

# MAINE STATE LEGISLATURE

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PUBLIC DOCUMENTS OF MAINE:

1904

BEING THE

ANNUAL REPORTS

OF THE VARIOUS

DEPARTMENTS AND INSTITUTIONS

For the Year 1903.

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VOLUME II.

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AUGUSTA  
KENNEBEC JOURNAL PRINT  
1904

SEVENTEENTH ANNUAL REPORT

OF THE

BUREAU

OF

INDUSTRIAL AND LABOR STATISTICS

FOR THE

STATE OF MAINE

1903.

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AUGUSTA  
KENNEBEC JOURNAL PRINT  
1904





STATE OF MAINE.

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OFFICE OF COMMISSIONER OF  
INDUSTRIAL AND LABOR STATISTICS,  
AUGUSTA, December 31, 1903.

*To His Excellency, John F. Hill, Governor of Maine:*

SIR: I have the honor to present the report of the Bureau of  
Industrial and Labor Statistics for 1903.

Very respectfully,

SAMUEL W. MATTHEWS,

*Commissioner.*



## INTRODUCTION.

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Maine possesses many natural resources which have, as yet, received but little attention, and their importance and extent of development are, therefore, comparatively unknown and unappreciated by the general public.

The work of the Bureau during the past year, has included in its scope some of these new and hitherto untried fields of investigation.

### MINERAL SPRINGS.

Nature has been very generous to the State of Maine in the distribution of mineral and medicinal springs. Our investigation finds 81 of these springs. The products of several of these are largely sold without the limits of the State and the gross amount received for Maine mineral waters is more than \$300,000. The descriptions of these natural fountains of health will be found of interest, and their possibilities as a source of wealth deserve consideration.

### MINERALS.

Maine's granite, lime and slate are recognized throughout the country for their extent and quality. Their development has attained proportions which make them most important elements in our prosperity and influence. These minerals have heretofore been the subjects of careful investigations by the Bureau. There are other minerals in the State, of limited extent so far as is now known, and their development has not attained important proportions. Whether or not they can ever become profitable for investment is now a problem which is receiving the attention of experts and scientists.

## APPLE CULTURE.

Apple culture in Maine is a large, important and growing industry. According to the United States census, the number of apple trees in the State in 1900 was 4,184,781, while in 1890 it was 3,003,109, an increase of 1,181,672, or 39.3 per cent in 10 years. The yield in 1899 was 1,421,773 bushels, while in 1889 it was 3,071,471 bushels. Comparisons between the crops of different years are of but little significance as the quantity produced in any year is determined largely by the character of the season. The high quality of Maine apples gives them a prominent position in the markets of the world and the demand for these apples for foreign as well as domestic consumption is constantly increasing.

Some interesting information and valuable practical suggestions may be found in the communications sent to the Bureau by prominent apple growers in the State and incorporated in the article published in this report.

## LABOR UNIONS.

In the report of the Bureau for 1902, was published the results of inquiries into the subject of organized labor in the State of Maine. That investigation brought out many interesting facts as to the extent, purposes, character and influence of these organizations.

The present report contains the latest information relating to the conditions and growth of labor unions, obtained mainly from the returns of their secretaries. A marked increase in the number of unions and membership has taken place during the past year. Among the inquiries made by the Bureau were those relating to hours of labor, daily wages, annual earnings of working men, trade disputes, strikes, etc., from which many interesting and important facts as to labor conditions in the State are obtained.

The legitimate province of this Bureau is statistical only, and economic conclusions to be derived from existing facts are left for others to deduce.

## THE DEVELOPMENT OF MILLINOCKET.

The illustrated description of this town in the wilds of Maine, reads more like romance than reality, and furnishes another example of what Maine might become were her water powers and other great natural resources developed to their full extent.

Four years ago last May, where is now a thriving town of about 3,000 inhabitants, provided with the privileges and conveniences found in well regulated cities, there was an almost unbroken wilderness. This wonderful change in so short a time is the work of enterprise, energy and capital applied to the development of natural resources, resulting in the investment of millions of dollars and the erection of one of the largest pulp and paper mills in the world.

Other features of the report are a compilation of returns of assessors of cities, towns and plantations, of factories, mills and shops for manufacturing purposes, enlarged, completed or in process of erection during the year 1903; a brief article relating to railroads in the State; cotton and woolen industries, and statistics from the United States Census covering all the manufacturing industries in Maine, and special and detailed statistics of the manufacture of lumber, pulp and paper.

The report of the Inspector of Factories, Workshops, Mines and Quarries is published in this report in accordance with the provisions of the law.

But few labor disturbances have taken place within the State during the year and these are enumerated and described in the returns of the secretaries of the labor unions. Labor has been in good demand and employment at fair wages the prevailing rule.

The commissioner renews the expression of his obligations for efficient services rendered him in the prosecution of his work by his able and faithful clerk, Major Charles J. House, and special agent, Francis Wiggin.

## THE COTTON INDUSTRY.

Complete returns from ten cotton mills were received at this office in 1897, ten in 1898, twelve in 1899, ten in 1900, eleven in 1901, and eleven in 1902. The same were tabulated and certain deductions drawn from the totals and averages shown. The present year, thirteen such returns have been received, eleven of which are identical with the eleven received last year. The following is the tabulation of the thirteen returns received for the fiscal year ending June 30, 1903:

## COTTON GOODS.

Consecutive number.	Capital invested.	Cost of material used.	Value of product.	Number of weeks in operation.	AVERAGE NUMBER HANDS EMPLOYED.				AVERAGE WEEKLY WAGES PAID.			Total wages paid.
					Total.	Men.	Women.	Children under 16 years.	Men.	Women.	Children under 16 years.	
1	\$900,000	\$890,639	\$1,586,101.52	1,600	800	740	60	\$7 20	\$5 46	\$3 86	\$521,684	
2	140,000	80,000	125,000.52	90	26	70	...	7 35	6 15	...	30,000	
3	4,836,981	2,828,393	4,037,614.52	3,331	1,210	1,920	201	7 76	6 34	3 23	1,157,543	
4	1,000,000	803,634	1,464,600.51	1,240	547	632	61	8 27	5 70	2 45	414,650	
5	500,000	143,000	250,000.52	302	155	126	21	8 05	5 90	2 42	94,332	
6	1,500,000	413,067	1,001,280.52	960	345	579	36	8 30	5 75	4 00	472,475	
7	798,500	409,882	732,600.50.7	336	337	311	88	9 00	6 25	...	265,721	
8	130,000	331,855	594,145.52	361	191	170	...	7 62	5 42	...	123,639	
9	1,200,000	915,055	1,708,125.52	1,778	714	1,060	4	6 72	6 71	3 30	687,696	
10	1,100,000	549,185	1,021,639.50.6	1,025	450	500	75	6 25	4 95	3 60	319,175	
11	1,600,000	368,164	544,373.52	635	209	422	4	7 27	5 60	2 50	202,385	
12	76,600	218,348	326,063.52	149	40	96	13	9 87	7 19	4 01	59,137	
13	100,000	92,111	111,700.52	48	16	32	...	8 75	6 14	.....	17,498	
	\$13,282,081	\$7,984,338	\$13,533,240	51.7	12,255	5,034	6,658	563	\$8 03	\$6 01	\$3 24	\$4,365,930

The totals and averages of the above table are as follows:

Capital invested.....	\$13,282,081
Cost of material used.....	\$7,984,338
Total wages paid.....	\$4,365,930
Value of product.....	\$13,553,240
Average time run in weeks.....	51.7
Total number of hands employed.....	12,255
men .....	5,034
women .....	6,658
children under 16 years.....	563
Average weekly wages of men.....	\$8.03
women .....	\$6.01
children .....	\$3.24

Comparisons are made of the results of the above figures with those obtained from similar tabulations in 1897, 1898, 1899, 1900, 1901 and 1902, and those given by the United States census reports of the cotton industry for the State in 1880 and 1890. The two main items entering into the production of cotton goods are raw material and labor. Outside of these are interest on capital invested, wear and tear of machinery, taxes and insurance, repairs of buildings, salaries, breakage and waste, profits, etc., which we lump together under the name of "margin." Taking the value of the product as a basis, the following table will show the percentages of the three items, raw material, wages and margin, at the dates indicated:

Year.	Raw Material.	Wages.	Margin.	Totals.
1880.....	55.0	22.0	23.0	100.0
1890.....	55.2	28.5	16.3	100.0
1897.....	57.9	33.1	9.0	100.0
1898.....	52.4	34.8	12.8	100.0
1899.....	51.8	36.6	11.6	100.0
1900.....	53.9	35.0	11.1	100.0
1901.....	57.1	33.5	9.4	100.0
1902.....	57.3	32.7	9.9	100.0
1903.....	58.9	32.2	8.9	100.0

Referring to the above table, it will be seen that the percentage of raw material entering into a given product, which reached its lowest point, 51.8, in 1899, has since constantly been increasing, and has reached 58.9. The percentage of wages, which had

shown a constant increase and reached its highest point, 36.6, in 1899, has constantly fallen off until this year it is at 32.2, although the average weekly rate has increased. The percentage of margin, which has shown considerable fluctuation, has reached its lowest point 8.9, the past year.

The following table will show the average annual product and the average annual earnings per employe, including men, women and children, for the years named:

Year.	Annual product per employe.	Annual earnings per employe.
1880 .....	\$1,132 70	\$249 73
1890 .....	1,084 61	312 50
1897 .....	873 89	289 50
1898 .....	777 98	270 91
1899 .....	818 34	300 00
1900 .....	914 57	319 62
1901 .....	959 69	321 11
1902 .....	1,025 85	336 10
1903 .....	1,105 94	358 26

The average annual product per employe shows a constant decrease between 1880 and 1898, the fall off amounting to \$354.72 during the eighteen years, but the past five years show an increase of \$327.96.

In average annual earnings per employe there was an increase from 1880 to 1890 of \$62.77, from 1890 to 1898 a decrease of \$41.59, and during the past five years an increase of \$85.35, a net increase since 1880 of \$106.53.

