers every twenty-four hours.[1] This mill, along with the Newton Paper Company, was owned by the Newton Family of Holyoke. This latter mill was essentially a board-producing mill. Another large company was the Whiting Paper Company, which had a rated capacity of seventeen tons of paper daily.[2] Most of the independent paper companies were small mills (by present day standards) with one, two or three paper machines. In contrast to the American Writing Paper Company with its fifteen mills in Holyoke, its huge corporate setup, and its out-of-town management, the independent mills were small, long-established companies owned by families whose roots extended far into Holyoke's papermaking past. The Whiting and Parsons Paper Companies were excellent examples of this situation. William Whiting, Sr., set up his first paper mill in Holyoke in 1865, and the company was an immediate and continuing success.[3]

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1. Western New England 3(7):310-312.
2. Ibid., 1(1):7 and 8.
3. Everts, History of the Connecticut Valley in Massachusetts, Vol. II, pp. 918-919.

William Whiting II took over the management of the company when his father stepped down and continued the capable policies. Both father and son were very active in civic and political affairs, besides conducting the operations of their paper interests. William Whiting II had three sons who are today managing the various mills. Principal ownership of the oldest paper company in the area, the Parsons Paper Company, is held by the Bagg Family. Colonel Aaron Bagg was one of the officers of the first paper mill established in Holyoke back in 1853.[1] The ownership interests continued within the Bagg Family for many years. It was this company that sold one of its mills in 1899 to the "trust." This was the first mill sold by any of the independents to the "trust." Since that time the Parsons Paper Company has operated the remaining mill most successfully.

Other independent paper companies in Holyoke had family connections. The Valley Paper Company, a small mill, was owned principally by the Fowler Family. Many of the older Holyoke mills were connected to the famous Newton Family through one or more of its famous brothers. The Chemical Paper Company was wholly owned by the Newtons in 1910, along with the "Mud Mill," as the Newton Paper Company was called. As before 1900 there were very few owners or investors in the independent companies of the Holyoke paper industry from outside of the city. One of the few was Mr. O. H. Greenleaf,

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1. Everts, History of the Connecticut Valley in Massachusetts, Vol. II, p. 920.

Table IX

List of Independent Paper Manufacturers

in Holyoke, Massachusetts in 1910

with Rated Capacities

	Name	Pounds per 24 Hours
1.	Advertisers Paper Mill	8,000
2.	Chemical Paper Company	100,000
3.	Crocker-McElwain Company	40,000
4.	Franklin Paper Company	16,000
5.	Newton Paper Company	40,000
6.	Parsons Paper Company	15,000
7.	Taylor-Logan Paper Company	10,000
8.	Valley Paper Company	12,000
9.	Whiting Paper Company	34,000
	Total	275,000

Source: Western New England (Springfield Board of Trade, Springfield, Mass.) I(1):7.

who was one of the owners of the Holyoke Paper Company until the time it was sold to the "trust." Mr. Greenleaf was a philanthropist from the neighboring city of Springfield.

Across the Connecticut River in South Hadley Falls, the Carew Manufacturing Company was flourishing as it had since 1849 when it was founded by patriarchial Joseph Carew. This was the first paper mill established in the Holyoke Area. This was a two-machine mill with a capacity of about nine tons per day.[1] In 1910 new owners were in command, but the same high standard paper was being manufactured. Also in South Hadley Falls was located the Hampshire Paper Company, in which the Judd Family, long-time residents of Holyoke, were investors. Producing eight tons of paper daily, the Hampshire Paper Company was famous long before the turn of the century for its Old Hampshire Bond, a very high grade writing paper, which was famed both in this country and abroad.[2] In a neighboring town, North Wilbraham, the Collins Paper Company was an established plant in 1872. Some time later the company was bought by the Whiting Paper Company in one of its expansions. The Collins mills continued in operation for many years.

In 1910 there were twenty-one paper manufacturers in Holyoke with a total invested capital of $12,946,923. These mills turned out a total product valued at $12,589,948. The

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1. Everts, History of the Connecticut Valley in Massachusetts, Vol. II, p. 920.

2. Local and Business Directory for 1869 (Charles H. Lyman, Holyoke, Mass., 1869), (Manufacturing Section).

industry employed 4,367 persons, and the average yearly earning topped the $500 for the first time in the twentieth century in this year.[1] At this time wages in Holyoke were higher than many other sections of the industry. Many skilled paper makers gravitated to Holyoke for this reason, and because Holyoke was noted for the quality of the paper being made there. When machine tenders in Groton, Massachusetts were receiving twenty-one cents per hour, the same job in Holyoke was paying forty cents per hour.[2] There were many reasons for this: the vigor of the labor movement in Holyoke before 1904 pushed wage scales ahead of other regions; because of the nature of the paper made, more skill was required and, hence, labor commanded a higher remuneration; lastly, because of the quality of the paper they made, Holyoke manufacturers could command higher prices and could, thereby, afford to pay higher wages.

A significant difference between Holyoke and other sections of the paper industry was the three and two-tour work day. Before 1900 Holyoke paper workers had organized with this issue in mind. In 1898-1899 and again in 1902 the cry went up for a shortening of hours without loss of pay.[3] The Saturday evening to Monday morning shutdown was finally won

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1. Census of Manufactures (selected years), Holyoke, Mass. Paper Industry, Commonwealth of Massachusetts, Department of Labor and Industries. See Table II, pp. 13-14.

2. Letter from Martin J. O'Leary.

3. Green, Holyoke, Massachusetts, p. 208.

in 1902, and most of the companies accepted it. By 1912 most of the Holyoke paper companies were operating under the three-tour system. In many parts of the country during this period a 12-hour day was still the rule. This was the old two-tour system. In 1913 a bill was placed before the Massachusetts legislature to make a three-tour system statewide and compulsory. The bill was defeated mainly because by this time 80 odd mills of the 110 in the state had already adopted the three-tour system.[1] After 1910 the three-tour system was no longer a controversial issue in the Holyoke paper industry. As time went on, other issues arose to assume the spotlight.

One of the outstanding characteristics of the paper industry in general is the huge amount of capital needed to erect and operate a mill to manufacture paper. In the past history of the industry, this was not always true. Since the early 1900's and with the beginnings of integrated mills, along with mills to manufacture the end product continuously, the amount of capital needed to begin and maintain efficient operation has been huge. In such an industry where competition is very keen, volume production is absolutely necessary. In economics it is the simple principle of spreading the fixed cost over more articles for sale.

A second important characteristic is that the paper industry is dynamic. Each year brings important changes which open new markets to the far-sighted and ready paper manufac-

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1. Green, Holyoke, Massachusetts, p. 209.

turer, and close down other markets because of obsolete products. One of the best methods for protecting your mill from the consequences of such shifts is to periodically overhaul and modernize your plant equipment. This principle holds good for most phases of papermaking because most phases are highly competitive.

In 1903-1904 men in the Holyoke paper industry tried to apply these principles to their mills. The mills were members of the American Writing Paper Company, and the two men were Clifton Crocker and Frank McElwain. Both of these men were skilled and experienced paper makers, and in the next decade they were to prove to Holyoke that they had the necessary business sense to successfully operate a paper mill of their own. These two men resigned from their positions in the "trust" when they supported a recommendation to spend $1,825,000 on improvements to machinery and equipment, which was rejected by the executives of the "trust." This large sum of money would have modernized the equipment of the older mills then owned by the "trust" and enabled them to run their machines longer hours at faster speeds, which in turn would yield greater profits. Their argument was a good one, but it fell on deaf ears.

After leaving their positions in the American Writing Paper Company, Messrs. Crocker and McElwain decided to establish their own paper mill. In 1904 they managed to buy a mill with ten permanent mill powers from the Holyoke Water Power Company. This was a purchase by transfer because no new

permanent mill powers were available in Holyoke after 1881. Once the necessary water had been obtained, a new Fourdrinier paper machine was installed, and in 1905 the first paper was being produced at the Crocker McElwain Company, as it was named. At the outset the company, applying the principle of "run your machines faster than your competitors," failed to show a profit. In 1907 a second Fourdrinier machine was installed, and the output of the plant was doubled. As sales increased steadily, profits began to appear. From 1908 on, the Crocker McElwain Company has been one of Holyoke's most successful paper companies.[1]

The recession of 1907 did not affect the independent paper companies as seriously as it did the "trust." With the experience of past recessions, the independents in Holyoke wisely adjusted their production and inventory programs to keep their workers employed and their machines running. Several of the mills used the slack period to repair machinery and equipment. The Crocker McElwain Company installed their second Fourdrinier machine in this period. Of course, costs were lower during the recession, and the company saved money on the installation and initial purchase price.[2] This policy of utilizing recession and depression periods to improve plant and equipment was followed by the Crocker McElwain Company most rigidly throughout the fifty years of this study. The

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1. Green, Holyoke, Massachusetts, pp. 228-229. Walter Scott (interview).

2. Walter Scott (interview).

other independent companies also followed this plan with notable success. As a result, the fluctuations of the business cycle hurt the "trust," which never seemed to adjust to them adequately, much more than they did the independent companies.

Inefficiency and mismanagement in the local paper industry were not evident only in the American Writing Paper Company. In 1910 the Chemical Paper Company found itself in poor financial condition and was put up for sale. The two enterprising owners of the Crocker McElwain Company decided to purchase it and set it up under their own ideas just as they had done at the Crocker McElwain mill. Since 1908 this company had been showing a steady profit, and both men realized that it would be foolhardy to jeopardize what they had already gained by making one corporation or company of the two.[1] There was a very real risk involved because the Chemical Paper Company mill was old and needed repair. Its machinery was in need of modernization and improvement. However, it was a large mill, and in its day was one of the best in the area. Of even greater importance were the sixteen permanent mill powers attached to the property which insured plenty of water for both power and process operations. All permanent mill powers had long since been sold, and additional water could only be obtained by transfer through sale.[2] Both

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1. Walter Scott (interview).

2. Green, Holyoke, Massachusetts, p. 229.
Ralph Higgenbottom (interview).

men were willing to accept the risk in attempting to bring the plant back to its former profitable position.

Accordingly, capital of $2,000,000 was authorized, and the Chemical Paper Company was set up under its new owners, Clifton A. Crocker and R. F. McElwain. There was $500,000 of First Preferred and $500,000 of Second Preferred stock. About 1,200 shares of the First Preferred stock were offered to the public and sold. In addition, $1,000,000 of common stock completed the division of the authorized capital. Some of this stock went to satisfy the creditors of the former Chemical Paper Company.[1] Early in its career the company had been capable of producing fifty tons of paper daily. When the new owners took over in 1913 output had dropped to about thirty-two tons daily. By completely reorganizing the personnel and making some improvements in machinery, they succeeded in upping the production of paper by 1915 to forty-five tons daily.[2] In later years this was to prove to be one of the most modern and most profitable paper mills in Holyoke.

The years from 1916-1921 were boom years for the Holyoke paper industry as they were for all segments of business. The years previous to the United States' entrance into World War I were marked by high demands for many goods to be supplied to England and France. Exports of paper jumped from 83,155 tons in 1914 to 110,378 tons in 1915, and in 1919, after

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1. Western New England 3(7):312-313.

2. Green, Holyoke, Massachusetts, p. 229.

steady increases, reached 370,539 tons.[1] This figure was not surpassed until twenty years later when another war was imminent.

At the same time, demand for paper in the United States increased enormously throughout the war period. The Holyoke mills were greatly affected by this stimulus. Both the Crocker McElwain Company and the Chemical Paper Company were kept running with a backlog of orders. By following the policy of running the machines as fast as they could go while making a satisfactory sheet of paper and keeping this speed up for long periods of time, Messrs. Crocker and McElwain were able to make profits enough to pay up their mortgage on the Chemical Paper Company. This policy is very tough on machinery but, aside from minor replacements and small additions, the old machinery was made to do throughout the boom period. Both men had experience with the business cycle before at the Crocker McElwain mill, and they were going to apply their experience to their Chemical Paper mill. Expansion and purchase of new equipment did not take place until the downturn of 1921-1922. Then new machinery was installed, and the output of the plant was upped considerably to seventy-five tons daily.[2] Their policies were progressive and profitable, and the renaissance of the Chemical Paper Company proved that the same policies could be applied under varying circum-

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1. See Table VII, p. 45.

2. Walter Scott (interview).

stances and still succeed.

Other paper companies in the city were quick to sense the increase in demand and react to it. The Parsons Paper Company was rushed with orders and ran continuously year-round at rated capacity or even higher. So it was with the Valley, Newton, Franklin and Whiting Paper Companies also.[1] Since capacity was figured on a six-day week, by working on Sunday capacity production could be bettered. A paper mill would have had a hard time losing money during this period.