Eleven of the thirteen returns received this year are from the same mills from which the eleven returns were received in 1902, and fair comparisons can be made between the results of the tabulations of these two sets of returns for 1902 and 1903 as follows:

Capital invested, 1902.....	\$13,391,722
Capital invested, 1903.....	13,105,481
Decrease .....	\$286,241
Cost of material used, 1902.....	\$7,093,385
Cost of material used, 1903.....	7,673,874
Increase .....	\$580,489



Total wages paid, 1902 .....	\$4,057,111
Total wages paid, 1903 .....	4,289,300
Increase .....	<u>\$232,189</u>
Value of product, 1902 .....	\$12,383,041
Value of product, 1903 .....	13,114,877
Increase .....	<u>\$731,836</u>
Average weekly wages of men, 1902 .....	\$7.81
Average weekly wages of men, 1903 .....	8.01
Increase .....	<u>\$ .20</u>
Average weekly wages of women, 1902 .....	\$5.85
Average weekly wages of women, 1903 .....	5.99
Increase .....	<u>\$ .14</u>
Average weekly wages of children, 1902 .....	\$3.07
Average weekly wages of children, 1903 .....	3.22
Increase .....	<u>\$ .15</u>
Average number of men employed, 1902 .....	5,323
Average number of men employed, 1903 .....	4,978
Decrease .....	<u>345</u>
Average number of women employed, 1902 .....	6,224
Average number of women employed, 1903 .....	6,530
Increase .....	<u>306</u>
Average number of children employed, 1902 .....	524
Average number of children employed, 1903 .....	550
Increase .....	<u>26</u>
Average total number of employes, 1902 .....	12,071
Average total number of employes, 1903 .....	12,058
Decrease .....	<u>13</u>
Average number of weeks in operation, 1902 .....	51.0
Average number of weeks in operation, 1903 .....	51.7
Increase .....	<u>.7</u>

## THE WOOLEN INDUSTRY.

In 1902, returns from twenty-two woolen mills were tabulated, while this year twenty-six complete returns have been received. The following table will show the condition of the industry in these twenty-two mills for the year ending June 30, 1903, and furnish a basis from which comparisons are made with former years:

## WOOLEN GOODS.

Consecutive number.	Capital invested.	Cost of material used.	Value of product.	Number of weeks in operation.	AVERAGE NUMBER HANDS EMPLOYED.				AVERAGE WEEKLY WAGES PAID.			Total wages paid.
					Total.	Men.	Women.	Children under 16 years.	Men.	Women.	Children under 16 years.	
1	\$144,000	\$75,000	\$150,000	52	90	65	25	-	\$9 00	\$7 00	-	\$39,500
2	100,000	150,855	245,156	52	130	96	34	-	9 00	6 00	-	54,667
3	150,000	180,229	275,766	52	150	85	65	-	8 75	7 25	-	59,417
4	113,000	70,405	142,780	47	100	60	40	-	9 00	5 00	-	37,575
5	125,000	140,000	320,000	52	140	100	40	-	10 00	7 00	-	69,444
6	50,000	65,000	102,000	52	68	53	15	-	9 00	6 00	-	29,400
7	200,000	271,597	481,870	52	215	138	69	8	9 75	7 00	\$3 50	98,137
8	75,000	144,633	226,931	52	100	75	25	-	7 50	6 00	-	48,496
9	300,000	295,920	508,136	52	201	140	61	-	10 75	7 75	-	99,267
10	120,000	95,069	153,366	52	97	61	36	-	9 61	6 51	-	42,675
11	22,500	112,242	180,203	52	75	62	13	-	11 25	7 30	-	33,325
12	80,000	83,682	134,554	52	75	47	28	-	8 35	6 35	-	29,653
13	146,000	169,010	246,737	52	125	70	55	-	11 25	7 30	-	63,085
14	200,000	150,400	217,000	52	100	50	50	-	9 00	7 50	-	42,600
15	471,013	314,696	566,342	51	300	210	90	-	10 25	7 80	-	111,756
16	400,000	212,999	320,352	52	200	130	63	7	10 00	7 00	4 00	63,365
17	9,000	52,000	88,000	52	60	38	22	-	9 00	7 50	-	25,268
18	100,000	181,297	316,256	52	178	125	50	3	8 50	6 75	4 50	70,950
19	324,500	327,078	531,392	52	250	160	90	-	9 00	7 50	-	101,790
20	796,000	279,500	574,800	52	310	248	46	16	9 30	6 98	4 10	146,500
21	100,000	301,656	435,979	52	282	195	87	-	9 90	6 42	-	129,725
22	50,000	141,915	273,929	52	117	72	45	-	8 53	6 62	-	47,430
23	169,000	286,901	396,566	51	250	200	50	-	11 00	9 43	-	78,730
24	60,000	102,920	190,920	51	128	88	40	-	8 40	4 75	-	42,174
25	6,000	40,451	76,381	52	50	35	12	3	8 70	5 10	4 50	19,016
26	38,000	105,606	142,306	52	60	40	20	-	8 10	7 12	-	25,325
	\$4,349,013	\$4,351,061	\$7,297,722	51.7	8,851	2,643	1,171	37	\$9 27	\$6 98	\$4 02	\$1,609,270

The totals and averages of the above table are as follows :

Capital invested.....	\$4,349,013
Cost of material used.....	\$4,351,061
Total wages paid.....	\$1,609,270
Value of product.....	\$7,297,722
Average time run in weeks.....	51.7
Total number of hands employed.....	3,851
men.....	2,643
women.....	1,171
children under 16 years.....	37
Average weekly wages of men.....	\$9.27
women.....	\$6.98
children.....	\$4.02

Similar comparisons are made as in the cotton industry. On the basis of the value of the product, the following table shows the percentages of raw material, wages and margin at the different periods named :

Year.	Raw material.	Wages.	Margin.	Total.
1880.....	64.2	15.6	20.2	100.0
1890.....	65.9	21.7	12.4	100.0
1897.....	65.4	25.1	9.5	100.0
1898.....	60.1	23.4	16.5	100.0
1899.....	65.5	21.7	12.8	100.0
1900.....	55.9	21.9	22.2	100.0
1901.....	60.0	22.6	17.4	100.0
1902.....	61.9	22.4	15.7	100.0
1903.....	59.6	22.1	18.3	100.0

As compared with 1902, the percentage of raw material entering into the total product has decreased 2.3 per cent in 1903. The percentage of wages, which decreased 3.4 per cent from 1897 to 1899 and increased .9 of one per cent from 1899 to 1901, has decreased .5 of one per cent from 1901 to 1903. The percentage of margin has increased 2.6 per cent in 1903.

The average annual product and earnings per employe are shown in the following table for the periods named :

Year.	Annual product per employe.	Annual earnings per employe.
1880 .....	\$2,160 28	\$337 51
1890 .....	1,739 84	377 03
1897 .....	1,389 86	348 79
1898 .....	1,602 67	375 20
1899 .....	1,655 40	354 71
1900 .....	1,900 24	416 10
1901 .....	1,719 81	388 77
1902 .....	1,912 73	427 80
1903 .....	1,895 02	417 88

The average annual product per employe, which fell off \$770.42 between 1880 and 1897 and showed an increase of \$510.38 in the next three years, shows a net decrease of \$5.22 since 1900; while the average annual earnings per employe, including men, women and children, show a decrease from last year of \$9.92.

Twenty of the returns from woolen mills tabulated this year are from mills from which returns were received in 1902, while the other six are from mills from which no returns were received for that year, or if received, were too defective for use. The following comparisons are made between the business of the above mentioned twenty mills for 1902 and 1903:

Capital invested, 1902.....	\$3,380,064
Capital invested, 1903.....	3,926,013
Increase .....	\$545,949
Cost of material used, 1902.....	\$3,438,076
Cost of material used, 1903.....	3,371,612
Decrease .....	\$66,464
Total wages paid, 1902.....	\$1,238,494
Total wages paid, 1903.....	1,266,870
Increase .....	\$28,376
Value of product, 1902.....	\$5,539,181
Value of product, 1903.....	5,781,641
Increase .....	\$242,460

Average weekly wages of men, 1902.....	\$9.23
Average weekly wages of men, 1903.....	9.12
Decrease .....	<u>\$ .11</u>
Average weekly wages of women, 1902.....	\$6.85
Average weekly wages of women, 1903.....	7.03
Increase .....	<u>\$ .18</u>
Average weekly wages of children, 1902.....	\$3.94
Average weekly wages of children, 1903.....	3.97
Increase .....	<u>\$ .03</u>
Average number of men employed, 1902.....	1,958
Average number of men employed, 1903.....	2,013
Increase .....	<u>55</u>
Average number of women employed, 1902.....	895
Average number of women employed, 1903.....	917
Increase .....	<u>22</u>
Average number of children employed, 1902.....	39
Average number of children employed, 1903.....	34
Decrease .....	<u>5</u>
Average total number of employes, 1902.....	2,892
Average total number of employes, 1903.....	2,964
Increase .....	<u>72</u>
Average number of weeks in operation, 1902.....	51.9
Average number of weeks in operation, 1903.....	51.7
Decrease .....	<u>.2</u>

FACTORIES, MILLS AND SHOPS BUILT DURING 1903.

In response to the following inquiries: "How many and what kinds of factories, mills and shops for manufacturing purposes, have been enlarged, completed, or are in process of erection during 1903?" "Estimated cost of same?" "Probable number of hands they will employ?" answers have been returned by the officers of nearly every city, town and plantation in the State. Ninety-six cities, towns and plantations report building in this line as follows:

ANDROSCOGGIN COUNTY.

Towns.	Buildings.	What done.	Cost.	Help.
Lewiston .....	Cotton storehouse .....	Built new .....	\$50,000	-
Lewiston .....	Cotton machine shop .....	Built new .....	9,000	-
Lewiston .....	Planing mill .....	Built new .....	2,000	10
Wales .....	Brick shop .....	Built new .....	200	15

AROOSTOOK COUNTY.

Cary Pl .....	Saw mill .....	Completed .....	5,000	12
Cyr Pl .....	Steam lumber mill .....	Built new .....	7,500	30
Eagle Lake Pl .....	Saw mill .....	Enlarged .....	400	-
Eagle Lake Pl .....	Lumber mill .....	Built new .....	100,000	100
Fort Fairfield .....	Starch mill .....	Built new .....	8,000	-
Grand Isle .....	Grist mill .....	Built new .....	500	3
Hersey .....	Lumber mill .....	Built new .....	2,000	6
Hodgdon .....	Lumber mill .....	Built new .....	1,000	5
Houlton .....	Planing and moulding mill. }	Built new .....	14,000	30
Houlton .....	Two saw mills .....	Built new .....	-	-
Island Falls .....	Axe factory .....	Built new .....	600	3
Mapleton .....	Saw mill .....	Built new .....	3,000	8
New Limerick .....	Sole leather tannery .....	Built new .....	18,000	60
New Limerick .....	Starch dry house .....	Built new .....	1,000	-
Perham .....	Starch factory .....	Built new .....	-	-
Perham .....	Saw mill .....	Built new .....	-	-
Reed Pl .....	Lumber mill .....	Enlarged .....	1,500	20
St. Francis Pl .....	Blacksmith shop .....	Built new .....	200	1
St. John Pl .....	Saw mill .....	Enlarged .....	500	5
Stockholm Pl .....	Veneer mill .....	Built new .....	1,000	-
Van Buren .....	Lumber mill .....	Built new .....	200,000	300
Van Buren .....	Lumber mill .....	Built new .....	50,000	60
Wallagrass Pl .....	Saw mill .....	Built new .....	2,000	6
Washburn .....	Starch factory .....	Built new .....	4,000	10
Westfield Pl .....	Starch factory .....	Built new .....	3,000	10

CUMBERLAND COUNTY.

Portland .....	Screen factory .....	Additions .....	50,000	50
Standish .....	Steam mill .....	Built new .....	1,500	5
Westbrook .....	Paper mill .....	Enlarged .....	50,000	} 200
Westbrook .....	Cotton warp mill .....	Enlarged .....	65,000	
Yarmouth .....	Paper mill .....	Rebuilt .....	150,000	-

## FRANKLIN COUNTY.

Towns.	Buildings.	What done.	Cost.	Help.
Farmington .. .. .	Carriage shop.....	Built new....	\$1,200	3
Farmington .. . . .	Lumber mill.....	Built new....	1,500	5
Jay .. . . .	Sash and door mill.....	Enlarged . . .	500	4
Phillips.....	Lumber mill.....	Built new....	10,000	75
Phillips .. . . .	Novelty mill.....	Built new....	2,000	3
Wilton .. . . .	Woolen mill.....	Enlarged....	25,000	50

## HANCOCK COUNTY.

Amherst .. . . .	Steam saw mill.....	Built new....	2,500	8
Aurora .. . . .	Saw mill.....	Enlarged.....	500	3
Bluehill .. . . .	Mineral water bottling house.	Built new....	3,000	5
Ellsworth .. . . .	Hard wood factory.....	Reconstruct'd	8,000	50
Franklin.....	Grist mill.....	Built new....	2,500	2
Gouldsboro .. . . .	Clam canning factory.....	Built new....	1,200	25
Orland .. . . .	Saw mill.....	Built new....	1,000	8
Tremont .. . . .	Sardine factory.....	Enlarged.....	20,000	100
Tremont .. . . .	Steam saw mill.....	Built new....	2,500	25

## KENNEBEC COUNTY.

Monmouth .. . . .	Woolen mill.....	Enlarged.....	1,300	-
Oakland .. . . .	Edge tool factory.....	Enlarged.....	-	30
Readfield .. . . .	Jewelry factory.....	Enlarged.....	275	2
Rome .. . . .	Barrel factory.....	Built new....	300	3
Sidney .. . . .	Grist mill.....	Built new....	1,000	1

## KNOX COUNTY.

Camden .. . . .	Woolen mill.....	Enlarged.....	12,000	20
South Thomaston .. . . .	Stone scouring shop.....	Built new....	500	6
Thomaston .. . . .	Steam saw mill.....	Built new....	1,000	3
Vinalhaven .. . . .	Glue factory.....	Built new....	10,000	10
Washington .. . . .	Wheelwright shop.....	Built new....	250	3

## LINCOLN COUNTY.

Damariscotta .. . . .	Portable saw mill.....	Built new....	600	8
Nobleboro .. . . .	Saw mill.....	Built new....	1,000	15
Waldoboro .. . . .	Cabinet mill.....	Built new....	1,500	6

## OXFORD COUNTY.

Bethel .. . . .	Machine repair shop.....	Built new....	1,500	6
Denmark .. . . .	Short lumber mill.....	Built new....	2,000	5
Dixfield.....	Spool mill.....	Built new....	15,000	40
Greenwood .. . . .	Two saw mills.....	Built new....	1,500	10
Norway .. . . .	Custom shoe shop.....	Enlarged.....	2,000	25
Norway.....	Woodworking mill.....	Built new....	3,000	10
Paris.....	Linen fiber mill.....	Built new....	10,000	25
Paris .. . . .	Novelty mill.....	Rented.....	-	35
Paris .. . . .	Woodworking mill.....	Enlarged.....	5,000	20
Stoneham .. . . .	Lumber mill.....	Enlarged.....	800	6

## PENOBSCOT COUNTY.

Towns.	Buildings.	What done.	Cost.	Help.
Bangor	Skirt manufactory	Rented	-	8
Brewer	Brick mill	Built new	\$5,000	-
Burlington	Woodworking mill	Enlarged	500	-
Corinna	Woolen mill	Built new	15,000	40
Dixmont	Lumber mill	Improved	2,000	8
Drew Pl	Lumber mill	Built new	30,000	100
Garland	Saw mill	Built new	800	3
Garland	Planing mill	Built new	1,000	2
Hampden	Lumber mill	Improved	1,500	20
Hampden	Grist mill	Improved	600	4
Hampden	Woodworking shop	Improved	800	2
Lincoln	Pulp mill	Enlarged	20,000	30
Lincoln	Lumber mill	Enlarged	-	-
Newport	Condensed milk factory	Enlarged	3,500	35
Newport	Woolen mill	Enlarged	4,000	50
Old Town	Lumber mill	Built new	15,000	20
Winn	Wheelwright shop	Enlarged	300	-

## PISCATAQUIS COUNTY.

Wellington	Short lumber mill	Improved	75	-
Wellington	Saw mill	Enlarged	300	-

## SOMERSET COUNTY.

Athens	Short lumber mill	Improved	600	5
Concord	Lumber mill	Built new	3,500	12
Dead River Pl	Railroad sleeper mill	Built new	1,000	6
Fairfield	Clothing Manufactory	Enlarged	500	12
Pittsfield	Woolen mill	Power house	30,000	-
Pleasant Ridge Pl	Spool bar mill	Built new	1,000	10
Pleasant Ridge Pl	Saw mill	Built new	500	5
Skowhegan	Worsted mill	Enlarged	28,000	100

## WALDO COUNTY.

Belfast	Foundry and machine shop	Built new	1,000	25
Brooks	Corn canning factory	Built new	-	3
Brooks	Creamery	Built new	-	20
Monroe	Shingle machine	Added	300	3
Morrill	Saw mill	Rebuilt	500	-
Stockton Springs	Saw mill	Built new	1,000	2

## WASHINGTON COUNTY.

Addison	Canning factory	Built new	1,500	40
Baring	Pulp wood mill	Built new	8,000	25
Calais	Shoe factory	Enlarged	1,200	-
Columbia Falls	Blueberry canning factory	Rebuilt	1,000	20
Columbia Falls	Saw mill	Enlarged	100	3
Cooper	Lumber mill	Built new	3,000	10
Edmunds	Lumber mill	Built new	10,000	25
Lubec	Three sardine factories	Enlarged	12,000	450
Machias	Lumber mill	Completed	15,000	20
Machias	Wooden box mill	Remodeled	1,000	6
Machiasport	Sardine factory	Built new	10,000	150

## YORK COUNTY.

Biddeford	Machine shop	Enlarged	200,000	400
Kennebunk	Strawmatting shop	Added	6,000	-
Waterboro	Clapboard mill	Built new	2,000	6
York	Brickmaking plant	Built new	50,000	50



## RECAPITULATION.

Counties.	Number of towns.	Number of buildings.	Total cost.	Hands employed.
Androscoggin . . . . .	2	4	\$61,200	25
Aroostook . . . . .	20	26	418,200	669
Cumberland . . . . .	4	5	316,500	255
Franklin . . . . .	4	6	40,200	140
Hancock . . . . .	8	9	41,200	226
Kennebec . . . . .	5	5	2,875	36
Knox . . . . .	5	5	23,750	42
Lincoln . . . . .	3	3	3,100	29
Oxford . . . . .	7	11	40,800	182
Penobscot . . . . .	12	17	100,000	322
Piscataquis . . . . .	1	2	375	-
Sagadahoc . . . . .	-	-	-	-
Somerset . . . . .	7	8	65,100	150
Waldo . . . . .	5	6	2,800	62
Washington . . . . .	9	13	62,800	749
York . . . . .	4	4	258,000	456
Total . . . . .	96	124	\$1,436,900	3,343

## TOTALS FOR THIRTEEN YEARS.

Years.	Number of towns.	Number of buildings.	Total cost.	Hands employed.
1891 . . . . .	86	110	\$3,023,850	4,278
1892 . . . . .	89	114	2,128,000	4,312
1893 . . . . .	81	108	841,725	2,526
1894 . . . . .	48	55	663,700	1,039
1895 . . . . .	75	102	1,367,800	2,797
1896 . . . . .	62	77	1,055,900	1,470
1897 . . . . .	74	95	827,600	2,339
1898 . . . . .	64	72	675,100	2,024
1899 . . . . .	103	138	6,800,700	4,990
1900 . . . . .	114	167	2,174,825	5,539
1901 . . . . .	94	121	5,638,200	6,337
1902 . . . . .	91	129	2,776,930	5,017
1903 . . . . .	96	124	1,436,900	3,343

## TRADE UNIONS.

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### INTRODUCTORY REMARKS.

In the report of the Bureau of Industrial and Labor Statistics for 1902 appears the first article on trade unions in Maine that has ever emanated from this department. As no public list of such unions then existed it was somewhat difficult to ascertain their location and consequently many were missed, while from many others only very meager returns or information were received.

From the complete returns received that year from the secretaries of the different unions, full and accurate information was compiled in regard to hours of labor, daily wages, etc., of the workmen employed in the different trades throughout the State. Much other information was obtained as a result of the investigation, so that the actual condition of the laboring men was much better understood by a perusal of the report. The article, although not so full and complete as desired, gave great satisfaction not only to organized labor but to the employers of labor as well, and to our citizens generally.

In this second investigation, made partly at the suggestion of members of labor organizations, our aim has been to obtain a more complete list of labor unions than we were able to present in 1902, including those formed during the past year, to extend our inquiries so as to obtain the average yearly earnings of employes in the various trades and callings here represented, and to make as far as possible full and correct statements in regard to any difficulties arising within the year between employers and employes.