One very important problem in this period was labor. When the three-tour work day was inaugurated in Holyoke, the mills had no trouble finding the necessary skilled labor to keep the mill running for one or, if demand warranted, two shifts. Enough machine tenders, back tenders and skilled beater men could be found to keep two shifts running if necessary. When the war period arrived, however, not only did the Armed Forces take men away, but higher wages could be paid by defense plants; and many men deserted the paper industry to take other jobs. Running twenty-four hours a day meant having three complete machine crews and beater men and, since these were skilled jobs, there were few men able to fill the vacancies. There were several results of such shortages. First of all, a lower quality of paper was turned out in many cases. High-grade lines of paper were cheapened by running the machines too fast

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1. Elmer Cooley (interview).
   Thomas Murphy (interview).

or because of improper beating. Because wartime demands are not as exacting, much of the lower quality work was accepted by consumers.

Throughout these ups and downs of the business cycle, most of the Holyoke paper companies followed the pattern dictated by demand. When orders were few, production was cut drastically and unemployment increased. As orders again became plentiful, most of the mills increased output until the glut came in 1921. As before the war, however, the Crocker McElwain and Chemical Paper Companies fared better than the rest. By running the machines as fast as they would make paper, day and night, these companies made money. When the depression set in, they began rebuilding and remodeling the old worn-out machinery. At the same time, the capacity of both mills was increased (Chemical Paper Company from forty-five to seventy-five tons; the Crocker McElwain from forty to forty-five tons).[1] As a result of this expansion and replacement program, these mills were prepared for the upswing which occurred from 1924 to 1929 in the paper industry. By this time both mills had proved to be most profitable investments for their owners.

There is little to report on the other independent paper mills in the area during this period, except to state that all were hard hit by the recessions following the war. All re-

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1. Walter Scott (interview).

covered and by 1925 were again increasing production and employment to meet the increased demand.[1]

When the "trust" went bankrupt in 1923, each of the independent companies in the area gained some of its business. Added to this was the fact that the period 1924-1929 was a time of increasing demand for all types of paper.[2] Except for 1927, when demand for writing paper and other business paper faltered because of the Ford Motor Company shutdown and an ultra-conservative feeling in business in general, the paper industry as a whole was prosperous. In this period, total capitalization in the industry went over the billion-dollar mark for the first time. The value of products produced by the industry also surpassed the billion-dollar level in 1927.[3]

The upward swing of the business cycle during the 1924-1929 period and the introduction of pure sulphite papers into the fine paper field combined with local events to give Holyoke a new paper company. The new company was called Whiting and Company, Incorporated. The Whiting Family, headed at this time by William Whiting II, already was operating two mills known as the Whiting Paper Company. These were the prosperous, long-established mills that were founded in Holyoke in 1865 by the first William Whiting. Edward C. Whiting, the third gen-

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1. See Table II, pp. 13-14.

2. See Table X, p. 69.

3. The Statistics of Paper, 2nd ed., American Paper and Pulp Association, New York, 1949, p. 59.

Table X

Apparent[1] and Per Capita Consumption
of Paper and Board
(for selected years) 1899 - 1950

Year	Total Paper and Board (tons)	Per Capita (lbs.)	Board (tons)	Per Capita (lbs.)	Paper (tons)	Per Capita (lbs.)
1899	2,167,593	57.9	394,111	10.5	1,773,482	47.4
1904	3,028,992	73.3	559,711	13.6	2,469,281	59.7
1909	4,102,693	90.5	883,088	19.5	3,219,605	71.0
1914	5,395,270	110.2	1,291,805	26.4	4,103,465	83.8
1919	6,253,084	119.1	1,849,635	35.2	4,403,449	83.9
1921	6,027,141	111.4	1,718,568	31.8	4,308,573	79.1
1923	9,193,588	164.8	2,804,554	50.3	6,389,034	114.5
1925	10,416,512	181.4	3,298,029	57.4	7,118,483	124.0
1927	11,925,188	201.8	3,754,577	63.5	8,170,611	138.3
1929	13,411,455	220.3	4,303,506	70.7	9,107,949	149.5
1931	11,347,028	183.0	3,721,814	60.0	7,625,214	122.9
1932	9,726,596	155.8	3,208,841	51.4	6,517,755	104.4
1933	10,915,583	173.8	3,972,375	63.3	6,943,208	110.6
1935	12,757,723	200.5	4,582,861	72.0	8,174,862	128.5
1937	16,027,993	248.8	5,677,802	88.1	10,350,191	160.7
1938	13,542,356	208.6	4,967,529	76.5	8,574,827	132.1
1939	15,948,557	243.7	5,943,857	90.8	10,004,700	152.9
1940	16,757,305	254.5	6,141,741	93.3	10,615,564	161.2
1941	20,421,466	306.6	8,284,909	124.4	12,136,557	182.2
1942	19,780,439	293.8	7,873,355	116.9	11,907,084	176.8
1945	19,665,487	281.7	8,809,905	126.2	10,855,582	155.5
1946	22,509,788	318.8	9,423,363	133.4	13,086,425	185.4
1947	24,748,656	343.7	10,292,589	143.0	14,456,067	200.7
1948	26,105,467	356.4	10,677,904	145.8	15,427,563	210.6

Source: American Paper and Pulp Association, based on Bureau of the Census data.

1. "Apparent" Consumption is Production plus Imports less Exports.

eration of paper-making Whitings, was made president and treasurer of the new mill, while Fairfield Whiting became secretary of the new mill. William Whiting III was named president of the Whiting Paper Company on the death of his father. Thus, by 1935 the three brothers each had a stake in the family paper manufacturing business.[1]

The site of the new mill was the plant of the Lyman Mills, an old textile concern which was liquidated in 1927. Whiting and Company, Inc. was formed, and it bought the property. The textile machinery was sold, and the plant was extensively remodeled to accommodate paper-making machinery. Fourteen modern beaters were installed along with two 114-inch Fourdrinier paper machines. These machines were of the very latest design and were the fastest machines in Holyoke in 1928. The site of the mill included fifteen permanent mill powers between the first and second level canals. This fact alone made it an ideal site for a paper mill. The capacity of the mill was about thirty tons of paper every twenty-four hours. Today the output has been increased to about thirty-six tons daily.[2]

The new mill could turn out more paper daily with two Fourdrinier machines than the number-two mill of the Whiting Paper Company could produce with three Fourdrinier machines. There were two reasons for this: first, the machines were wider

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1. Thomas Murphy (interview).

2. Edward C. Whiting (interview).
   Thomas Murphy (interview).

and faster; and, second, the type of paper being made was different. The all-wood pulp (sulphite) bond and writing papers were achieving tremendous popularity, and this paper could be made at a more rapid speed on the machine than the rag content papers. The new mill was based on making this paper in volume for many special uses in the printing and converting trade. From the start, the new mill was a success and has remained so to the present time.

In general, the independent paper companies continued operating much more successfully than the "trust." The difficulty of obtaining enough orders to keep the mills running was one problem which pervaded the entire industry. As general business activity declined, the demand for business and industrial papers of all kinds suffered. The nation-wide production of paper dropped drastically.[1] In Holyoke most of the mills operated on only one shift and found it difficult to keep the mill running even then for a full week. Most of the independent companies lost money, but all managed to survive.

The older mills, such as the Parsons, Valley and Whiting Companies, were forced to dip into reserves that had been carefully built up over the years for such emergencies. The Chemical Paper Co. embarked on a $500,000 improvement plan which included a new filter system and the introduction of two new Cylinder machines. A new building was erected to house these machines, and, despite the depression, the company continued to

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1. Morris C. Dobrow, "Another Paper Production Record," reprint of address from Paper Trade Journal, February 22, 1952.

make money. The same was true of the Crocker McElwain Company. The output at the Chemical Paper Co. was increased from about seventy-five to ninety tons daily.[1] As business began to improve, the Chemical was ready. By 1936, despite the heavy outlays just five years previous and despite the depression, the Chemical Paper Co. was able to pay off the last of its indebtedness.[2] The Crocker McElwain Co. in 1934 and 1935 added several new lines of papers to its output. These were cheaper papers with which to compete for the growing demand in this field. One of the papers was named the Militant Bond, and it was a twenty-five per cent rag sheet. A short time later they introduced the Confederate line of air-dried sulphite papers. In 1937 the mill rebuilt one of its paper machines which increased its capacity.[3] The Parsons Paper Company also rebuilt one of its paper machines at this time.[4]

It is undoubtedly true that the process of shifting production to the more popular wood pulp papers helped the local paper industry to survive the depression. Most of the companies had, by 1930, begun making twenty-five, fifty and seventy-five per cent rag papers. The days of the one hundred per cent rag paper, for many uses, were over. Only for the very finest letterheads and for public and private documents that had to

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1. Walter Scott (interview).
2. Green, Holyoke, Massachusetts, p. 229, fn. 6.
3. Walter Scott (interview).
4. Henry V. Burgee (interview).

last indefinitely was one hundred per cent rag paper to be used from this time on. The depression forced the local paper manufacturers to realize this in order to survive.

The most severe effects of the depression on the local paper industry were over by 1935. The industry had already begun to increase production and re-hire help. Looking at Table II, pp. 13-14, we find that in 1928 the value of products made was $20,925,133. In 1932 product value had dropped to $8,223,470. This was the lowest point reached in the decade. From 1932 through 1937 the value of products made increased steadily about one or two million dollars a year. The short but violent recession of 1938 set the local industry back to the 1935 level of output. Again in 1939 the upward climb is evidenced, however.

Despite this general trend toward prosperity and increased demand at the end of the depression years, several of the local paper mills went out of business. Early in the decade 1940-50, the demand for paper in the Holyoke Area mills was slow in rising. Several independent mills in the area had survived the depression, but the upturn in the business cycle did not come quick enough to help them. The first of these was the Hampshire Paper Co., which in 1866 had bought out an older paper concern in South Hadley Falls, just across the Connecticut River from Holyoke. The mill was set up to turn out fine writing and high-grade ledger papers. Its original capitalization was $200,000. The company became famous when it advertised "Old Hampshire Bond" on a nation-wide basis. It was the first

paper company to sell a nationally-advertised paper.[1] It was a small, two-machine mill whose ownership stock was very closely held. By the close of the decade 1929-1939 the owners of the mill knew they would be forced to spend relatively large sums of money in order to continue making paper in the face of ever-increasing competition. The owners decided to sell the mill and the Stevens Paper Mills, Inc. bought it.[2] This company was a newcomer to the Holyoke Area paper industry. It owns several small mills which make coil, condenser and transformer paper mostly to supply General Electric Co.

Early in 1941 a paper company which had been operating successfully in Holyoke since 1904, the Taylor-Logan Paper Co., went out of business. This was the first paper manufacturing company founded in Holyoke after the "trust" was formed in 1899. It was a small, one-machine (Fourdrinier) mill turning out fine papers. By 1940 the company owed the Reconstruction Finance Corporation about $64,000. When the company went out of business in March 1941 it was $17,500 in debt to the City of Holyoke for unpaid taxes.[3] This was a paper company which did not have the cash reserves of the older, larger paper companies in the city, and, therefore, it needed financial help just to survive the '30's.

When the man who had been running the mill since 1918,

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1. Progress of Paper, p. 288.
2. Holyoke Transcript, March 15, 1940.
3. Ibid., March 25, 1941.

John F. Adie, died in February, 1941, the owners of the company decided to discontinue operations. The heirs of the two families for whom the company was named realized they could no longer hope to get a return on their investment in this small mill. On May 16, 1941 the mill was sold at auction to the Reconstruction Finance Corp. for $10,000.[1] This mill did not become a paper manufacturing mill again. Apparently, even with the high demand for paper, investors realized little paper and probably less profit could be made in a mill with only one 56-inch Fourdrinier paper machine.

During the years 1942-1947 the independent paper mills continued capacity production. As the very high demand for paper began returning to normal after the cessation of hostilities, several other paper companies and a pulp mill were subject to various changes. The first of these to be affected was the Carew Manufacturing Co. in South Hadley Falls. This was the oldest paper mill in the Holyoke Area. It was built in 1848 when Joseph Carew organized his paper company, and in 1948 when it sold out it was 100 years old.[2] The original line of family descendants still owned the company; and it was the death of one of these men, who had been active in the running of the mill in 1948, which contributed to the eventual sale of the company. It was sold to Texon Incorporated, a company which owned a similar mill in Russell, Massachusetts. The new

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1. Holyoke Transcript, May 16, 1941.

2. Ibid., August 19, 1948.

concern replaced much of the outmoded equipment with equipment for impregnating paper. The new management decided to specialize in new lines of leather substitutes.