A blank containing quotations from the act to provide a bureau of industrial and labor statistics, an explanation of the object of the investigation, and the following questions, was sent to the secretary of each local union:

1. Name of town or city.
2. Name of union.
3. Date of organization.
4. Number of members.
5. Qualifications for membership.
6. Initiation fee.
7. Monthly dues.
8. Times of meeting.
9. Benefits, insurance, etc.
10. Number of hours of labor daily.
11. Minimum daily wages.
12. Average number of days lost per individual during the year.
13. Average number of days worked per individual during the year.
14. Total average amount of wages per individual during the year.
15. What have you accomplished for labor by organization?
16. Has your union been involved in any labor agitation with employers during the year as to rates of wages, hours of labor, etc., not resulting in a strike or lockout? . . . . . Nature of dispute and how settled.
17. Has your union been involved in any strike or lockout during the year? . . . . . If so give history and results.

In compiling the information gathered, we have given in detail the statements contained in the answers to the first eleven questions on the blank for each union reporting, to which is added an item giving the location of the different central labor unions and one trade council, and for convenience of reference have arranged the unions alphabetically by towns.

The matter contained in the replies to questions 12, 13 and 14, relating to time lost, time worked and annual earnings, has been arranged by trades and occupations. The statements therein contained have been carefully verified and the various totals, comparisons and averages deduced will be of interest and value to every student of the labor question.

The replies to the 15th question, in regard to what had been accomplished by organization, differed so slightly that we have been able to condense them in a few brief lines.

We find by this compilation that there are in Maine 60 different classes of trade unions, that is, the workmen in 60 different trades and occupations are, to a greater or less extent, organized, while some are much more thoroughly organized than others.

In the building trades the carpenters have 12 unions, the masons 11, mason tenders 4, lathers 1, roofers 1, plumbers 5 and painters 10, a total of 44.

Among cotton mill workers the carders have 1 union, the mule-spinners 2, weavers 1, slashertenders 1 and loomfixers 2, a total of 7.

Among clothing makers the garment workers, journeymen tailors and suspender workers have 1 union each, a total of 3.

In the granite workers' trades the quarrymen have 5 unions, the granite cutters 14 and the paving cutters 1, a total of 20.

Among the iron workers the blacksmiths have 1 union, the sheet metal workers 1, foundry workers 1, iron moulders 5, stove mounters 1 and machinists 4, a total of 13.

There are 2 laborers' protective unions and 5 federal labor unions, a total of 7.

Among the printers there are 5 typographical unions and 1 pressmen's union, a total of 6.

Among the pulp and papermill employes the pulp, sulphite and papermill workers have 3 unions, the papermakers 5, paper bag mill workers 1 and paper bag machine tenders 1, a total of 11.

Among railroad men the conductors have 2 unions, the engineers 4, firemen 4, trainmen 5, telegraphers 1, car inspectors 1, freight handlers 1, car workers 1 and the electric railway men 1, a total of 20.

Among those connected with shipping the ship carpenters and joiners have 1 union, the boiler makers and iron shipbuilders 1, sailmakers 2, riggers 1, longshoremen 2 and seamen 2, a total of 9.

Of those who have to do with stationary engines the engineers have 1 union and the firemen 4, a total of 5.

Among those who drive public teams and carriages the team drivers have 4 unions and the cab drivers 1, a total of 5.

Of the workers in wood the sawmill employes have 2 unions, the millwrights and wood workers 1, and the millmen, carpenters and joiners 1, a total of 5.

Among such as we have classed as miscellaneous trades the bakers have 1 union, the barbers 4, boot and shoemakers 4, cigar makers 5, electrical workers 1 and retail clerks 4, a total of 19.

The above schedule foots up 174 unions located in 35 towns. In order to indicate their location and numerical strength we show, by one arrangement, the list of towns where each of the separate classes of unions exist, and, by another, the number of unions and their membership in each of the several towns.

Under the head of comparative growth of unions we have made a comparison of the results of our work for the years 1902 and 1903, and the showing must be most gratifying to those interested in union labor.

In the matter of strikes and other differences between employers and unions we find 27 cases of disturbance noted within the year, the sawmill employes' strike mentioned having occurred in the fall of 1902, only 6 of which resulted in strikes. In 2 cases non-union help was employed in place of the strikers, in 1 case the strikers returned to work leaving the matter in dispute to be settled in the future, in 1 case they returned to work where the result of the settlement has not been made public, in 1 case a compromise was made by mutual consent, and in the other case the matter was investigated by a committee agreed upon by both parties to the dispute and their recommendations adopted. In the 2 latter cases the results were partial successes very favorable to the unions, while in the other 4 they were either wholly or practically failures. The strikes were all of brief duration.

In the other 21 cases the disturbances were slight, consisting mostly of minor requests by the unions for advance in wages or shorter hours, in the great majority of which the requests were granted.

In the present investigation many personal interviews with the officers and members of the various unions have been had by the special agent of the Bureau, and in all cases he was treated with the utmost courtesy, his questions were freely answered and all information possible was given without reserve.

With but few exceptions the secretaries of the different unions filled out and returned the blanks with promptness, and there seemed to be a general desire to aid in every way possible in making a full and valuable report. In only one instance in the State was there a refusal on the part of a secretary to furnish the

desired information, and this amounted to nothing as the information was readily obtained from other sources.

The obligations of the Bureau are especially due to the secretaries of the central labor unions of Portland, Bangor, Augusta, and Lewiston for valuable assistance so freely rendered.

The perfectly frank and courteous manner displayed by officers and members of the several unions towards the agent of the Bureau speaks well for the intelligence of organized labor in Maine, and shows that the various unions have nothing whatever in their principles or acts that they are unwilling for the public to know. We believe that this investigation will prove of great value to all concerned, and that, as a result, there will be a better understanding between employer and employe, to the advantage of both.

LIST OF LABOR UNIONS IN MAINE, WITH ESSENTIAL FACTS PERTAINING TO THEM.

*Auburn.*

Boot and Shoemakers' Union. Number of members, 190; initiation fee, \$1.00; monthly dues, \$1.00; times of meeting, every Wednesday; sick benefit, \$5.00 per week; strike benefit, \$4.00 per week; death benefit, \$50.00 and \$100 according to length of membership; hours of labor, 10; minimum daily wages, \$1.50.

*Augusta.*

Augusta Federal Union, No. 11,434. Date of organization, September 21, 1903; number of members, 45; qualifications for membership, any working man not eligible to membership in any labor organization already formed within the territorial jurisdiction of the union; initiation fee, \$1.00; monthly dues, 35 cents; times of meeting, twice a month; benefits, none; hours of labor, 9; minimum daily wages, \$1.75.

Augusta Typographical Union, No. 380. Date of organization, October 5, 1902; number of members, 57; qualifications for membership, four years' apprenticeship; initiation fee, \$2.00; monthly dues, 50 cents; times of meeting, first Saturday in each month; funeral benefit, \$65.00; hours of labor, 54 per week; minimum wages, \$10.00 per week.

Scale of prices adopted February 1, 1903. Nine hours a day for six days to constitute a week's work, for which the following minimum prices are to be paid: assistant foremen or second hands, \$14.00 per week; compositors on job work, \$12.00 per week or 25 cents per thousand; pressmen, \$12.00 per week; feeders, \$10.00 per week; compositors on book work, \$12.00 per week or 25 cents per thousand; machine operators, day work, \$10.00 per week, night work, \$14.00 per week; linotype machine tenders, day work, \$10.00 per week, night work, \$12.00 per week. Overtime to be paid for at the rate of price and one-half.

Bricklayers, Masons and Plasterers' Union, No. 9. Date of organization, September 29, 1899; number of members, 42; qualifications for membership, must be a practical mechanic; initiation fee, \$10.00; monthly dues, 35 cents; times of meeting, every Friday evening; death benefit, assessment of 50 cents per member; hours of labor, 8; minimum daily wages, \$3.00.

Cab Drivers' Union, No. 559. Date of organization, December 26, 1902; number of members, 37; qualifications for membership, must be 18 years of age and of good moral character, must employ no help; initiation fee, \$1.25; monthly dues, 50 cents; times of meeting, Friday, once in two weeks; no regular hours of labor.

Carders' Union, No. 334. Date of organization, April 18, 1902; number of members, 80; qualifications for membership, must be 16 years of age and a worker in the mill; initiation fee, 50 cents; monthly dues, 50 cents; times of meeting, every other Friday; hours of labor, 10 hours and 50 minutes, first five days, 5 hours and 50 minutes, Saturdays; minimum daily wages, 82 cents.

Carpenters and Joiners' Union, No. 914. Date of organization, October 2, 1901; number of members, 116; qualifications for membership, must be not less than 21 nor more than 50 years of age, a journeyman carpenter, joiner or other woodworker, of good moral character and competent to command standard wages; initiation fee, \$5.00; monthly dues, 50 cents; times of meeting, every alternate Monday night; funeral benefit, \$50.00 to \$200 on death of a member, and \$25.00 to \$50.00 on death of a member's wife; disability benefit, \$100 to \$400; sick benefit, arranged by local union; hours of labor, 9; minimum daily wages, \$2.25.

Journeyman Barbers' International Union of America, Local No. 493. Date of organization, February 12, 1903; number of members, 34; initiation fee, \$2.00; monthly dues, 60 cents; times of meeting, second and fourth Thursday in each month; sick and accident benefit, \$5.00 per week; death benefit, \$60.00; hours of labor, average, 12; minimum wages, average, \$10.00 per week.

Loomfixers' Union, No. 330. Date of organization, April 8, 1902; number of members, 27; initiation fee, \$2.00; monthly dues, 50 cents; times of meeting, twice a month; hours of labor, 10 hours and 45 minutes; minimum daily wages, \$2.00.

Masons' Tenders' Union, No. 9,296. Date of organization, August 1, 1901; number of members, 20; qualifications for membership, must be of good moral character; initiation fee, \$5.00; monthly dues, 35 cents; times of meeting, every second Wednesday; hours of labor, 8; minimum daily wages, \$1.75.

Mule Spinners' Union. Date of organization, August, 1889; number of members, 40; qualifications for membership, must be a spinner; monthly dues, \$1.00; times of meeting, alternate Mondays; strike or lockout benefit, \$4.00 to \$6.00 a week; hours of labor, 10; minimum daily wages, \$2.25.

Painters, Decorators and Paperhangers' Union, No. 554. Date of organization, February, 1902; number of members, 36; initiation fee, \$5.00; monthly dues, 35 cents; times of meeting, first and third Tuesday in each month; death benefit, \$50.00; hours of labor, 9; minimum daily wages, \$2.50.