The Carew Manufacturing Company was a two-machine (Fourdrinier) mill turning out about 24,000 pounds of paper daily. It specialized in fine writing papers, and in 1941 bought the rights to Old Hampshire Bond from the Hampshire Paper Co. For many years the Carew Manufacturing Co. made a specialty of producing special watermarked papers for individual buyers. The mill was the oldest in the region (founded in 1848) and the improvements over the years were few and far apart. While the mill did spend some money on improvements after the second World War, still much of its equipment was either outmoded or in need of repair. When it was sold, the company was just about operating a full week and conditions were not expected to improve. The company may have been able to continue for some years, but it would only have lost money during this time. While financial records of the company are not available, it is known that Texon, Inc. bought the mill at a reduced price.[1]

The Collins Manufacturing Co. in North Wilbraham also changed ownership in 1949. This company, prior to 1900, belonged to the Whiting Family. For many years it made fine writing papers very successfully. The mill was only a small one with two Fourdrinier machines and a maximum daily output of about twelve tons. In 1949 the new owners changed the name

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1. Herbert Webster (interview).

of the mill to New England Forest Products Co., Inc.[1] This was an attempt to continue producing the same types of paper in the same quantity under new management. It didn't work, however, and in 1950 the company was again sold; and this time the owners changed the name to the Wilbraham Paper Corp. The present management has changed the production of the mill to folding box board. A new de-inking plant has been set up, and some bleached cotton pulp is being made. This is a very clever idea, because the mill will never have a shortage of raw materials being in a region where huge amounts of paper are consumed. Much of this paper easily lends itself to the de-inking process, becoming ideal raw material for box board and other lightweight protective products. This was the last of the fine paper mills in the Holyoke Area to either go out of business entirely or change their output to a specialized product in the decade 1940-1950.

The four companies I have cited are similar in several important respects. They were all independent companies, either principally owned or controlled by a family or families. This coincides with another point, and that is, these mills were old. The family ownership in the Carew, Hampshire and Taylor-Logan companies extended in an almost unbroken line back to the founding of the concerns. One of the mills was over one hundred years old, and all except the Taylor-Logan Co. were founded before 1900. The influence of long-time family

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1. Post's Paper Mill Directory, 1951 ed., p. 228.

ownership was not good for these companies. The tendency in most companies with this type of ownership, in the local paper industry, has been a feeling of complacency and laxity on the part of the owners. As long as they received their returns on their investment they did not take a constructive or far-sighted interest in the affairs of the company. Important decisions and policy were left in the hands of the mill's superintendent or general manager. These men cared little about the future of the company or its relative position in the changing paper industry. They were primarily concerned with the size of their salary.

Besides being family influenced and old, these companies also were similar because they were relatively small mills and they produced about the same product. None of the mills had more than two paper machines, and the Taylor Logan Co. had only one. These machines were all under 100 inches in width, except one machine at the Collins Manufacturing Co. which was 102 inches wide. All of the machines were Fourdrinier models designed to make fine writing papers such as bond, ledger and index papers. The competition of the larger mills with their higher speed, greater-width machines was simply too much for these companies. If modern equipment and machinery had been installed regularly, several of these mills would be still operating today. As it was, they had only two alternatives. One was to go out of business, and the other was to change the type of product being made to one which could be made profitably with the existing equipment and plant. Several of the

companies took the latter alternative and, under new management, are successfully operating today.

The effect of the depression 1930-39 and the changes within the paper industry generally were important causes of the various changes in the paper mills of the Holyoke Area. These small mills were unable to keep operating profitably in the face of such a drastic decrease in demand. Even in a depression the larger, newer mills can sell their product cheaper than the smaller mill. The increased tempo of business beginning in 1939 helped several of the mills to continue until this temporary activity had died off considerably in the years 1947-49. The decreased use of rag content papers and the drop in demand for all high-grade, high-cost papers throughout the industry also helped to push the smaller, more marginal paper companies out of business, or at least into financial distress.[1]

That constant technological improvement is necessary and successful is illustrated by the Mount Tom Sulphite Pulp Co. This company, with its plant located a few miles up the Connecticut River from Holyoke, became a paper producer in 1947 and the only integrated paper mill in western Massachusetts. For over fifty years this mill had been producing sulphite pulp at the site of the famous OxBow in the Connecticut River. It was the first sulphite pulp plant in this country, having been started in 1881.[2] The mill was started at that particular

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1. Morris C. Dobrow, copy of address presented to the Association of Waste Material Dealers, 1939.

2. Arthur Showalter (interview).

site, because up until World War I the Connecticut Valley Lumber Co. used the same bend in the river for its saw mill. The location was ideal, not only because of the proximity to the supply of raw material and the plentiful supply of water, but also because Holyoke, the "Paper City of the World" at that time, was a mere five miles away.[1]

As it turned out, much of the production of the mill, which was about thirty tons of bleached sulphite pulp daily, was never sold to Holyoke paper mills because of an experiment with the pulp which failed. Nevertheless, the mill thrived, and by 1910 it had upped its production to fifty tons daily. When the Connecticut Valley Lumber Company went out of business in 1917, the log drives down the river ceased, and all of the pulp wood had to be trucked or freighted to the mill. During the 1920's a new type of pulp was developed that could be used for making glassine paper. Until about 1934 this was the most popular product of the mill.[2]

The depression forced other changes upon the mill. It began to limit its market radius to fifty miles of the mill. A few customers were retained beyond this radius, but for the most part mills within this area purchased most of the output. In order to pull the mill out of the depression slump a kind of pulp designed for making tissue papers was developed. This supplanted the glassine type pulp in the middle '30's and re-

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1. Arthur Showalter (interview).

2. Ibid.

mains to this day the principal product of the plant. The pressure of competition by the large pulp and lumber companies was ever present to this comparatively small mill. It specialized in supplying small paper manufacturers with wet sulphite pulp and, since its output was so small, it took only five or six medium-sized paper mills to use up all of its output.[1] It tried to supply a market which was just a bit too small for the large pulp manufacturers to reach. With very able management it was able to succeed in this respect for many years.

In 1947 the mill was bought by the San-Nap-Pak Co. This was a tissue manufacturing concern from New York. Upon taking over the mill this company decided to put in a paper machine. Thus, the mill became not only the only pulp mill in Massachusetts, but the only integrated paper mill in the western part of the state.[2] The mill was sold in 1949 to another tissue manufacturer, Doeskin Products, Inc. which has installed a second Fourdrinier paper machine and is turning out about eight tons of facial tissues, napkins and toilet tissue daily. The production of the pulp mill has been increased to about sixty-five tons daily. The mill today employs about 130 persons. Doeskin Products, Inc. is a New Jersey corporation, and the markets for its products are not local. New digestors, a new

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1. Arthur Showalter (interview).

2. Post's Paper Mill Directory and Lockwood's Directory (extended research in both volumes).

filter plant and a change-over from coal to oil for manufacturing steam were other important improvements introduced from time to time as the mill was changed to an integrated paper producing plant.[1] This company is a perfect example of a small pulp mill managing to continue to operate successfully by means of innovations and capable management, despite the overwhelming competition of the specialized and integrated pulp mills, in other parts of the country.

The independent paper companies in Holyoke realized the need for far-sighted, progressive management which would be ever watchful for innovations and improvements which could increase production or decrease costs during the depression. The Parsons Paper Company, owned by one of the older families of Holyoke paper making, hired an experienced papermaker from Wisconsin to run its mill. Mr. Henry Burgee came on in the early '30's and brought many ideas that were new to Holyoke paper manufacturers. Since his arrival, Parsons Paper Company has become one of the most up-to-date paper mills in western Massachusetts. The elimination of sheet-by-sheet handling which predominated in many operations of the company, the introduction of an air drier in 1932 and the building of the paper machines in 1935 were some of the improvements introduced to reduce costs. Since 1945 the company has spent over $1,000,000 on new equipment. A new building to house additional machine and storage space was completed in 1949 and a large,

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1. Arthur Showalter (interview).

newly-designed washer was put into service within the past few years.[1]

The other progressive independent mills in the city have followed similar policies in the period just prior to and since World War II. The companies most eager to invest in their mills seem to be the following: Whiting and Co. Inc.; Valley Paper Co.; Chemical Paper Co.; Crocker McElwain Co.; and Parsons Paper Co. Keeping alert to the latest improvements and innovations in the papermaking field, these companies have constantly tried to decrease costs or increase output. In several of the companies special obstructions to improvements are encountered. Several of the mills, for example, cannot increase the size of their machines because of the limitations they are subject to for property space along the canals. Another example of these unique obstacles are the canals themselves. Many of the companies have their paper machines set up at right angles to the canals and, therefore, they cannot set up the continuous production line type of operation which is otherwise possible. This latter example increases costs because paper must be handled several times rather than just when it comes off the machine or air drier. Despite these drawbacks, slightly greater production and a lowering of costs is being achieved in most of these companies. It is essential for these mills to do this in order that they may continue to compete with the integrated companies of the Mid-west.

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1. Henry Burgee (interview).

CHAPTER V

Economics of the Paper Industry

With a total capitalization of over 65 billion dollars in 1951, the paper and pulp industry ranks well up among the largest industries in the country in this respect. Almost 390 pounds of paper and board per capita were consumed in the United States in 1951.[1] Many varieties of paper are manufactured by the industry. Important divisions within the industry are: newsprint, paperboard, fine wrapping and tissue. Each of these types of paper is based on the special product which it is used for. Each has a different use. Despite the variety of individual and specialized uses for the many different types of papers made by the industry, several specific economic characteristics may be discerned quite clearly.

The first important characteristic of the paper industry is its dependence upon nature for many of its raw materials and resources. Since the discovery of how to utilize wood for the manufacture of paper in 1867, this raw material has been in increasing demand. Wood, notably spruce, hemlock, balsam, fir, poplar and pine (both jack and southern) fulfilled the need on the part of the paper manufacturers for plentiful, workable material with a high cellulose content. The vast forests which stretched across the United States and

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1. Letter from Dr. Louis T. Stevenson.

the sixty to seventy per cent cellulose contained in the wood from those forests provided the ideal material for the manufacture of paper. In 1950- 17,279,000 tons of wood pulp were used in the United States. Of this total, 2,300,000 tons were imported. About ninety-three per cent of the paper made in the United States requires some wood pulp in its manufacture.[1]

Water is another important natural resource used extensively by the paper and pulp industry. A plentiful water supply is a necessity to any paper mill because of the huge quantities of water used daily in the manufacture of paper or pulp. It has been estimated that a modern medium-sized paper mill with a total capacity of about 100 tons daily requires 2,800,000 gallons of water every twenty-four hours.[2] While this figure varies with the type and grade of paper made, most paper mills are located adjacent to a lake, pond, river or stream. It is very common to see pictures of the pulp mill with its large pond filled with logs. Today the paper and pulp industry is the largest user of process water in the United States.

Up until 1915, when individual electric motors began replacing the shafting and belting, proximity to water was important to the paper manufacturer for another reason. By harnessing the movement of the water to a water wheel, power

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1. The Statistics of Paper, pp. 18 and 47.

2. Letter from Dr. Louis T. Stevenson.

could be brought to the machine in the plant. It was because of the possibilities of savings of this nature that Joseph C. Parsons built the first paper mill in Holyoke after the dam had been built to direct water into a canal system for just this purpose. Many of the small New England paper mills were built on streams where a fall of water provided the means to drive the heavy mill machinery. Since the coming of the electric motor, the shafting and cumbersome water wheels of this earlier period have all but disappeared and, consequently, the importance of this use for water has greatly diminished.

In Holyoke, however, many of the mills generate their own electricity by attaching generators to the old water wheels. Since this method is cheaper than purchasing electricity from the Holyoke Water Power Company, the Holyoke mills are able to keep their power costs relatively low.

Many other products of nature are directly used by the paper industry as raw materials. The search for a perfect material from which to make paper has extended in two directions since 1900. First, considerable chemical research has been done to eliminate many of the limitations of wood pulp in making various types of papers. The success of this line of endeavor is illustrated by the increased use of wood pulp in the period since 1880.[1] The second direction which the

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1. That the use of wood pulp increased immensely in the period 1914 to 1935 is evidenced by the following figures:

Writing Paper Production	1914	1935
Rag content	172,728	81,000
Sulphite	75,000	399,500

Source: A copy of an address by Morris C. Dobrow before the Association of Waste Material Dealers.

search has taken is toward finding new raw materials which will have all the advantages of wood and more besides. As examples of these substitute materials which have been only semi-successful, we have: straw, bamboo, jute, manila hemp, bagasse and raw cotton.[1] All have been successful in making paper, but each is limited to making one type of paper successfully. Straw is used to make a fine strawboard. Jute can be used on several papers, but the supply is limited. Manila hemp is particularly useful in making wrapping papers, but that is all. Raw cotton has been successfully used in making all forms of fine and printing papers. The stumbling block here has been the uncertainties of the cotton market. Also, there is still a school of papermakers which insists that used cotton is better for making rag content papers than the raw cotton.[2] The Holyoke area mills obtain their rags (which are all cotton) from the textile mills of the north-eastern part of the United States. These consist mostly of cuttings and trimmings from these mills.