Pulp, Sulphite and Papermill Workers' Union, No. 35. Date of organization, March 15, 1903; number of members, 54; initiation fee, \$1.00; monthly dues, 35 cents; times of meeting, every other Sunday evening; hours of labor, 10 by day, 12 by night; daily wages, \$1.50 to \$3.50.

Retail Clerks' Protective Association, No. 819. Number of members, 106; qualifications for membership, must be 18 years of age and must have been one year a clerk; death benefit, \$100; hours of labor, 10; no minimum wages.

Suspender Workers' Union, No. 11,095. Date of organization, May 8, 1903; number of members, 8; initiation fee, \$1.50; monthly dues, 50 cents; time of meeting, first Tuesday in each month; hours of labor, 9; minimum daily wages, \$1.75.

Weavers' Union, No. 347. Date of organization, May 21, 1902; number of members, 100; qualifications for membership,



any weaver; initiation fee, 25 cents; dues, 10 cents per week; times of meeting, twice a month; accident benefit, \$3.00 per week; hours of labor, 10.

*Bangor.*

Amalgamated Association of Sheet Metal Workers, No. 34. Date of organization, September, 1901; number of members, 18; initiation fee, \$5.00; monthly dues, 50 cents; hours of labor, 9; minimum daily wages, \$1.75; maximum daily wages, \$2.25.

Bangor Branch, Atlantic Coast Seamen's Union. Date of organization, May, 1900; the membership for the whole coast is 4,366 in good standing; qualifications for membership, must be a practical seaman; initiation fee, \$5.00; monthly dues, 70 cents; times of meeting, every Monday night; burial, shipwreck, disablement and sick benefits; no regular hours of labor; minimum wages, \$25.00, \$30.00 and \$35.00 per month, according to tonnage.

The secretary adds: "Our effort since organizing has been more on the line of endeavoring to have some of our antiquated laws relative to seamen amended, rather than endeavoring to increase wages. In this we have been successful to a certain extent, as the act of 1895 and the act of 1898 will testify. Our aim now is to have enacted an efficiency bill, that is, to require all men sailing as seamen to be efficient men, examined by a board of inspectors. We also are working for a manning scale, requiring vessels to carry a sufficient number of men. We also want a larger fore-castle space for men."

Bangor Division, Order of Railway Conductors, No. 403. Date of organization, April 9, 1900; number of members, 55; initiation fee, \$5.00; yearly dues, \$2.00; times of meeting, second Sunday in each month; benefits, regulated by lodge; insurance benefit, \$1,000, \$2,000 and \$3,000, with dues according to amount of insurance taken.

Bangor Typographical Union, No. 446. Date of organization, September 8, 1901; number of members, 40; qualifications for membership, must be a competent printer or pressman who has served a four years' apprenticeship; initiation fee, \$5.00; monthly dues, 55 cents; times of meeting, first Saturday in each month; death benefit, \$65.00; hours of labor, 9 by day, 8 by

night; minimum weekly wages, day work, \$12.00, night work, \$15.00.

Barbers' Union, No. 211. Date of organization, October 21, 1901; number of members, 43; qualifications for membership, must have served an apprenticeship of three years; initiation fee, \$2.00; monthly dues, 60 cents; times of meeting, second and fourth Mondays in each month; sick benefit, \$5.00 per week; hours of labor, 11; minimum wages, \$11.50 per week.

Bricklayers, Plasterers and Masons' Union, No. 7. Date of organization, April 1, 1899; number of members, 90; initiation fee, \$10.00; monthly dues, 35 cents for 8 months, 25 cents for 4 months; times of meeting, every Friday evening; benefits, at discretion of the union; hours of labor, 9; minimum daily wages, \$3.33.

Brotherhood of Locomotive Engineers, No. 503. Number of members, 100; qualifications for membership, one year's work; initiation fee, \$10.00; insurance benefits, \$750, \$1,500, \$3,000 and \$4,500, with dues according to amount of insurance taken; minimum daily wages, \$3.50.

Brotherhood of Locomotive Firemen, No. 514. Number of members, 75; initiation fee, \$2.00; sick and death benefits and insurance; hours of labor, overtime after 11½ hours; daily wages, firemen, \$2.00, shifters and round house men, \$1.50.

Brotherhood of Railroad Trainmen, No. 443. Number of members, 100; qualifications for membership, 1 year in railroad service; initiation fee, \$1.00; monthly dues, \$1.75, \$2.25 or \$2.75, according to amount of insurance taken; times of meeting, first and third Sundays in each month; insurance benefit, \$500, \$1,000 or \$1,350 at disability or death; hours of labor, 11; minimum daily wages, switchmen, \$1.75, brakemen, \$2.20, conductors, \$3.10.

Building Laborers' Protective Union, No. 1. Date of organization, August 1, 1901; number of members, 112; qualifications for membership, a masons' helper in all masons' work; initiation fee, \$5.00; monthly dues, 25 cents; times of meeting, every Saturday; death benefit, \$50.00; accident benefit, \$5.00 per week; hours of labor, 9; minimum daily wages, \$2.10.

Carpenters and Joiners' Union, No. 621. Date of organization, June 11, 1900; number of members, 264; qualifications for membership, must be a journeyman carpenter, joiner or wood

worker of some kind, competent to command average wages, must be 18 years of age or over; initiation fee, \$10.00; monthly dues, 50 cents; times of meeting, every Thursday evening; death benefit, \$200; wife's funeral benefit, \$50.00; hours of labor, 9; minimum daily wages, \$2.25.

Cigarmakers' Union, No. 179. Date of organization, October 14, 1884; number of members, 48; qualifications for membership, apprenticeship of 3 years and free from disease; initiation fee, \$3.00; weekly dues, 30 cents; times of meeting, monthly; sick, death, out of work, traveling and strike benefits, amounts not stated; hours of labor, 8; minimum daily wages, all piece work.

Federal Labor Union, No. 9,646. Date of organization, March 3, 1902; number of members, 150; qualifications for membership, must be 18 years of age and of good moral character; initiation fee, \$2.25; monthly dues, 25 cents; times of meeting, second and fourth Thursdays in each month; benefits by subscription; hours of labor, 9; minimum daily wages, \$1.75.

There are about 20 union granite cutters in Bangor who hold meetings monthly, but they have no local organization.

International Brotherhood of Electrical Workers, No. 349. Date of organization, January 28, 1903; number of members, 12; qualifications for membership, must be able to pass an examination; initiation fee, \$10.00; monthly dues, 65 cents; times of meeting, every Wednesday evening; funeral benefit, \$100; hours of labor, 9; minimum daily wages, \$2.00, helpers, \$1.00.

Iron Moulders' Union, No. 101. Date of organization, 1859; number of members, 37; initiation fee, \$5.00; monthly dues, 25 cents; times of meeting, first and third Wednesdays in each month; hours of labor, 9; minimum daily wages, \$3.00.

Journeyman Plumbers, Gasfitters and Steamfitters' Union, No. 209. Date of organization, July 14, 1900; number of members, 30; initiation fee, \$15.00; monthly dues, 80 cents; times of meeting, every Monday night; hours of labor, 9; daily wages, \$3.00.

Journeyman Tailors' Union, No. 336. Number of members, 20.

Local Union of Shoemakers, No. 304. Date of organization, April 8, 1900; number of members, 50; initiation fee, \$1.00; monthly dues, \$1.00; sick benefit, \$5.00 per week for 13 weeks;

death benefit, \$50.00 and \$100, according to length of membership; hours of labor, 10.

Longshoremen's Union, No. 515. Date of organization, July 2, 1903; number of members, 138; qualifications for membership, must be 18 years of age, and a resident of Bangor for 3 months next preceding application; initiation fee, \$1.00; monthly dues, 50 cents for 8 months; times of meeting, second and fourth Mondays in each month; hours of labor, 10 except Saturday, 9 Saturday; wages, not definitely fixed.

Machinists' Union, No. 494. Date of organization, June, 1902; number of members, 10; initiation fee, \$5.00; monthly dues, 50 cents; hours of labor, 10; minimum daily wages, \$2.00; maximum daily wages, \$2.50.

Order of Railroad Telegraphers, No. 11. Date of organization, June, 1899; number of members, embracing the State, 300; initiation fee, \$3.50; death benefit, \$300, \$500 and \$1,000, with dues in proportion; hours of labor, dispatchers and operators at principal stations, 8; daily wages, station men and operators, \$1.53.

Painters, Decorators and Paperhangers' Union, No. 262. Date of organization, January 5, 1900; number of members, 117; qualifications for membership, must be a journeyman and able to command the minimum wage; initiation fee, \$10.00; monthly dues, 35 cents; death benefit, \$100 and \$150, according to length of membership; disability benefit, \$100; funeral benefit, \$50.00; hours of labor, 9; minimum daily wages, \$2.25.

Penobscot Teamsters' Union, No. 365. Date of organization, March 20, 1902; number of members, 95; qualifications for membership, must be of good character; initiation fee, \$5.00; monthly dues, 50 cents; times of meeting, every Friday; hours of labor, 9; minimum daily wages, \$1.75.

Slate, Gravel and Metal Roofers' Union, No. 10,229. Date of organization, August 25, 1902; number of members, 12; initiation fee, \$5.00; monthly dues, 50 cents; hours of labor, 9; minimum daily wages, \$2.00; maximum daily wages, \$2.50.

Stove Mounters' Union, No. 50. Date of organization, May 8, 1902; number of members, 20; initiation fee, \$3.00; monthly dues, 55 cents; times of meeting, first and third Tuesdays in each month; death benefit, \$100; hours of labor, 9; daily wages, \$1.75 and \$2.25.

Woodworkers' Union, No. 46. No return.

*Bath.*

Boilermakers and Iron Shipbuilders' Union. Number of members, 175; hours of labor, 10; daily wages, \$2.50 to \$3.00.

The brass polishers of Bath are organized but have no local union. They are affiliated with a union in Boston.

Bricklayers, Masons and Plasterers' Union. Date of organization, March 17, 1899; number of members, 35; qualifications for membership, must be a practical workman; initiation fee, \$10.00; monthly dues, 35 cents; times of meeting, every Monday; death benefit, \$1.00 assessment on each member; hours of labor, 8; minimum daily wages, \$3.25.

Carpenters and Joiners' Union, No. 1,663. Date of organization, July 1, 1903; number of members, 57; qualifications for membership, must be 21 years of age and of good moral character; initiation fee, \$5.00; monthly dues, 50 cents; times of meeting, every Tuesday evening; sick benefit, \$3.00 per week for 9 weeks; funeral benefit, \$100 to \$200; disability benefit, \$100 to \$400; hours of labor, 9; minimum daily wages, \$2.00 to \$2.50.

Iron Moulders' Union. Number of members, 30; initiation fee, \$5.00; death benefit, \$100 and \$200, according to length of membership; hours of labor, 9; daily wages, \$2.50 and \$2.75.

Machinists' Union, No. 466. Number of members, 100; initiation fee, \$3.00; times of meeting, second and fourth Fridays in each month; hours of labor, 10; daily wages, \$2.00 to \$2.50.

Painters, Decorators and Paper Hangers' Union. Number of members, 50; initiation fee, \$10.00; hours of labor, 9; minimum daily wages, \$2.25.

The printers of Bath are members of the Lewiston Typographical Union.

Riggers' Protective Union, No. 8,235. Number of members, 35; times of meeting, every Wednesday; hours of labor, 10 in summer and 9 in winter; wages, 30 cents per hour.

Sailmakers' Protective Union, No. 8,232. Date of organization, March 21, 1900; number of members, 21; qualifications for membership, must have served three years' apprenticeship; initiation fee, \$3.00; monthly dues, 35 cents; times of meeting, every Wednesday night; hours of labor, 9; minimum daily wages, \$3.00.

Ship Carpenters' Union. Number of members, 50; initiation fee, \$5.00; hours of labor, 10 in summer and 9 in winter; wages, 25 cents per hour.

*Biddeford.*

Bricklayers, Masons and Plasterers' Union. Number of members, 20; initiation fee, \$10.00; monthly dues 25 cents; hours of labor, 9; daily wages, \$3.00 and \$3.50.

Carpenters and Joiners' Union. Number of members, 50; initiation fee, \$5.00; monthly dues, 50 cents; times of meeting, twice a month; hours of labor, 9; daily wages, \$2.00 and \$2.25.

Cigarmakers' Union. Date of organization, 1889; number of members, 22; qualifications for membership, must be a competent workman; initiation fee, \$3.00; weekly dues, 30 cents; times of meeting, once a month; sick, death and strike benefits; hours of labor, 8; minimum weekly wages, \$15.00.

There are about 25 union granite cutters in Biddeford who are affiliated with the Portland Granite Cutters' Union.

Iron Moulders' Union. Date of organization, January, 1898; number of members, 150; qualifications for membership, must be a competent workman; initiation fee, \$5.00; monthly dues, \$1.00; times of meeting, first and third Wednesdays in each month; sick benefit, 5.00 per week for 13 weeks; insurance, \$100 and \$200 with dues in proportion; hours of labor, 10; minimum daily wages, \$2.50.

Loom Fixers' Union. Number of members, 25; initiation fee, \$2.00; monthly dues, 50 cents; hours of labor, 10 and 11; minimum daily wages, \$2.00.

Painters, Decorators and Paper Hangers' Union. Number of members, 45; hours of labor, 9; daily wages, \$2.25.

Plumbers' Union. Number of members, 20; hours of labor, 9; daily wages, \$3.00.

Slasher Tenders' Union. Number of members, 25; hours of labor, 10; daily wages, \$2.00.

Typographical Union. Date of organization, 1902; number of members, 15; qualifications for membership, must be a printer or pressman; initiation fee, \$2.00; monthly dues, 50 cents; hours of labor, 10 and 9; minimum weekly wages, \$10.00 to \$14.00.

*Bluehill.*

Granite Cutters' Union. Date of organization, 1881; number of members, 23; qualifications for membership, must be a competent workman; initiation fee, \$1.50; monthly dues, 70 cents; times of meeting, once a month; strike benefit, \$1.00 per day; funeral benefit, \$125; hours of labor, 8; minimum daily wages, \$2.80.

*Bluehill (East).*

Quarrymen's Union, No. 9,671. Date of organization, March, 1902; number of members, 45; initiation fee, \$1.00; monthly dues, 35 cents; times of meeting, first Monday in the month; hours of labor, 8; minimum daily wages, \$1.71.

*Brewer (South).*

Foundry Workers' Union. Date of organization, June 7, 1902; number of members, 9; initiation fee, \$2.00; monthly dues, 10 cents; times of meeting, second and fourth Tuesdays in each month; hours of labor, 9; minimum daily wages, \$1.33; maximum, \$2.00.

Papermakers' Union, No. 82. Date of organization, August 26, 1902; number of members, 20; qualifications for membership, one year's experience; times of meeting, first Sunday after the 5th of each month; hours of labor, 65 hours per week; minimum daily wages, \$1.50.

Pulp, Sulphite and Papermill Workers' Union, No. 56. Date of organization, April 19, 1903; number of members, 60; qualifications for membership, must be a competent workman; initiation fee, \$1.00; monthly dues, 35 cents; times of meeting, first and third Sundays in each month; hours of labor, 11; minimum hourly wages, 15 cents.

Sawmill Employes' Union, No. 10,039. Date of organization, June 18, 1902; number of members, 250; qualifications for membership, must have good moral character; initiation fee, \$1.00; monthly dues, 25 cents; times of meeting, every second Thursday; hours of labor, 10; minimum daily wages, \$2.50.

*Brownville (Henderson).*

Brotherhood of Locomotive Engineers, No. 440. Date of organization, 1890; number of members, 26; qualifications for membership, must be 21 years of age and a good citizen; initiation fee, \$10.00; monthly dues, \$2.00; times of meeting, twice a month; insurance, from \$750 to \$4,500, with dues in proportion; hours of labor, according to class of labor performed; minimum wages, from \$3.00 to \$4.50 per trip.

Brotherhood of Locomotive Firemen, Katahdin Lodge, No. 469. Number of members, 32.

Brotherhood of Railroad Trainmen, No. 366. Date of organization, May, 1898; number of members, 50; qualifications for membership, must be honorable and temperate; initiation fee, \$8.00; monthly dues, \$2.50; times of meeting, second Sunday and fourth Monday in each month; insurance, \$500, \$1,000 and \$1,350, with dues in proportion; hours of labor, 12; minimum daily wages, conductors, \$3.75, brakemen, \$2.75.

*Calais (Red Beach).*

Granite Cutters' Union. Date of organization, November, 1897; number of members, 48; initiation fee, from \$2.00 to \$25.00; monthly dues, 70 cents; times of meeting, once a month; death benefit, \$125; hours of labor, 8; minimum daily wages, \$2.80.

*East Livermore (Livermore Falls).*

Papermakers' Union, No. 11. Date of organization, May 28, 1899; number of members, 67; initiation fee, \$1.00 and \$2.00; times of meeting, first and third Sundays in each month; hours of labor, 11 and 13; minimum daily wages, \$2.29.

*Eden (Bar Harbor).*

Bricklayers and Masons' Union, No. 4. Date of organization, December 15, 1900; number of members, 84; qualifications for membership, must be a journeyman bricklayer or mason, and an American citizen; initiation fee, \$10.00; monthly dues, 25 cents; times of meeting, every Wednesday evening; hours of labor, 8; minimum daily wages, \$3.20.



Carpenters and Joiners' Union, No. 459. Date of organization, February 2, 1900; number of members, 246; qualifications for membership, must be a journeyman carpenter; initiation fee, \$10.00; monthly dues, 50 and 30 cents; times of meeting, weekly; death benefit, \$200; disability benefit, \$400; sick benefit, \$3.00 per week; hours of labor, 8; minimum daily wages, \$2.75.

Painters, Decorators and Paperhangers' Union, No. 142. Date of organization, May 30, 1900; number of members, 77; qualifications for membership, must be a journeyman workman; initiation fee, \$10.00; monthly dues, 50 cents; times of meeting, every Monday; disability or sick benefit, \$3.00 per week for 10 weeks; death benefit, \$150; hours of labor, 8; minimum daily wages, \$2.75.

Plumbers' Union, No. 416. Date of organization, April 4, 1903; number of members, 15; initiation fee, \$10.00; monthly dues, 30 cents; times of meeting, every Monday; hours of labor, 8; minimum daily wages, \$3.50.

#### *Frankfort.*

Mount Waldo Branch, Granite Cutters' Union. Date of organization, 1878; number of members, 150; qualifications for membership, must be a practical stone cutter; initiation fee, \$1.00; monthly dues, 70 cents; death benefit, \$125; hours of labor, 8; minimum daily wages, \$2.80.

#### *Gardiner.*

Bricklayers, Masons and Plasterers' Union, No. 12. Date of organization, November 29, 1902; number of members, 24; initiation fee, \$10.00; monthly dues, 25 cents; hours of labor, mason work, 8; minimum daily wages, brick work, \$3.00, stone work, \$2.50.

Brotherhood of Local Firemen, No. 186. Date of organization, May 3, 1903; number of members, 23; qualifications for membership, must be a competent fireman; initiation fee, \$2.00; monthly dues, 35 cents; times of meeting, once a month; hours of labor, 8; minimum daily wages, \$1.75.

Brotherhood of Painters, Decorators and Paperhangers of America, No. 1,048. Date of organization, September 2, 1903;

number of members, 34; qualifications for membership, must be under fifty years of age and a practical painter or paperhanger; initiation fee, \$3.00; monthly dues, 50 cents; times of meeting, tri-monthly; death benefit, \$150 on death of a member and \$50 on death of the wife of a member; hours of labor, 9; minimum daily wages, \$2.50.

Carpenters and Joiners of America, No. 1,259. Date of organization, September 28, 1902; number of members, 38; qualifications for membership, must be a journeyman carpenter or woodworker; initiation fee, \$5.00; monthly dues, beneficial, 50 cents, semi-beneficial, 30 cents; times of meeting, second and fourth Tuesdays in each month; death benefit, \$100 on 6 months and \$200 on 1 year's membership; disability benefit, \$100 on 1 year, \$200 on 2 years, \$300 on 3 years and \$400 on 5 years' membership; hours of labor, 9; minimum daily wages, \$2.00.

Federal Labor Union, No. 11,185. Date of organization, June 1, 1903; number of members, 54; qualifications for membership, must be an honest, temperate workman; initiation fee, \$1.00; monthly dues, 50 cents; times of meeting, first and third Tuesdays in each month; hours of labor, 10; minimum wages, long-shoremen, \$4.00 per day, teamsters, \$10.00 per week.

Papermakers' Union, Dirigo Lodge, No. 84. Date of organization, September 7, 1902; number of members, 165; qualifications for membership, machine help, one year's experience, female help, three months' experience; initiation fee, \$1.50 for men, 50 cents for women; monthly dues, 50 cents for men, 25 cents for women; strike benefit, \$5.00 for married men, \$3.50 for single men and \$3.00 for women; hours of labor, 10 for tour workers and 9 for day help; minimum daily wages, \$1.00.