A second characteristic of the paper and pulp industry is the large capitalization needed to begin and continue operations. If any reader doubts this, a trip through any medium-sized paper mill will convince him. The huge machinery needed for all operations, from treatment of the rags or pulp

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1. G. S. Witham, Sr., Modern Pulp and Paper Making, 2nd ed., (New York: Reinhold Publishing Corp., 1942), pp. 22-57.

2. Helen U. Kiely (interview).

in the beaters and washers through the paper machine to the calendars and cutters of the finishing department, should be enough to convince anyone of the large initial capital outlay necessary to operate even a medium-sized paper mill. In the early days of the paper industry in this country, little capital was needed to establish a mill. In the early 1800's from five to ten thousand dollars was all that was necessary to set up an up-to-date hand paper mill. There was very little machinery required, and the operations were dependent upon skill much more than speed.[1] When the Hollander, Fourdrinier, Cylinder and Jordan machines were introduced, however, it became more and more difficult to set up a comprehensive paper mill for less than $100,000. In 1853 Joseph Parsons only needed $60,000 to establish his paper company. When William Whiting came along in 1865, however, he required $100,000 capital to establish a similar paper producing company.[2] Until 1900 the increase in capital from decade to decade was moderate. From 1909 to 1919 the greatest increase was recorded. In that decade there was a capital increase of better than one hundred per cent.[3] One reason for this jump is the influence of inflated dollars caused by World War I. A second and equally important reason was the trend toward integrated paper mills.

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1. Louis T. Stevenson, Background and Economics of American Papermaking (New York: Harper and Brothers, 1940), p. 14.

2. Green, Holyoke, Massachusetts, pp. 83 and 86.

3. Statistics of Paper, p. 59.

An integrated paper mill is one which combines under one management, if not under one roof, the two papermaking operations, pulp processing and papermaking. At the beginning of the twentieth century, the forests of New England began to become depleted. As the demand for paper continued increasing steadily, the industry moved westward to be nearer the source of pulp wood. When the companies built in the Michigan-Wisconsin area, they built integrated mills. These mills were so constructed that the trees were cut in the forests, floated or freighted to a nearby pulp mill, and the pulp went directly from the storage tanks of the pulp mill into the beaters of the paper mill by means of pipes or truck handling. Usually the paper mill was located either in an adjoining building on company property or within easy trucking distance. This production-line securing and handling of materials was the result of careful planning which gave the company greater efficiency and savings in costs. However, because of the extensive operations, a much larger amount of capital was necessary.

Most of the newsprint, wrapping paper and boxboard mills in operation today are of the integrated type. They specialize in large volume production with low unit cost. They can do this successfully because they make a standardized product on very high speed machines. Speeds from 1500 to 2000 feet per minute are not unusual on the huge 210-to-254-inch-width machines in operation in some of the large paper and board

plants.[1]

In a high grade rag writing paper plant, the requirements for capital are somewhat less, while at the same time they include somewhat different operations. This is true throughout the industry. The amount of capital needed depends upon several variables. Some of these are: raw material, nature of the paper, quality and finish of the paper and the extent to which the paper making process is integrated. This may be illustrated by the writing paper mill just mentioned. Little, if any, wood pulp would be used in this type of mill. Much equipment would be necessary, however, to prepare the rags for the beating process. This stage of the process requires much equipment, such as rag room, rotary, boilers, rag-washing engines and drainers which a pulp mill would not have. Also, a fine paper mill would usually stock considerable supplies of finished paper in order to meet wholesalers' demands quickly, and this would require capital which the large integrated mills do not need as much.

In Holyoke, all of the paper mills are non-integrated or converting paper mills. They do not have the adjacent source of raw material supply, which the northern or mid-western mills have. The mills in the city making high grade rag content papers obtain their rags principally from the textile mill cuttings. All of the mills use wood pulp to some extent, and this is obtained mostly from the West Coast. The non-

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1. Witham, Modern Pulp and Paper Making, Chmp. 13.

integrated mills do not tie up large amounts of money in producing raw materials. They buy pulp as they require it, except for certain periods when large stocks are purchased because of a price gain or an expected price increase.

Paper mill machinery varies according to the type of paper made and the finish to be given to the paper. Most of the machinery in all paper and pulp mills is highly durable. For example, a paper machine will last as long as the metal it is made of will last. Only minor adjustments and periodic repair need to be done on the machine for twenty or thirty years. Improvements which do not involve replacing the entire machine may be made regularly in order to insure maximum production.

On the whole, paper mill machinery is immobile and fixed. Several reasons for this are:[1]

1. Much of the cost of installing paper mill machinery is involved in assembling, erecting and adjusting the machinery. It is huge and heavy, and extensive foundations are necessary.
2. Each paper machine is a special machine in the sense that it is built for the plant purchasing it and is fitted to meet that plant's particular requirements. As a result, the machine is not salable to another paper manufacturer. This is true of all the mill machinery, except finishing

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1. Letter from Dr. Louis T. Stevenson.

equipment and motors. Most of the machinery is unsuitable to other industries, except the two mentioned and possibly auxiliary steam plants.

3. The paper mill site and buildings are also unsalable, except for junk or water rights because they have to be specially adapted to the machines within and the product to be made.

It is possible now to realize why paper mills are kept operating even though they are not making a profit. So long as sales revenues exceed variable cost, it is of more benefit to the owner to keep the mill running than to shut it down and allow the machinery to deteriorate. In the short run many times if variable costs are not met, the mill owner decides to make paper anyway and keep his machinery and workers busy in order to be ready when demand or prices increase.

There are other gains to be had also. It is essential for the machinery of a paper mill to operate on a 24-hour basis. The peculiar principle of the Fourdrinier paper machine requires continual operation once the machine has been started and the sheet of paper has begun to form and pass through the machine. If the web of paper is broken on the machine for any reason, much time and many delicate adjustments must be made before production can resume. Even before the pulp reaches the stuff-box of the machine, continual operation is necessary, because the beaten pulp cannot be stored. Once it has been beaten the proper length of time, it must be sent to the machine directly in order for the machine to pro-

duce a uniform sheet. Stopping any one of the operations in a paper mill before the paper reaches the finishing department means idleness for that part of the production line which follows. In this respect, papermaking may be likened to an assembly line in any of our modern industries.

Near the turn of the century, when the workers in the paper industry in Holyoke tried to install the three-tour system, the mill owners objected strenuously. The reason for their objection was the difficulty of keeping the paper machinery operating properly when three tours or shifts of workers must be changed every twenty-four hours. The old-time paper makers believed it was difficult enough to make good quality paper with only two tours; it would be well nigh impossible to make it with three. In Holyoke, the battle waged for almost a decade before all the paper mills agreed to the eight-hour shift in 1914.[1] By 1930 almost all of the mills in the country were operating on a three-shift system.

The equipment in a paper mill must be constantly examined to insure continuous operation. Maintenance costs are high because of this and because many of the machines running twenty-four hours a day must be continually adjusted or vital parts replaced. In the pulp mill, grinders are operating around the clock for months on end, and the surface of the grinder must be checked and reburred. In the paper mill, the paper machine must be kept operating at all costs. Repairs,

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1. Green, Holyoke, Massachusetts, pp. 207-221.
Harold T. Martin (interview).

if necessary, are undertaken on Sundays. Emergency repairs must be hurried through. In replacing a wire on a Fourdrinier paper machine, workers in the Holyoke mills receive half a day's pay besides their regular pay during the hours they work on the replacement.[1] This acts as an incentive to the workers to get the machine back in operation as soon as possible.

When the paper mill is repaired or renovated, it generally shuts down completely. This occurs very infrequently, as when a new paper machine is being installed or the old machine is being rebuilt. Shrewd management usually takes this opportunity to expand the length or width of the machine or increase its speed so as to obtain greater production. The Crocker McElwain and Chemical Paper Companies have followed this policy throughout the period under study. During the 1907 recession, the Crocker McElwain Company renewed and modernized its equipment, and both the Crocker McElwain and the Chemical Paper Companies were expanded and the machinery brought up-to-date during the 1921-1923 recession.[2] The American Writing Paper Company also modernized its mills at intervals. Instead of taking advantage of the depressed periods, however, it usually did repairing and renovating during prosperous times.[3] This policy is a poor one for any

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1. Edmund Brogle (interview).

2. Walter Scott (interview)
   Green, Holyoke, Massachusetts, pp. 228-229.

3. Russell Madden (interview).
   Helen U. Kiely (interview).

business to follow, but it was especially harmful to the over-capitalized "trust."

One final characteristic of the pulp and paper industry of the United States which must be looked at is the almost absolute predominance of the corporate form of business organization. In the early days of the paper industry, the partnership was the most frequently used type. The first paper mill organized in the United States was a partnership between William Bradford, a colonial printer, and William Rittenhouse, a papermaker. In 1872 "Lockwood's Directory" listed the companies in the industry as follows:[1]

Individual Proprietor	35.8%
Partnership	45.8%
Corporations	13.8%
Undetermined	4.6%

By 1938 the classification of companies in the industry had changed to the following:

Corporations	96%
Partnerships	1%
Individual Proprietor	1%
Undetermined	2%

In 1872 more companies were partnerships than individual proprietorships, and between the two, more than eighty per cent of the companies were included. The corporation was little used at this time because of the small amount of capital needed to establish a mill. Most of the paper mills were not very large, and there was little need for the complex organizational form of the corporation. The 1938 figures have changed little

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1. Stevenson, Background and Economics of American Papermaking, pp. 93-97.

down to 1950.[1] The corporation seems destined to remain the most useful form of business organization in the paper industry.

Following the trend observable in the industry, the Holyoke paper companies generally began operations as partnerships or individual proprietorships, and ended up at the turn of the century by incorporating. The stock and control of the majority of the paper companies was closely held, usually by a local family or group of investors.[2] The "trust" was the only paper company in Holyoke to have its stock listed on the exchanges. The corporate form of business organization was helpful in at least one important instance to Holyoke paper companies. When the Crocker McElwain Company wanted to purchase the Chemical Paper Company and still keep each company an independent financial unit, the owners resorted to the corporate form of organization. This enabled them to operate both companies through one management and protected their thriving Crocker McElwain Company from the doubtful liability of the Chemical Paper Company.[3]

Summing up the major characteristics of the pulp and paper industry very briefly, we find the following:

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1. Letter from Dr. Louis T. Stevenson.

2. Elmer Cooley (interview).
   Green, Holyoke, Massachusetts, p. 91.

3. Ralph Higgenbottom (interview).

1. The industry depends greatly upon natural resources, the most important of which are pulp wood and process water.
2. Wood pulp mills, because of greater efficiency and cost advantages, are usually located close to the forests. This is true for both the integrated and non-integrated pulp mills.
3. Many paper mills are directly connected to their own pulp mills. These are called integrated paper mills. There are also independent pulp mills. These are sometimes connected with lumber companies. Paper mills which do not manufacture their own pulp are known as non-integrated paper mills.
4. The industry is one of very high capitalization. The major reason for this is that the paper mill machinery is large in size yet delicate in control and operation.
5. An essential feature of the industry is that the paper making machinery must be kept operating twenty-four hours per day, six days per week. Reasons for this are:

   a. High capitalization and, therefore, necessity for high volume production.
   b. Nature of the process involved in making paper.

6. Both pulp and paper mills are immobile to a high degree because of the necessity of proximity to raw materials and because of the uniqueness, bulk

and construction of the machinery. The immobility of the physical plant and machinery is accompanied by a like immobility of capital invested in these factors, because most of the plant and machinery of pulp and paper mills can only be used for production of paper and pulp. When a paper mill goes out of business, the junk yard is the next stop for most of the machinery, and extensive remodeling is necessary before the building itself can be readied for other types of work.

The aforementioned characteristics are the most easily observable for the industry.

Other economic factors are of importance. Nationally the pulp and paper industry has always attempted to gain increasing returns to scale by building larger and faster paper machines and more efficient integrated plants to house these machines. The economies achieved by thus increasing production of a standardized paper or board are considerable. The larger the mill you build, the less labor cost becomes. The following table illustrates the increased application of capital to paper mills in the Northern Zone of the United States:[1]

Capacity Class (Tons per day)	Man Hours Per Ton of Paper Made	% of Labor Cost to Value
0 to 10	72.09	$18.83
11 to 25	58.92	17.93
26 to 50	35.78	16.40
51 to 100	24.37	14.66
101 to 200	22.20	14.74
201 and up	17.60	11.87

1. Stevenson, Background and Economics of American Papermaking, pp. 113-114.

The increased productivity of labor is expressed in Column Three. A look at Table XI[1] will show the reader the growth of capitalization in the paper industry in the United States in the past twelve years.

The local paper industry has been unable to take advantage of the decreased costs brought about by integrating and standardizing production. Integration has not been adopted by the local paper industry because it does not make the kind of standardized paper that can be made on the large, fast paper machines. Much of the paper production in Holyoke is rag content paper, and this requires much different methods of production than may be used in producing wood pulp papers. Integration would also be impractical for the mills in the Holyoke Area because the bountiful supply of pulp wood is not available. The mills of the area rely upon market wood pulp to supply their needs. The textile mills of the New England region supply the local mills with their rag raw materials.

The non-integrated paper mills have continuously offset the increasing costs and decreasing returns by introducing technical improvements in every stage of paper production. Some of these improvements were mechanical, others were chemical. New sources of raw materials for making pulp and new methods for treating pulp to produce special papers are examples of the chemical improvements. Mechanical improvements have been innovations such as the Jordan refining engine and

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1. On page 100.

Table XI

A Summary of Financial Data of the Paper Industry

		1939	1940	1941	1942
Total Assets	(billions)	$2.36	2.46	2.61	2.68
Net Worth	(billions)	$1.70	1.77	1.86	1.92
Net Sales	(billions)	$1.45	1.75	2.36	2.46
Federal Taxes	(millions)	$18	61	198	223
State and Local Taxes	(millions)	$31	34	43	42
Workers	(thousands)	138	146	161	164
Wages	(millions)	$176	195	246	284
Capitalization	(billions)	$1.7	1.77	1.86	1.92
Pulpwood Consumed	(million cords)	10.8	13.7	16.3	16.8
Index of Unit Production Per Man Hour		100.0	101.9	104.6	101.9

1943	1944	1945	1946	1947	1948	1949	1950	1951
$2.76	2.81	2.97	3.28	4.03	4.72	4.89	5.59	6.60
$1.99	2.05	2.13	2.42	2.87	3.37	3.59	4.08	4.40
$2.59	2.77	2.88	3.55	4.77	5.43	4.79	5.89	7.22
$212	219	173	208	355	346	264	529	982
$42	42	41	49	N.A.	N.A.	N.A.	N.A.	N.A.
160	158	159	184	195	205	198	205	212
$320	339	352	429	530	612	614	694	780
$1.99	2.05	2.13	2.42	2.87	4.67	4.89	5.60	6.59
15.0	16.1	16.2	16.8	18.4	20.9	19.6	22.3	24.1
96.3	97.2	99.1	104.6	109.3	112.3	115.7	125.0	128.6

Source: Capital and Income Survey of The Pulp and Paper Industry 1939-1951
American Paper and Pulp Association 1951

the air-drier, or such insignificant little improvements as a small instrument to remove condensed water from the drying rolls on the paper machine.[1]

The Holyoke mills have enjoyed advantages in transportation which have helped them to offset some increasing costs. By shipping prepared wood pulp by boat through the Panama Canal, costs of transportation have been materially reduced. In the 1920's a forwarding service was set up in Holyoke to enable paper manufacturers to save on rail carload shipments of paper. The Sheldon Transfer Company fulfills this job by collecting odd lots and assembling them in carloads so as to gain the savings in freight which result. The paper mills usually ship carload lots direct from the mills if large enough orders are obtained. Most of the major paper markets, i.e., New York, Philadelphia, Boston, Washington and Hartford are within a 500-mile radius of Holyoke. Since several Holyoke paper companies (Valley and Crocker McElwain) specialize in small lot orders of special paper and speedy delivery, the use of the forwarder results in substantial savings over a period of time.[2] Wood pulp shipped by railroad from Boston to Holyoke also receives a special commodity rate which results in a saving to the Holyoke mills. Pulp can be obtained for less freight cost when shipped through the Panama Canal or from Europe and hauled from the port of Boston at this rate than if it was rail freighted across the country.[3]

1.Walter Scott (interview); Henry V. Burgee (interview).
2. Ralph Higgenbottom (interview).
3. Walter Scott (interview).

CHAPTER VI

Rise of the Converters

Throughout the paper industry of the United States the most important effect of the depression period was the loss of demand. Since the demand for paper and paper products is closely related to business activity in general, it is not difficult to realize why many companies were forced into receivership and bankruptcy during the depression years. The capable paper mill operator must be ever watchful for changes in the economy which might affect the demand for the type of paper he is making. In order to properly understand the nature of the demand for paper, one must first study the characteristics which are typical of this demand.

Paper was found to be useful and less expensive for hundreds of jobs and was substituted for other materials through the years. Each of these jobs is a use for paper which fulfills a human want or desire. For example, we have the use of paper for writing material, newspapers, books, periodicals and wrapping bundles. Each of these uses demands a certain type of paper to supply it. The demand for the article is a special demand depending upon the use to which it is to be put. This is true of paper, because a person would not use wrapping paper to print a newspaper on. Nor would anyone use a 100 per cent rag content bond paper to make napkins.

The demand for paper fluctuates greatly. The most important cause of much of this fluctuation is the ups and downs

of general business activity. The demand for most types of paper varies considerably between years of prosperity and years of depression.[1] When consumer incomes are high, advertising expenditures increase, and newsprint consumption also expands. Consumption of thousands of goods wrapped or shipped in paper or board also increases the demand for paper during prosperous times. Much of the increased production of paper and the loss of consumption during recession periods has been taken up by the steady upward trend in consumption for most types of paper. This trend has been brought about by the increase of population in the United States and by the success of the research division of the paper industry in developing new uses for paper.

An important and interesting condition which develops in the paper industry in a time of depression or recession is known as "grade shifting." This is a term used to describe the action of the paper manufacturer who stops producing one type of paper because it is unprofitable and begins producing a more profitable type of paper.[2] Grade shifting may occur when a paper producer shifts from making one kind of paper to another, or it may involve the shift from one grade of the same kind of paper to another grade.

The producers in the paper industry are able to shift

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1. Stevenson, Background and Economics of American Papermaking, pp. 157-162.

2. Ibid., p. 141.

grades or types of paper because of the nature of the production process. Within limits a paper mill is able to shift from making one kind of paper to making another kind without a major outlay for equipment. This is possible because of the similarity of equipment. The same paper mill may make several different kinds of paper. Most mills can shift to a grade higher or lower with no trouble or outlay whatever. For example, there would be little difficulty in shifting the production of a mill designed to produce newsprint over to make certain grades of book paper. Again, a mill that makes newsprint could also shift to the production of wallpaper with a minimum of difficulty. There are limits beyond which this practice cannot go. A mill making board could not shift to the making of writing paper without costly adjustments. By the same token, a fine writing paper mill could ill afford the expense of shifting production to manufacturing newsprint.

Grade shifting has a direct relationship with the Holyoke paper industry. This practice is a common one and has been used many times in the history of papermaking in the United States. By creating a large and potential supply of all kinds of paper, this practice has effectively hampered any attempt at monopoly or monopolistic control which develops in the industry. When the American Writing Paper Co. was formed in 1899, it was in a very strong position in the writing paper and fine paper fields. The organizers of the "trust" used this as an argument to convince independent paper manufacturers to sell out and join the new organization. Many independent

mills did proceed to do this, others did not. When it was incorporated, the "trust" could rightfully claim that it controlled about eighty per cent of the fine paper production of the United States. It was thought then that within five years the remaining independent fine paper companies would be ready to sell to the "trust." This failed to happen. Instead, by 1905 the independent companies found they could not only compete with the "trust," but prosper as well. Several new independent companies entered the fine paper field in this period, and by 1910 the output of the "trust" had dropped to about forty per cent of the total fine paper output.[1] Grade shifting was mainly responsible for much of this increased competition.

Holyoke experienced the effects of grade shifting again during the 1930's. Until 1910 grade shifting in the Holyoke paper industry usually operated in the direction of higher-priced papers. The early paper mill owners, as we have pointed out elsewhere, made the cheaper papers when they first started their mills and worked up to the more expensive lines of fine papers. With the introduction of wood pulp, the production of cheaper papers became more widespread. During the 1920's the impact of sulphite pulp papers struck the fine paper field. A sheet of bond paper could be made without rags that would look almost as good as the rag content bond and

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1. Western New England 1(1):7 and 8.

would cost less to make.[1] The result was a shift of consumer demand for many papers away from the higher priced papers and toward the lower priced papers. Consumers, both individual and business, found a low priced paper served just as well as the higher priced paper for many jobs. The introduction of the air drier also helped to strengthen this trend.

In Holyoke, where most of the production of paper was of the high quality, high priced, fine paper variety, several of the mills felt this change greatly. The Parsons Paper Co., American Writing Paper Co., Crocker McElwain Co., and Valley Paper Co. concentrated much of their production in the high priced papers. The pressure of demand for lower cost papers forced these companies to expand their production of lower content rag papers. More wood pulp was used by the companies and rag percentages went down from 100 per cent, which was the common seller before 1920, to seventy-five per cent, fifty per cent, twenty-five per cent, and all sulphite papers.[2] By shifting grades of the same type of paper during the early 1930's, Holyoke's independent paper manufacturers managed to weather the storm of the depression.

As the demand for paper decreases during a depression, the decline of prices follows very closely. The decline of prices is usually a general decline and a very steep one. This

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1. 250 Years of Papermaking in America (New York: Lockwood Trade Journal Company, Inc., 1940), pp. 24-35.

2. Walter Scott (interview).

has been historically true for over a century. In 1861, after a period of severe readjustment just prior to the Civil War, twenty-one of the thirty-six manufacturers of fine papers met at Pittsfield, Massachusetts to organize a protective association. They desired to raise prices which had fallen drastically as the result of a decrease in demand. They agreed to reduce output by about one-third for about three months. This was the first trade association established in the paper industry of the United States, and it is still in existence today, playing an active part in the fine paper division of the paper industry.[1] At the time it was formed a charter was drawn up, officers elected, and the association was named the Writing Paper Manufacturers' Association. The Parsons Paper Company and the Carew Manufacturing Company were charter members of this organization. In later years, several other Holyoke paper mills were to join the association. Chief among these were the American Writing Paper Co. and the Crocker McElwain Co. Mr. Whiting, the founder of the Whiting Paper Co., was president in one of the early years of the Association; and, after the turn of the century, Mr. Crocker and Mr. Burgee from the Crocker McElwain and Parsons Paper Companies respectively, were elected to the president's post.

Other attempts to achieve stability of both prices and production were tried by the organization. After 1890 these attempts ceased, and the Association devoted itself to serving

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1. The Progress of Paper, pp. 376-378.

its members with information and various services. In the main, the fine paper division of the paper industry has been much freer of price-setting influences since 1900. There has been no price leadership in the fine paper division of the industry either. There has been most severe competition in the industry as a whole, and Holyoke has been no exception.

While the paper industry has been affected by the overall decrease in demand, which occurs during the recession phase of the business cycle, the trend for the entire industry has been a continual upward one. A study by two statisticians for an article published in the Business Record for May 1952 reveals that the growth of the paper and board industry in the United States has been phenomenal.[1] Very few industries with statistical histories as long as the paper industry can boast of such sustained and robust growth. From an annual consumption total of about 2,000,000 tons in 1900, the industry in 1950 reached the total of nearly 27,000,000 tons. With the exception of newsprint production, the lowest rate of growth in 1950 was about three per cent.[2] This was in printing and converting paper production.

Another important consideration expressed in this article is the fact that the growth rates of the paper industry forty years ago have been sustained to a very high degree. For example, consumption of paperboard in 1910 was increasing at a

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1. See Table XII, p. 110.

2. Ibid.

Table XII

Comparison of Growth Rates Between Paper Industry and Other Major Industries

Commodity	Yrs. Covered	1910	1920	1930	1940	1950
Board	1899-1949	8.00	6.75	5.69	4.79	4.04
Printing and converting	1899-1949	4.42	4.00	4.62	3.28	2.97
Fine Paper	1899-1949	4.89	4.41	3.97	3.58	3.23
Coarse Paper	1899-1949	2.89	3.23	3.51	3.90	4.24
Tissue Paper	1899-1949	8.74	7.71	6.80	6.00	5.29
Construction Paper and Board	1899-1949	4.40	5.35	6.29	7.24	8.19
Total Paper & Board[1]	" "	5.57	4.95	4.40	3.91	3.47
Other Industries						
Aluminum Production	1891-1949	15.65	11.48	8.42	6.18	4.54
Bituminous Coal Production	1870-1949	2.75	1.72	1.08	.673	.421
Copper Consumption	1885-1949	5.12	3.88	2.94	2.23	1.68
Cotton Consumption	1870-1949	2.72	2.26	1.88	1.56	1.30
Fuel Production	1880-1948	4.51	3.84	3.26	2.78	2.36
Gross National Product	1890-1949	3.41	3.29	3.17	3.05	2.94
Pig Iron Production	1875-1949	3.29	2.21	1.48	.995	.668
Steel Ingot Production	1870-1949	5.37	3.56	2.36	1.57	1.04

Source: A.R.B. and F.W.J., "Growth Patterns in Paper Industry," reprinted from Business Record (May 1952), pp. 184-187.