Team Drivers' Union. No return.

*Hallowell.*

Federal Labor Union, No. 10,919. No return.

Hallowell Branch, Granite Cutters' Union. Date of organization, March 10, 1888; number of members, 184; qualifications for membership, must have served three years' apprenticeship; initiation fee, from \$1.00 to \$50.00; monthly dues, 50 cents; hours of labor, 8; minimum daily wages, \$2.80.

Quarrymen's Union, No. 9,748. Date of organization, March 20, 1902; number of members, 60; initiation fee, \$2.00; monthly

dues, 30 cents; times of meeting, first and third Tuesdays in each month; hours of labor, 8; minimum daily wages, \$1.75.

*Houlton.*

Aroostook Lodge, Railroad Trainmen, No. 303. Date of organization, July 22, 1900; number of members, 78; initiation fee, \$5.00; monthly dues, \$1.50; times of meeting, first and third Sundays in each month; benefits, life insurance and protection; hours of labor, 11; daily wages, from \$1.90 to \$3.20.

Brotherhood of Locomotive Engineers, No. 588. Date of organization, March 30, 1902; number of members, 45; qualifications for membership, must be 21 years of age, of good moral character, temperate habits, and a locomotive engineer in actual service; initiation fee, \$10.00; annual dues, \$5.00; times of meeting, first and third Sundays in each month; hours of labor, not exceeding 11; minimum daily wages, \$3.00.

Brotherhood of Locomotive Firemen, No. 587. Date of organization, June 22, 1901; number of members, 164; initiation fee, \$3.00; monthly dues, \$1.67; times of meeting, second and fourth Sundays in each month; insurance benefit, \$500 to \$3,000 with dues in proportion; hours of labor, 10; minimum daily wages, \$2.00.

*Hurricane Isle.*

Granite Cutters' Union. Organized at Rockland, March 10, 1877; number of members, 109; qualifications for membership, must be a practical granite cutter, or must have served three years' apprenticeship; initiation fee, from \$1.70 upward; monthly dues, 70 cents; death benefit, \$125; hours of labor, 8; minimum daily wages, \$2.80.

Paving Cutters' Union. Date of organization, October 15, 1901; number of members, 19; qualifications for membership, must be a practical workman; initiation fee, \$1.00; monthly dues, 30 cents; times of meeting, monthly; funeral benefit, \$75.00; hours of labor, 9; minimum daily wages, \$2.50.

*Jay (Chisholm).*

Laborers' Protective Union, No. 9,555. Date of organization, December 15, 1901; number of members, 350; qualifications for membership, must be a wage earner of good character; initia-

tion fee, \$1.00; times of meeting, every Sunday; hours of labor, 11 and 13; minimum daily wages, \$1.65.

*Jay (North).*

Granite Cutters' Union. Date of organization, August, 1891; number of members, 81; initiation fee, from \$1.00 to \$25.00; monthly dues, 70 cents; meetings, once a month; death benefit, \$125; hours of labor, 8; minimum daily wages, \$2.80.

Quarrymen's Union, No. 9,789. Date of organization, May 24, 1902; number of members, 45; qualifications for membership, must be a competent workman; initiation fee, \$2.50; monthly dues, 50 cents; times of meeting, first Thursday in each month; death benefit, \$50.00, also strike and sick benefit; hours of labor, 8; minimum daily wages, \$1.75.

*Lewiston.*

Bricklayers, Masons and Plasterers' Union. Date of organization, August, 1888; number of members, 118; qualifications for membership, must be a competent workman; initiation fee, \$10.00; monthly dues, 25 cents; times of meeting, every Monday; death benefit, assessment of \$1.00 on each member, 50 cents assessment on death of member's wife; hours of labor, 8; minimum daily wages, \$3.25.

Brotherhood of Painters, Decorators and Paperhangers. Number of members, 50; qualifications for membership, must be a competent workman; initiation fee, \$10.00; monthly dues, 35 cents; death benefit, \$100 and \$150 on death of a member and \$50 on death of wife of a member; hours of labor, 9; minimum daily wages, \$2.25.

Carpenters and Joiners' Union. Date of organization, May 11, 1888; number of members, 133; qualifications for membership, must be 21 years of age and must be a journeyman carpenter or wood worker of good character and competent to command standard wages; times of meeting, every Wednesday evening; sick, death and funeral benefits; hours of labor, 8; minimum daily wages, \$2.20.

Cigarmakers' Union. Date of organization, 1886; number of members, 52; death benefit, \$50.00 on 2 years, \$200 on 5 years, \$350 on 10 years and \$550 on 15 years' membership; sick benefit, \$5.00 per week; hours of labor, 8; average weekly wages, \$15.00.

Cotton Mule Spinners' Association. Number of members, 80; qualifications for membership, must be a competent spinner; monthly dues, \$1.00; strike benefit, from \$4.00 to \$6.00 a week during strikes or lockouts; hours of labor, 10; minimum daily wages, \$2.25.

Granite Cutters' Union. Date of organization, April 10, 1890; number of members, 27; initiation fee, \$1.00; monthly dues, 70 cents; times of meeting, once a month; death benefit, \$150; hours of labor, 8; daily wages, \$2.80 minimum and \$3.20 maximum.

Iron Moulders' Union. Number of members, 40; qualifications for membership, must have served apprenticeship for four years; initiation fee, \$5.00; hours of labor, 10; minimum daily wages, \$2.50.

Masons' Tenders' Federal Union, No. 1,272. Number of members, 30; initiation fee, \$5.00; monthly dues, 25 cents; hours of labor, 8; minimum daily wages, \$1.75.

Retail Clerks' International Protective Association. Date of organization, June, 1903; number of members, 94; qualifications for membership, must be 18 years of age, and must have been a clerk for one year; hours of labor, 11; minimum weekly wages, \$3.00.

Typographical Union. Date of organization, September 11, 1902; number of members, 47; qualifications for membership, four years at the trade; initiation fee, \$4.00; monthly dues, 60 cents; times of meeting, every other Saturday evening; strike benefit, \$7.00 for married men, \$5.00 for single men, per week; insurance benefit, \$65.00; hours of labor, 9; minimum weekly wages, \$10.00.

#### *Madison.*

Brotherhood of Stationary Firemen, No. 12. Date of organization, June 12, 1902; number of members, 47; initiation fee, \$2.00; times of meeting, every Saturday; hours of labor, 12; minimum daily wages, \$1.50; maximum, \$2.25.

Carpenters and Joiners' Union, No. 1,031. Date of organization, March 19, 1902; number of members, 45; qualifications for membership, must be a journeyman carpenter or wood worker; initiation fee, \$5.00; monthly dues, 50 cents; times of meeting,

first and third Mondays in each month; death benefit, from \$50.00 to \$400; hours of labor, 9; no established scale of wages.

*Millinocket.*

Federal Labor Union, No. 11,311. Date of organization, July 18, 1903; number of members, 23; initiation fee, \$3.00; monthly dues, 50 cents; times of meeting, twice a month, Mondays; hours of labor, 10; minimum daily wages, \$1.75 to \$2.50.

Local Firemen's Union. Number of members, 38; initiation fee, \$5.00; monthly dues, 50 cents; hours of labor, 8; minimum daily wages, \$1.75.

Paper Makers' Union. Date of organization, 1902; number of members, 100; initiation fee, \$1.00 and \$2.00; monthly dues, 60 cents; hours of labor, 8; minimum daily wages, \$3.50.

*Mount Desert (Hall Quarry).*

Quarrymen's Protective Union. Date of organization, July 26, 1902; number of members, 37; qualifications for membership, must be a competent workman; initiation fee, \$1.00; monthly dues, 25 cents; times of meeting, once each month; hours of labor, 8; minimum daily wages, \$1.80.

*Norridgewock (South).*

Garment Workers' Union, No. 85, United Garment Workers of America. Date of organization, May 29, 1900; number of members, 72; initiation fee, \$1.00; monthly dues, 25 cents; hours of labor, 9; minimum daily wages, \$1.25.

Granite Cutters' Union. Date of organization, March, 1890; number of members, 8; qualifications for membership, 3 years' apprenticeship; initiation fee, \$1.00; monthly dues, 70 cents; death benefit, \$125; hours of labor, 8; minimum daily wages, \$2.80.

*Orono.*

Papermakers' Union. No return.

Sawmill Employes' Union. No return.

*Portland.*

Bakery and Confectionery Workers' Union. Date of organization, October, 1902; number of members, 60; qualifications for membership, must have worked 2 years at the trade; initiation fee, \$5.00; monthly dues, 60 cents; times of meeting, first and third Saturdays in each month; hours of labor, 10; weekly wages, foremen, \$18.00, second hands, \$14.00, bench hands, \$12.00.

Barbers' Union, No. 210. Date of organization, April 4, 1900; number of members, 20; qualifications for membership, must be a competent workman; monthly dues, 60 cents; times of meeting, first and third Thursdays in each month; death benefit, \$60.00; sick benefit, \$5.00 per week; hours of labor, 69 per week, close Friday nights at 6 o'clock, other nights at 8 o'clock, except Saturdays; minimum weekly wages, \$10.00.

Boot and Shoemakers' Union. No return.

Bricklayers, Masons and Plasterers' Union, No. 2. Date of organization, June 25, 1890; number of members, 120; qualifications for membership, must be a competent workman; initiation fee, \$12.00; monthly dues, 50 cents; times of meeting, every Monday; sick benefit, \$5.00 per week; death benefit, \$100; hours of labor, 8; minimum daily wages, \$3.50 with double time for holidays and overtime.

Bricklayers' Tenders' Union, No. 9,231. Date of organization, May 12, 1901; number of members, 125; initiation fee, \$5.00; hours of labor, 8; daily wages, \$2.00 and \$2.25.

Brotherhood of Locomotive Engineers, No. 40. Number of members, 145; qualifications for membership, 1 year's experience as engineer; initiation fee, \$10.00; times of meeting, second and fourth Sundays in each month; insurance benefit, \$750, \$1,500, \$3,000 and \$4,500, with dues in proportion; minimum daily wages, \$3.50.

Brotherhood of Locomotive Firemen, No. 4. Date of organization, 1872; number of members, 108; qualifications for membership, must be of good moral character, and have had 9 months' experience; initiation fee, \$3.00; monthly dues, \$3.00, \$4.50 and \$5.50; times of meeting, first and third Sundays in each month; insurance, from \$500 to \$3,000; hours of labor, not over 11; minimum daily wages, \$1.50.