1. Does not include newsprint.

rate of about eight per cent per year. In 1950 the rate was still a solid four per cent. Fine paper is another example. In 1910 fine paper consumption was increasing at a rate of about five per cent; in 1950 the rate of growth had dropped to only slightly less than three and one-half per cent. Coarse paper and construction paper are actually growing at a faster rate today than in 1910. Table XII illustrates the growth of the paper industry in comparison with several other important industries.

The greatest decrease in rate of growth has been in the newsprint industry. This decrease is explained by the Canadian Reciprocity Act of 1913 that removed newsprint from the duty list of the tariff. As a result, the Canadian newsprint industry expanded while our own languished. The table shows clearly that the paper industry has maintained its rate of growth since 1900 at a higher percentage than the other major industries listed. The depressions of 1921-23 and 1930-36 have helped pull the percentages down. However, the effect of the depression has been softened by the continued high rate of growth.

It is also important to note that the lowest rates of growth were in the printing, converting and fine paper groups. These are the kinds of papers that Holyoke's paper mills specialize in making.

The statistics agree very well with the facts for the local paper industry for the past fifty years. Since 1893 only three successful paper manufacturing companies have been

organized in Holyoke.[1] Before 1899 twenty-two successful paper manufacturing concerns were organized. Most of the oldest mills in the city were organized in this pre-1899 period. This was the great growth period of the Holyoke paper industry. Not only were many new paper companies founded in this period, but those that were established grew continuously. They were constantly adding new machines, expanding the size of the plant or establishing new concerns, either in the city or in neighboring communities. Since the turn of the century Holyoke's paper industry has had a difficult time maintaining its position in the industry.

There is no single reason for this change in the local paper industry. Rather, there are a series of events, each of which contributed to the overall result. Some of these events were national in effect. For example, the very basic change throughout the paper industry from using rags as a raw material to using wood pulp. It is undoubtedly true that, if the same percentage of rag content paper were used today, with the huge increases in consumption, the local paper industry would have continued to grow and prosper. The research developments, which enable paper makers to produce a good quality paper using wood pulp, also contributed to this change. Holyoke paper companies may still dominate the rag-content paper market, but the size of that market has decreased con-

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1. These were: Crocker McElwain Company, Taylor Logan Company and Whiting and Company, Inc.

siderably since 1900.[1] While such industry-wide changes have affected Holyoke paper manufacturers adversely, the environment of the local industry has also been a factor in hindering further development and growth of the industry in its present location. The canals which supply the paper mills with power and process water are a major limiting factor. Paper mills built before 1900 are not efficient enough for the modern papermaker. In order to change many of the mills, additional space for continuous and efficient operations must be had. With the canals running on either side of the mills, most of them find it impossible to change their plants. Another important consideration is the dependence of Holyoke's paper industry on market pulp. With no local forests where wood for making pulp could be obtained, the paper companies in the area have had to rely on the large pulp companies of the Mid-west and the Pacific Coast. This deficiency prevented the local paper manufacturers from erecting integrated, more efficient paper producing plants, which have been responsible for much of the growth of the paper industry in other parts of the country.

The high percentage of growth in the other divisions of

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1. Speech by Morris C. Dobrow presented at meeting of Association of Waste Material Dealers in 1939. Mr. Dobrow asserted that: In 1914, 70 per cent of all writing papers made had rag content; 30 per cent were sulphite. In 1936, only 17 per cent were rag content and 83 per cent were sulphite. Rag consumption dropped from 87,000 tons in 1914 to 58,000 tons in 1929 to 41,000 tons in 1935. The effect of these figures on the Holyoke paper industry is positively evident today.

the industry has been the result of many factors. Population growth, the development of the wood pulp processes (i.e., sulphate, sulphite, soda and groundwood),[1] the rapid development of the Southern craft industry and the increased productive efficiency of the Pacific Coast news and book paper industry, have all been influential in increasing the production of paper and board. The many research laboratories and agencies of the paper industry have always helped by finding methods to use cheaper and more plentiful raw materials and then finding hundreds of new uses for paper and paper products. Without the help of the laboratories and chemists, the high rate of growth of the paper industry could never have been sustained.

Paper production closely follows the ups and downs of general business activity. Its high and low points compare closely with the cyclical movements we have had in the United States in the past half century. A look at the column headed "Per Cent of Capacity" in Table IV will demonstrate this.[2] That the Holyoke paper industry is typical of the industry for the nation may be grasped by examining the column headed "Product Value"[3] in Table II. To a limited extent, the industry is affected by seasonal variation. The months of greatest activity are usually March through June and September

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1. See Appendix B.

2. See Table IV, p. 21.

3. See Table II, pp. 13-14.

through November. The summer months from June through August are the slack months. Sometimes slumps develop at various times for special reasons, such as shortages of raw materials or a sudden downturn in demand. In Holyoke the seasonal variation is very similar to the rest of the industry. June, July and August are the "down" months, and sometimes there is a slowdown in January or February. The practical paper manufacturer uses these "down" months to give his help their vacation time and to clean and repair machinery. Installation of new machinery also takes place in the summer months when possible, because then less production time is lost.[1] Sometimes the Connecticut River closes some of the mills also, as when there is a flood or when the water in the river dwindles to a mere trickle in a very dry season. During times of drought the mills with temporary mill powers do not receive all the water they desire, because every drop is necessary to supply those mill sites that own permanent mill power rights.

The factors which have hindered the local paper manufacturing industry from growing have not been operative in the local paper converting industry. The distinction between a paper manufacturer and a paper converter is a most important one. The paper manufacturer is primarily concerned with making paper from the various raw materials. The paper converter is primarily concerned with treating, embossing, printing and

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1. Walter Scott (interview).
   Elmer Cooley (interview).

various other finishing operations which he performs upon the readymade paper. Sometimes, of course, a paper manufacturer may do some converting functions, such as putting up typewriter paper in boxes. There are also converters who own their own paper mills which only produce paper to supply their converting operations. In the Holyoke Area there are examples of both types of mills.

Small converting concerns originally established themselves in Holyoke because of the proximity to the supply of fine paper being produced by the "Paper City of the World." The first converting plant, the Hampden Glazed Paper and Card Company, was established in Holyoke in 1881. In 1889 a second converting concern, The Smith and White Manufacturing Company (later White and Wyckoff Manufacturing Company), began operations. These two companies, along with The American Tissue Mills, are the three largest converters in the local industry. The latter was established by the Perkins Family in 1899 and was originally known as the Japanese Tissue Mills.[1] Each of these companies have exhibited the growth characteristics of the local converting industry. Space does not permit a detailed discussion of each; however, taking the White and Wyckoff Manufacturing Company as a typical example of the development of paper converters in Holyoke is fair, because it typifies the rise of the large converters.

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1. Pamphlet put out by American Tissue Mills during the 1930's. (Private source of information)

Beginning in 1889 as a partnership between F. D. Smith and Edward N. White, the Smith and White Mfg. Co. made pads and tablets in a small building in Holyoke.[1] It employed eight persons at this time. As the business prospered additional help was added. In 1891, J. L. Wyckoff was hired as a salesman, and in this same year the building housing the company was enlarged. In 1893 Messrs. White and Wyckoff purchased F. D. Smith's interest in the business and incorporated it as the White and Wyckoff Mfg. Co. In 1898 the buildings were again expanded as the business continued to grow. This growth forced the company to enlarge the existing plant in 1907 and again in 1916. By this time the company had established itself as one of the leading papeterie manufacturers in the country. In 1927 the National Papeterie Company, one of the oldest and largest stationery manufacturers in the country, was merged with the White and Wyckoff Mfg. Co.

Just after the turn of the century (about 1904) the White and Wyckoff Mfg. Co. ceased making pads and tablets and devoted their production to stationery and papeteries of all kinds. Later on the company introduced Christmas and everyday greeting cards. About 1916 it moved into the building it presently occupies with six floors and more than 171,000 square feet of floor space. In 1940 the company had one of the largest printing departments in New England. There were about fifty presses of every size and description. The

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1. Holyoke Transcript, February 20, 1939; August 1, 1944; August 24, 1947.

company has always been alert and progressive in its anticipation of public demand for its products. It maintains branch offices in New York, Chicago and Canada. National advertising of some of its stationery and greeting card line has made its products very well known. The company has had able managerial leadership, and its profit and dividend records over the years have been highly favorable. The growth of this company from the small concern employing only eight workers to the large plant which, at present, employs about 350 workers and last year had sales of over $2,000,000 is indicative of the growth of converting concerns in Holyoke.

Besides the "Big Three" which we have just mentioned, other highly successful converting companies began operating in Holyoke after 1900. The most spectacular and unique of these was the Marvellum Co., founded in 1921 by three men, each of whom had a type of knowledge necessary for establishing a converting company.[1] George Senseney was the artist who developed the basic idea of coagulating varied colored liquids, so that when they were applied to paper a new type of decorated paper would be the result. A chemist, Russell Bracewell, helped the artist to work out a hand process for making this decorated paper of many varied colors. Since this was a slow, laborious operation, an engineer was needed to build a machine capable of duplicating the hand work. Francis Heywood was the engineer. Getting together in 1912,

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1. 250 Years of Papermaking in America, p. 105.

these three men worked on their process for several years. Then World War I interrupted when there were terms to be served with the Armed Forces. Not until 1921 did the company become a reality. By 1922 "business was booming." A plant with 5,000 square feet was outgrown, and new facilities had to be found. In 1928 the business outgrew the second plant and took over the large factory of the Whitmore Mfg. Co. in Holyoke.[1] New machinery was added, and the fancy papers and cover stocks for which the Marvellum Co. is famous began to appear. The expansion of the business continued steadily into all fields of converting papers. Development of new machinery and presses has been carried on continually by the aggressive management team. During the 1930's several entirely new machines were installed in the plant for faster, more highly regulated, production of designs and specialty papers. In 1932 the company organized a subsidiary named the Beveridge Marvellum Co. This company had its plant in South Hadley. It was set up to supplement the line of coated cloths and papers produced by the parent company. Pyroloxin coated papers, which were just beginning to be introduced on the market at this time, were to be a specialty of this new plant. About 165 persons were employed at both plants.

Throughout World War II the company worked almost exclusively on U. S. Government orders. Before the war was over, however, new lines of cover and specialty papers were

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1. Holyoke Transcript, September 17, 1947.

being developed to be prepared for the post-war business. From an idea in three men's minds to the present large business is the remarkable story of this successful converting company.

Many of the converting companies in the city are not as large or as well known as the few I have described. Some of these are the Hazen Paper Co., specializing in coated and decorative papers of all kinds; the Highland Manufacturing Co., making wedding and business announcements and many types of ruled papers; the Morart Gravure Corp. with special machines for doing gravure work and also gumming papers; lastly, the American Pad and Paper Co. which makes commercial forms and loose leaf fillers as well as all types of pads and tablets.[1] There are many other small concerns doing specialty work. New innovations appear from time to time and result in the formation of another company. The Plastic Coating Corp. is an example of these concerns working in the field of plastics, and cloth and paper coating.

The paper converting industry in Holyoke has shown remarkable growth in the past fifteen years or so. Table XIII gives some idea of this continued growth. The thirty years reviewed in this table have proven to be most progressive ones for the local converting industry. While most of the newly-established companies are small compared with the large, long-established companies, their prospects for continued growth

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1. Holyoke City Directory, 1948-1952.

Table XIII

Data on Converting Companies

in Holyoke 1922 - 1950 (even years)

Year	No. of Establishments	Capital Invested	Wages Paid During Year	Value of Products
1922	8	$ 3,519,791	$ 667,968	$4,444,952
1924	7	3,471,797	628,025	4,303,067
1926	7	3,453,640	676,160	4,585,563
1928	9	3,606,769	681,309	4,359,495
1930	10	4,153,655	753,527	5,162,806
1932	9	4,046,939	584,384	3,436,272
1934	14	5,655,756	1,138,160	5,710,285
1936	17	6,169,074	1,380,892	7,857,474
1938	17	5,774,687	1,354,854	7,409,625
1940	16	5,876,627	1,329,200	7,976,765
1942	17	6,543,240	1,792,565	10,965,811
1944	17	7,324,927	1,935,724	13,857,837
1946	18	7,732,815	2,745,443	15,364,187
1948	18	8,250,344	2,590,706	15,444,174
1950	18	11,056,950	2,855,382	18,903,894

Source: Census of Manufactures, City of Holyoke, Massachusetts, Commonwealth of Massachusetts, Department of Labor and Industries, Division of Statistics.

and expansion appear to be good. In general, the local converting industry did not suffer from the economic "if's" that the papermaking companies were plagued with. The management of the converting companies has been most progressive and up-to-date. Their plant equipment, on the whole, is modern and efficient. New developments from research and investigation of demand are constantly appearing from the presses of one converter or another. A comparison between the above table and Table II[1] suggests the conclusion that the converting industry is assuming an increasingly more important role in the industrial life of the city. While the growth of the paper industry has been reversed in the past fifty years, the converting industry has continued to grow significantly. This is a very healthy trend which should help the city to maintain its present industrial stature.

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1. Compare Table XIII, p. 121 and Table II, pp. 13-14.

CONCLUSION

Throughout this paper I have tried to present the most significant changes which have occurred in the Holyoke paper industry. Some of these were caused by occurrences entirely divorced from the local industry. The effect of these events was most important to the local industry. The formation of the "trust" and the impact of the Great Depression were two examples of these occurrences. The changes wrought by the former were much more significant than those brought about by the latter.

It may rightfully be argued that the formation of the "trust" was the turning point in the history of the local industry. During its first fifty years of existence the industry exhibited continual growth, vitality, prosperity and progressiveness. After the "trust" was formed a period of stagnation was evident for some years before the gradual shrinking of the "trust" began. This backsliding or shrinking of the "trust" was caused by both internal and external factors. The internal factor which I considered the most important of the two was the lack of sound management. From the very beginning the "trust" was plagued by this drawback. As the firm matured, the bad effects of the early mismanagement multiplied and resulted in several failures of the firm.

The external factor affecting the "trust" was the changes in the paper industry outside of Holyoke. The development of wood pulp papers, faster machinery and the integrated paper mills all combined at one time or another to change the

demand for paper away from the types made by the Holyoke companies. In this respect these changes also affected the local independent companies. However, the financial and management positions of these companies were sounder and stronger than those of the "trust" and they survived while the "trust" failed.

The independent paper companies maintained their number in the local industry and even added to it. Early in the fifty-year period under discussion, the independent companies discovered they could compete successfully with the "trust." The independents had more to fear from the mills outside of Holyoke than they did from the "trust."

As the new pulpwood processes were developed and perfected, the paper companies of the northeast began moving to the mid-west to locate closer to the forests. Today these mills are the major competitors of the local mills in the writing paper field. With more modern equipment and the use of the principle of integrating the processes of pulpwood and paper making these companies are able to produce paper at a lower cost than the local companies.

Another factor contributing to the loss of aggressiveness on the part of the independents was the shortsightedness of many of the company owners who usually did not inject themselves into their business except to collect their salaries or dividends. The equipment and processes in most of the mills became worn and obsolete. After the 1930 depression most of the independent companies began programs of moderni-

zation and improvements to bring their mills up to date. This program is now a continuing procedure with most of the local companies.

In the light of its long history and its peculiar location with a plentiful water supply, the paper industry will probably continue to produce in the area. In the future, however, it will emphasize the production of specialty types of paper. These specialty papers require exacting standards and specifications in order to perform technical and minute jobs. The larger, newer mills outside of the northeast area will continue to take advantage of current research and developments to produce finer sheets of paper for many of the purposes for which Holyoke mills are today manufacturing paper.

With smaller machines and highly skilled labor the local mills are ideally suited for producing specialty papers. In the future they will shift more and more to manufacturing paper for many highly technical purposes. If the local companies continue to compete in the production if fine papers with the larger, more modern companies, their number will most certainly be reduced. This is not a very pleasant outlook for the Holyoke paper industry, but it is the inevitable conclusion one reaches after reviewing the history of the local industry and the major trends in the overall paper industry.

With determination and progressive thinking the local paper industry could make the area that was once the home of fine paper production, the center of specialized paper pro-

duction in the United States. This is a prospect to be sincerely hoped for and worked for by all concerned with the survival and growth of the Holyoke paper industry.

APPENDIX A

A BRIEF HISTORY OF PAPERMAKING IN THE UNITED STATES

(Taken from several sources, the most prominent being 250 Years of Paper Making in America, published by the Lockwood Trade Journal Company, New York.)

The first paper mill was established in the United States in 1690 near Philadelphia. The mill made paper by hand, as all the mills in Europe did at that time and for some years after. A mill-man made about one and one-half reams of paper per day. The sheets were usually about 20 by 30 inches. The demand for paper was not very great, because the books used in the Colonies were all imported from Europe, and newspapers were only beginning to make an appearance.

Throughout this early period, there was a constant shortage of rags. This condition became more acute as the demand for paper began to increase in the Colonies. There are indications that these small early mills had difficulties in securing capital and skilled labor also. The equipment of the mills, i.e., the vats, moulds and presses were expensive, when they could be obtained. Much of the first equipment was handmade. As a result of these factors, the cost of production in these mills was high and paper was high priced. Paper prices varied between five and fourteen shillings per ream about 1730. Writing paper cost fourteen shillings per ream, while printing paper was about seven shillings per ream. Wrapping paper was the lowest priced at five shillings per ream. Rags cost one and a half to two pennies per pound.

During the latter half of the eighteenth century, conditions were highly unfavorable for the growth and development of the infant paper industry. The Revolutionary War and its repercussions were in action throughout this period. The prices of rags and paper reflected the unusual conditions. In 1787 the price of rags rose to twelve shillings per pound, while paper cost six pounds per ream. By 1783 paper was selling at eighty to one-hundred pounds per ream, a fantastic price. Much of this inflation was caused by the war and the issuance of large sums of colonial money. These prices did prove that a steady, slowly-rising demand promoted the growth of the paper industry. In 1800 there were about 100 paper mills in the country. By 1830 the figure had almost doubled. Most of these mills were small, both in size and output.

From the very beginning of paper manufacture in America, there was a constant search carried on for supplies of raw materials that could be used in making paper. Linen rags were first used in the Colonies, and when these became scarce cotton rags were substituted. Later, all types of fiberous substances were experimented with and found not suitable. Straw pulp was made for a time in the middle of the nineteenth century by one enterprising paper maker. The ideal substances has yet to be discovered. Although wood approaches the solution of the problem, it creates many different problems.

The first census of manufacturers taken in 1810 was a very crude report. Many paper mills were not listed, and others were duplicated. Since it is the only source available,

paper was formed. Through numerous presses, rolls and felts the sheet was carried to the dry end of the machine where it was wound on the rolls to be cut to size.

M. Roberts was unsuccessful in selling his machine in France, so he went to England and sold the patents to the Fourdrinier Brothers who were stationers in London. They built the machine and sold it. The machine came to be known as the Fourdrinier, named after these early manufacturers. In a short time, the machine was improved by John Gamble. Down to the present day, improvements are still being made on this machine. Many variations of it have been developed and put into profitable use. However, the basic principles of using the wire remains unchanged even today.

In 1809 another papermaking machine was invented by John Dickinson of London. This was a cylinder covered with a screen which revolved in a tub of pulp. By means of suction, the pulp was forced onto the screen and, after being lifted off, went on to become a sheet of paper. This was a most useful machine, but it failed to replace the Fourdrinier. Rather, it supplemented it because it was most useful in making heavy paper or paperboard. Today cylinder machines are widely used in the paper industry for this purpose.

In America, the Fourdrinier, Gamble and Dickinson patents became well known. The first Fourdrinier was introduced in America in 1827. The first Cylinder to be used in America was an invention of Joshua Gilpin who, in 1816, applied for his first patent. Other patents followed, and

in 1817 Gilpin introduced a cylinder machine in his mill. It was so successful that many other paper makers and inventors patented cylinder machines. John Ames of Springfield was among the first to successfully patent a cylinder machine. In 1829 the first American Fourdrinier was built and placed in operation, and soon the larger mills were equipped with this improved model. So it is that by 1848, when the paper industry first began in Holyoke, the necessary machinery for fast, efficient paper manufacture had been developed. For the next fifty years, the story of the paper industry in Holyoke is also the story of the industry throughout the United States.

Until the last decade of the nineteenth century, the Northeastern part of the United States was the paper center of the country. Water power was easily available, and in some cases very cheap (Holyoke, with its dams and canal system, was an excellent example). A plentiful amount of water for processing the paper was also a helpful feature. The major markets for paper were here in the East, and raw materials were easily obtainable. In the Northern section of New England, there was a plentiful supply of timber which was used when the wood pulp processes had been invented and developed. This leads us to another phase in the manufacture of paper in the United States.

During the decade 1890-1900, the paper industry in the United States grew apace. The invention of the Jordan machine in 1860, and its subsequent development and universal

acceptance by the close of the nineteenth century, helped increase the quality as well as the quantity of paper production. Other factors increasing the output of paper were: the use of wood pulp to cut costs, elimination of separate drying operations and increasing the speed of the paper machine.

As the industry grew, it required more and more capital for expansion purposes. The necessity for borrowing this capital brought financiers and brokers into contact with the industry more and more. The result was an attempt to create trusts and monopolies in the industry. This movement began in the paper industry in 1898 when the International Paper Company was formed. This concern had a capital of $55,000,000 and owned thirty-four mills in the Eastern section of the United States. It owned woodlands in Maine, New Hampshire, Vermont, New York and Ontario, Canada. This organization was equipped to manufacture, in quantity, any type of paper.

After the serious depression of the industry in the early Twenties, there were several new developments in the industry. The invention of the air-drier was of foremost importance. This machine helped speed up the production of paper by reducing the time and effort necessary to manufacture it and by introducing a new type of finish that became very popular. This finish is known as "Cockle," which was formerly only imparted to paper by loft-drying it. The air-drier imparted this "cockle" finish in much less time than it took to loft-dry paper. Cockle-finished paper became very popular in the fine paper field, and the old, smooth finish became more and

more obsolete. Today more fine papers must have a cockle finish to compete in the paper markets of the United States.

Another important development began in the middle of the decade 1920-1930 and continued for about fifteen years. This was the rapid expansion of paper manufacturing in the Pacific Northwest. For many years previous, this region had been noted for its lumber and logging operations. When wood pulp became universally used throughout the paper industry, sources of supply took on an added importance. The vast forests of this region were finally realized about 1925 when paper and pulp mills sprang up in the states of Washington and Oregon and across the border in British Columbia. The hemlock and spruce logs were ideal for news and book paper manufacture. In 1923 these mills produced 2,045 tons of pulp daily. In 1938 the production had increased to 7,638 tons per day.

This growth of the paper industry in the Pacific Northwest was another step in the development of the industry in this country. Originally, the Northeastern section of the country was the center of paper production. As the supply of wood decreased and the demand for certain types of paper changed, the center of paper and pulp production shifted to the Mid-Western states where the huge forests of Michigan, Illinois and Wisconsin were used to supply the ever-growing demand for wood pulp. This initial shift in paper and pulp production took place in the decades preceding and immediately following the turn of the century. By 1925 the second

shift was underway. This shift was described above. The demand for newsprint paper helped to bring about this demand for larger quantities of pulp. Since 1925 the expansion of pulp and paper facilities in this region has continued. Today this region is the center of newsprint paper and wood pulp of all kinds in the United States. The Mid-west is the center for fine book paper and contributes to the nation's supply of wood pulp.

The latest step in the growth pattern of the paper industry in the United States has been in a southernly direction. For many years a very small amount of paper was made in southern mills. In 1810 there were about twenty-five paper mills operating in southern states. These mills were all rag mills. In 1909 the process of making sulphate pulp was inaugurated in Roanoke Rapids, North Carolina. The vast pine forests of the South were the source of wood supply for these mills. The raw material was present, and it only remained for someone to come along and develop the region.

In 1932 this man arrived. Dr. Charles Holmes Herty, a chemist who for many years had been interested in industrial uses for the Southern pine forests, was one of the first to realize the many advantages of the South's wood supply. In numerous experiments, Dr. Herty and others proved that the Southern pine wood could be used to produce paper as well as many additional products, i.e., turpentine and textile fibers. Many tests were made, and in 1936 the Union Bag and Paper Company opened its first mill in Savannah, Georgia. Dr. Herty

is given credit by many authorities for "putting Southern pulp on the map."

The expansion and growth of the Southern paper industry has been nothing short of sensational. From 1936 to 1941 twenty-one companies set up mills and began making pulp and paper. Other advantages than a cheap and plentiful supply of pulpwood prompted this development. Manufacturing costs in the South are generally less than in other sections of the country, and many companies were quick to take advantage of them. Many fine ocean ports are also available for cheap shipping in the Southern States, and rail transportation is not a problem. The original mills also were constructed at savings of fifteen to twenty per cent, and wages were about twenty per cent lower than other sections of the country.

Most of these Southern paper mills are large modern mills. They have the latest machinery, noted for its speed and size. Cylinder and Fourdrinier machines with a width of 150 inches and 236 inches, respectively, are not uncommon in these mills. The most efficient use of papermaking processes is also evident. Many of the mills are integrated to the highest degree of efficiency. They own their own forests and water supplies and operate the mills as a unit, making the pulp and the paper as a continuous operation. It is estimated that the expansion of Southern papermaking in the years 1935 to 1940 accounted for most of the 1,000,000-ton increase in paper production in the country for this same period.

The manufacture of paper by mass production techniques

utilizes the lowest cost methods known to papermakers today. Authorities believe this type of paper production can be pursued on an unlimited scale in the South. Kraft paper and various kinds of paperboard are made extensively in the Southern mills. Recently, newsprint paper has been growing in total produced in the South. Kraft paper is used mostly for packaging and wrapping purposes. Newsprint paper is the type used in every daily newspaper throughout the country. It is always in great demand and has been since the rise of our great daily newspapers with their rapid automatic machinery in the closing decades of the nineteenth century. Today much of our newsprint pulp and paper comes from Canada.[1]

It would be a gross error to write about the many important developments which have come about in the paper industry in the United States since 1690 and omit a description of the important change of the paper industry from an art to a science. Until the invention of the Fourdrinier machine and its subsequent improvement and installation in the United States in 1827, all of the paper made in the world was made by hand. The process of making paper by hand was an art in every sense of the term. The vatman, the coucher and the layman all had to be experts who knew their work and performed it every bit as skillfully as a modern surgeon would operate upon the human brain. The early methods were crude and slow, but very effective. Even with the advent of the paper

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1. Canadian Reciprocity Act of 1913.

machine, much of the work done in the typical paper mill had to be performed by judgment and experience of the owner or his superintendent. The entire process from rags to pulp to paper was carefully watched and supervised and tested by the papermaker. The testing methods were crude and unscientific, but, because many variables were eliminated by the touch of experience, many tons of high quality paper were made by the nineteenth century papermakers. Most of this paper had the stamp of individuality to it. Each paper mill made its paper slightly different than every other one. There were no standard weights to paper, nor were the operations of beating, callendering or drying standardized as between mills. The papermakers relied upon their senses and their experience to judge when "half-stuff" had been beaten well enough to send it to the paper machine.

Late in the nineteenth century, various tests for determining different properties of paper came into use. The Perkins Machinery Company of Holyoke patented the Mullen tester, which is a device for testing the bursting strength of paper. Later the Elmendorf tester was invented and used successfully to test the tearing strength of paper. Next came the Schopper Folder. This machine was designed to test the paper for folding endurance. It gives an indication of the durability and permanence of the paper. Another folding tester is of more recent origin and is known as the M.I.T. Folder. It is a more sensitive instrument than the Schopper, but it performs the same operation.

One of the oldest tests performed on paper is called the Basis or Substance Weight Test. For this test a given number of sheets (500) of a standard size (17 x 22 inches) is weighed, and the result should be one of the standard results of 13, 16, 20, 24, 28, 32 or 36. Basis Weight as a test is very complicated, because of the many different kinds of paper and the variations in sizes which result. Indications as to surface finish and density of the paper can be gained by this test. There are many other tests performed on paper as it is being made, and more tests are added each year. Besides the few mentioned above, paper is subjected to the "pick" test (for coated papers), the smoothness test, the expansivity test, the tensile strength test and the thickness measurement test. All paper mills today have some or all of these tests constantly applied to whatever paper is being made. In the larger mills Technical Control Departments are set up to carry out many of these tests and to insure the stability of production as closely as is necessary.

The Departments in many of the paper mills, both large and small, are supplemented by extensive laboratories in which paper is tested microscopically, chemically, optically and empirically. These tests insure strength and length of fibres, constant ash content, a stable reading opacity and such finish qualities as ruling, writing, printing and erasing actions demand from paper. Several of these laboratories are equipped with miniature papermaking machinery, and many tests under simulated conditions are carried out. The American

Writing Paper Company of Holyoke has one of these extensive laboratories with accompanying machinery.

Through its individual members, the Technical Association of the Paper and Pulp Association, commonly referred to as T.A.P.P.A., has been foremost in establishing specifications for paper mills. Specification and standardization go hand-in-hand in papermaking. Once papermaking has been controlled so that accuracy and precision can be used to standardize the paper being made, then minimum and maximum measurements for the same paper or for different papers can be set up to comply with the use to which the paper must be put. The buyer and user of paper must necessarily work closely with the papermaker, as this is a job of coordinating the two. The coordinator is the technical man whose job it is to set up specifications. In this important job, and in many other jobs of great importance, the chemist and engineer have played a most important part. As one author summed up the work of this association:

> It is impossible to measure the dynamic effect of the work of its members. But there is no doubt that the present position of the paper industry has been due in no small measure to their work. Production rates have been increased, large volumes of raw materials have become available through the development of improved processes. Many new and unique applications of paper have broadened the markets and usefulness of the industry to the community.

It would be wrong to leave with the reader the impression that the machines practically run themselves in the modern paper mill. This is not true. The machine tenders and beatermen are still very important to the manufacture of paper. Their experience and skill are such that no machine can re-

place, and they will be a most important part of the paper-making industry for a long time to come. On the other hand, I have tried to leave with the reader the highlights of the history of how the artisan has been replaced in the paper industry by the scientist. That this has been beneficial to the industry is beyond doubt when one looks at the increased production, the flexibility of the modern paper mill and the increase in the sources of supply which have been brought about by these scientists. It is to be expected that this trend for research and development will be continued in the future on an increased scale, and new and finer methods and machinery will be making better paper in the future.

Throughout this history of the Paper Industry in the United States, there is one characteristic which readily associates itself with the industry. This is the fact that the paper industry in the United States in the past fifty years has been changing. It has been "dynamic," The shifts in types of raw materials used, in new methods and processes developed to make paper and the various many new uses to which paper is being put all bear witness to the dynamic nature of the industry. Through continued research and progressive management, this essential nature of the paper industry in the United States can be preserved in the future.

APPENDIX B

THE DEVELOPMENT OF WOOD PULP MANUFACTURE IN THE U.S.

(Taken from several sources, the most prominent being Modern Pulp and Papermaking by G. S. Witham, Reinhold Publishing Corp. of New York, 1952)

A brief discussion of the various inventions and discoveries in making paper pulp from wood is here given to introduce the reader to the background of this important phase in paper manufacturing history. The change from using rags exclusively as the source of cellulose fibers to that of using wood as the main source was brought about as a result of the processes described below.

In the order of their invention, the five methods of wood pulping used today are: mechanical grinding, the sulphite process, the soda process, the sulphate process, and there are various semi-chemical processes of minor importance. The mechanical grinding of wood produces a product known as ground wood pulp. This is the cheapest form of wood pulp. It is made by simply forcing the face of a log against large grinding stones. This pulp is used as a filler for some medium grade papers, and it is used extensively in making newsprint, wallpaper and building papers. Generally, ground wood pulp is used in making papers which are not expected to last a long time. In 1865, Albrecht Pagenstecher was the first man to import grinding machines into America from Germany. At first he had a difficult time convincing papermakers that his product could be used to make paper. Ground wood was found to be

satisfactory for making newsprint, and from that time on he had no difficulty selling his output. Fine papermakers were very skeptical of the ground wood, and even today very little of this type of pulp is used in making high grades of paper. In 1870 ground wood pulp sold for eight cents per pound. In subsequent years it dropped to four cents per pound and eventually reached one cent per pound when many mills were in operation and competition was keen. Newsprint prices were reflected in this drop by showing a decline from fourteen cents per pound in 1870 to two cents in 1899.

The next pulping process was the most important development in the paper industry since the invention of the Fourdrinier machine. In 1854 an Englishman named Hugh Burgess brought a chemical process of making wood pulp to the United States. The process was both commercially and chemically sound, but Burgess encountered the same prejudice that Pagenstecher was to encounter about ten years later. This chemical process was found useful in making many kinds of wood into pulp. This fact helped bring raw material costs down so that the process slowly became recognized as the best method available for utilizing wood as a cellulose fiber for making paper.

The American Wood Paper Co. in Pennsylvania was the first large mill to use the soda pulp process. This was in 1866. The Newton Brothers in Holyoke had a soda pulp mill operating in 1878. This was the first mill of its kind in Western Massachusetts. The process was very widespread, and many soda pulp mills had been established by 1880.

Many improvements have followed the original process. The original process was to use caustic soda to disintegrate the fibers of the wood so that the cellulose was left in a wholesome state. The process was faster and more efficient than the rag room type of pulp making. Also, the wood used was of a cheap variety which was plentiful. Poplar, aspen and spruce were the most frequently used woods. As the process became more common, many improvements helped bring about more efficient operations. Chemicals were improved, and engineers discovered ways of using the liquor over again. Each improvement tended to reduce the cost of operation of this process. The investigation of ways and means to improve the chemical process still continues in many research departments of paper and pulp mills throughout the country.

As the soda process gained in importance, paper men began experimenting to find other chemicals that would react on wood in a similar manner. Benjamin C. Tilghman tried to solve the shortage of rags by using sulphuric acid to break up the wood and form pulp. His experiment was a success, and he erected a pulp mill to make pulp by the sulphite process. In 1865 Tilghman patented his process, which consisted of digesting wood chips with an acid liquor (bisulphate of lime) at a high temperature and pressure. The liquor dissolves and removes all the constituents of the wood chips except the cellulose, which in its impure form is the unbleached sulphite pulp.

For about twenty years the production of pulp by this

process languished because of the difficulty of finding a suitable container for the sulphuric acid reaction. In 1885 Charles S. Wheelwright encountered the same problem when he attempted to make sulphite pulp. He persisted until the problem was solved, and the first sulphite mill was erected in Michigan in 1887. This was a triumph against endless difficulties for the many men involved.

The cost of making sulphite pulp is more than either mechanical or soda pulp. Only about fifty per cent of the raw material is recovered in the finished product by this method. Besides, more labor and power must be used to prepare the wood before it reaches the digesting process. Also, there is added expense in a large chemical plant for making the acid liquor. (This is not an added expense over the soda process because a chemical plant is necessary here also.) Lastly, there are large costs for machinery and upkeep with the sulphite process. Despite these cost drawbacks, the sulphite pulp is the most widely used of all pulp made. Reasons for this are: greater length and strength of fibers, greater pliability of fibers, and freedom from deterioration. Sulphite pulp is used to some degree in all but 100 per cent rag or pure groundwood papers today.

The sulphate process is the next most important chemical process to be discovered. It was a direct result of the many experiments with soda ash which took place around this time. Most of the pioneer research was carried on in Sweden and Germany. The idea was the same as the other chemical processes,

i.e., to find a cheap chemical which would dissolve or remove all the materials in the wood except the cellulose fibers.

A chemical engineer, C. H. Dahl, is credited with inventing the sulphate process. He used sodium sulphate and sulphide in liquor form to digest the wood chips. His process was a success and developed rapidly in Sweden where the term "kraft" was used to describe the product. This term means strength in Swedish and denotes the predominant characteristic of the paper made of sulphate pulp.

A drawback of this paper is the dull brown color which it has before bleaching. All of the color cannot be bleached out because the cost would be prohibitive. As a result, the paper is used in products where color is not an important factor. Its strength makes it ideal for wrapping and bag paper.

The first sulphate mill in the United States was built in 1909 at Roanoke Rapids, North Carolina, by the Roanoke Rapids Paper Manufacturing Company. Since this time, many new processes have been added to increase the efficiency and operation of this process. The increased use of this "kraft" type of paper has given impetus to the rise of sulphate industries of the South and the Pacific Coast. The Roanoke Company spearheaded this development by introducing Southern pine into the sulphate process. Much research is continually underway to improve the bleaching process for this process, and, in the future, it is reasonable to predict continued growth in this branch of the industry.

There are other chemical processes used to treat straw, esparto, bamboo and bagasse, but production of cheap papers would have been impossible, both in a physical and a financial sense, if a cheap useful form of pulp had not been discovered. The industry stepped into its seven league boots of progress when this bottleneck was broken.

Explanation of Rated Capacity:

Rated capacity is arrived at by measuring the output of the paper mill based on the speed of its machines and other plant variables for one 24-hour period. This result is then multiplied by a six-day week.

Rated capacity is figured out so rigidly it is very inaccurate. The reason for this is that ideal conditions, which are more or less assumed by the above method, just do not exist. In the above results, allowances for idleness, repairs and adjustments are not given consideration. By the same token, when paper is first put through the machine it will probably be faulty for the first hour or so of its run. These adjustments are included improperly in the rated capacity figure.

These facts help to explain the reason why the industry as a whole rarely runs at capacity. It is always operating in the neighborhood of eighty per cent of capacity. In order to top rated capacity a paper mill must operate six or seven days a week, running three shifts per day. This only occurs when demand is very great.

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Amherst, June 1, 1953

Approved:

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