Brotherhood of Railroad Trainmen, No. 82. Date of organization, April 26, 1896; number of members, 400; qualifications for membership, must be 18 years of age and of good moral character; initiation fee, \$5.00; monthly dues, \$1.50, \$2.25, \$2.75; times of meeting, first and third Sundays in each month; sick benefit, \$5.00 per week for 16 weeks; insurance, \$500, \$1,000 and \$1,350, with dues in proportion; hours of labor, 11; minimum daily wages, \$2.00.

Car Inspectors and Repairers' Union. This union was organized in 1902, with 50 members. It includes employes from the Boston and Maine, Maine Central and Grand Trunk railroads at all the yards and repair shops in this section; it has funeral and sick benefits.

Carpenters and Joiners' Union. Date of organization, March 19, 1900; number of members, 100; qualifications for membership, must be of good character and a journeyman carpenter or woodworker of ability; initiation fee, \$5.00; monthly dues, 50 cents; times of meeting, second and fourth Fridays in each month; death benefit, \$100 and \$200, according to length of membership; disability benefit, \$100, \$200, \$300 and \$400, according to length of membership; hours of labor, 9; minimum daily wages, \$2.00 and \$2.50.

Cigarmakers' Union, No. 70. Date of organization, 1879; number of members, 20; times of meeting, first Friday in each month; hours of labor, 8; weekly wages, \$15.00. This organization has sick, out of work and death benefits.

International Association of Machinists, Oriental Lodge, No. 216. Date of organization, May 7, 1901; number of members, 56; initiation fee, \$3.00; monthly dues, 75 cents; times of meeting, second and fourth Tuesdays in each month; death benefit, \$50.00 and \$200; sick benefit, \$4.00 to \$6.00 weekly; hours of labor, 10; minimum daily wages, \$2.00.

Iron Moulders' Union, No. 248. Date of organization, August 29, 1896; number of members, 50; qualifications for membership, must have served four years' apprenticeship; initiation fee, \$5.00; sick, disability and death benefits; monthly dues, \$1.00; hours of labor, 10; minimum daily wages, \$2.50 with double time for Sundays and holidays.

Local Union of Brothers of Portland. This is the name of a union recently formed by the Portland electric street railway employes, including those on the Yarmouth and Brunswick line.



Longshoremen's Benevolent Society. Date of organization, October, 1880; number of members, 650; qualifications for membership, must be an American citizen, and a resident of Portland for six months next preceding application; initiation fee, \$5.00; monthly dues, 50 cents; times of meeting, weekly; sick benefit, \$5.00 per week for 10 weeks every 2 years with society physician to attend; death benefit, \$100; hours of labor, no limit, paid by the hour, 30 cents for day work, 40 cents for night work, and 60 cents per hour trimming grain; wages average \$1.75 per day.

Millmen's Union, United Brotherhood of Carpenters and Joiners of America, No. 1,474. Date of organization, February, 1903; number of members, 50; qualifications for membership, must be a competent journeyman or apprentice; initiation fee, \$5.00; monthly dues, 50 cents; times of meeting, first and third Mondays in each month; hours of labor, 10; minimum daily wages, not yet fixed.

Order of Railway Conductors, Pine Tree Division, No. 66. Date of organization, March 16, 1890; number of members, 125; initiation fee, \$5.00; grand dues, \$2.00; local dues, regulated by the lodge; insurance, \$1,000, \$2,000 and \$3,000, with dues in proportion; other benefits regulated by the lodge; wages governed by distance run.

Painters, Decorators and Paperhangers' Union, No. 237. Date of organization, October 29, 1900; number of members, 30; qualifications for membership, must be a competent workman; meetings, twice a month, Thursdays; hours of labor, 9; daily wages, \$2.00 and \$2.50.

Plumbers and Steamfitters' Union. Number of members, 40; times of meeting, first and third Wednesdays in each month.

Portland Branch, Atlantic Coast Seamen's Union. Date of organization, February, 1890; qualifications for membership, must be a practical seaman; initiation fee, \$5.00; monthly dues, 70 cents; times of meeting, every Monday; permanently disabled benefit, \$200; sick benefit, \$5.00 per week; shipwreck benefit, \$25.00; hours of labor, 12 at sea and 9 in port. The headquarters for this union are in Boston. There are only two branches in Maine, one in Portland, one in Bangor.

Portland Branch, Granite Cutters. Date of organization, March 10, 1877; number of members, 60; initiation fee, \$1.00;

times of meeting, third Friday in each month; death benefit, \$125; hours of labor, 8; minimum daily wages, \$2.80.

Portland Typographical Union, No. 66. Date of organization, April 3, 1885; number of members, 70; qualifications for membership, must have worked 4 years at trade; initiation fee, \$2.00; monthly dues, 50 cents; times of meeting, second Saturday in each month; funeral benefit, \$70.00; hours of labor, 9; minimum weekly wages, \$14.00.

Printing Pressmen's Union, No. 22. Date of organization, January 11, 1898; number of members, 50; qualifications for membership, must have served 4 years' apprenticeship, and must be 21 years of age; monthly dues, pressmen, 40 cents, feeders, 30 cents; death benefit, \$100.

Railway Freight Handlers' Union. Number of members, 50; times of meeting, first and third Sundays in each month.

Retail Clerks' Protective Association. Date of organization, July, 1902; number of members, 100; qualifications for membership, any competent clerk except clerks in liquor trade; initiation fee, \$1.00; monthly dues, 25 cents for men, 12½ cents for women; times of meeting, second and fourth Friday evenings in each month; death benefit, \$100; hours of labor, not fixed as yet; minimum daily wages, not fixed as yet.

Team Drivers' Local Union, No. 282. Date of organization, June 6, 1901; number of members, 100; initiation fee, \$1.00; monthly dues, 50 cents; times of meeting, first and third Thursdays in each month; hours of labor, no limit; minimum daily wages, \$1.50.

Wood, Wire and Metal Lathers' Union. Date of organization, June 10, 1902; number of members, 50; times of meeting, first and third Wednesdays in each month; hours of labor, 9; minimum daily wages, \$1.50.

*Rockland.*

Cigarmakers' Union. No returns.

*Rumford (Falls).*

Barber's Union. Number of members, 20; hours of labor, 65 per week; weekly wages, \$10.00 to \$12.00.

Bricklayers, Masons and Plasterers' Union. Number of

members, 50; times of meeting, twice a month; hours of labor, 9; daily wages, masons, \$3.00, bricklayers, \$3.50.

Painters, Paperhangers and Decorators' Union. Number of members, 50; initiation fee, \$10.00; monthly dues, 35 cents; hours of labor, 9; daily wages, \$2.00 and \$2.25.

Pulp, Sulphite and Papermill Workers' Union. Date of organization, November 27, 1902; number of members, 850; qualifications for membership, must be a competent workman; initiation fee, \$2.00; monthly dues, 25 cents; times of meeting, every Saturday evening; hours of labor, tour work, 11 and 13 hours; wages, \$1.50 per day for day work, 16½ cents per hour for tour work.

Retail Clerks' Protective Association. Number of members, 40; organized to obtain uniformity in closing stores on evenings and holidays.

Stationary Firemen's Union, No. 38. This union embraces firemen, engineers, oilers, coalmen, electrical engineers, etc. Date of organization, July 15, 1902; number of members, 75; initiation fee, \$5.00; monthly dues, 40 cents; times of meeting, first and third Mondays in each month; hours of labor, 12; minimum daily wages, \$2.04.

Steam and Hot Water Fitters and Helpers' Union. Date of organization, May 20, 1902; number of members, 23; qualifications for membership, must have worked 3 years at the business and be a citizen of the United States; initiation fee, fitters, \$10.00, helpers, \$5.00; monthly dues, fitters, 50 cents, helpers, 35 cents; times of meeting, first and third Thursdays in each month; hours of labor, 10; minimum daily wages, plumbers, \$3.00, helpers, \$1.75.

United Brotherhood of Carpenters and Joiners, No. 1,189. Date of organization, July 7, 1902; number of members, 125; qualifications for membership, 3 years' work at the trade and must not be over 50 years of age; initiation fee, \$5.00; meetings, every Tuesday evening; hours of labor, 10; minimum daily wages, \$2.25.

There have been formed recently in Rumford Falls the following labor organizations, of which only estimates as to membership have been received.

Blacksmiths' Union. Estimated membership, 10.

Machinists' Union. Estimated membership, 12.

Millwright and Woodworkers' Union. Estimated membership, 12.

Paper Bag Machine Tenders' Union.

Paper Bag Mill Workers' Union.

Papermakers' Union. Estimated combined membership of the three last named unions, 98.

Stationary Engineers' Union. Estimated membership, 15.

Teamsters' Union. Estimated membership, 20.

This makes a total of 16 labor organizations in this new town, with a combined membership of 1,400. The hours of labor are generally 10 and the minimum wage is \$1.65. The Pulp, Sulphite and Papermill Workers' Union has absorbed and taken the place of the Laborers' Protective Union, which was reported in 1902 with a membership of 730.

*Saint George (Clark Island).*

Granite Cutters' Union. Date of organization, March 10, 1877; number of members, 46; initiation fee, \$1.00; monthly dues, 70 cents; times of meeting, 20th of each month; hours of labor, 8; minimum daily wages, \$2.80.

*Sanford (Springvale).*

Boot and Shoemakers' Union. Number of members, 50; initiation fee, \$1.00; sick benefit, \$5.00 per week; hours of labor, 10; minimum daily wages, \$1.50.

*Skowhegan.*

Bricklayers, Masons and Plasterers' Union. Date of organization, July, 1901; number of members, 30; initiation fee, \$10.00; monthly dues, 25 cents; times of meeting, first and third Mondays in each month; death benefit, \$100; other benefits, local; hours of labor, 9; minimum daily wages, \$3.00.

Carpenters and Joiners' Union. Date of organization, April 6, 1901; number of members, 60; qualifications for membership, must be a practical carpenter or woodworker and an American citizen; initiation fee, \$5.00; monthly dues, 50 cents; times of meeting, second and fourth Saturdays in each month; funeral benefit, \$200 on death of a member, and \$50.00 on death of a member's wife; disability benefit, \$100, \$200, \$300 and \$400,

according to length of membership; sick benefit, regulated by the local union; hours of labor, 9; minimum daily wages, \$2.25.

Laborers' Protective Union. Date of organization, September, 1902; number of members, 182; initiation fee, \$1.00; monthly dues, 20 cents; times of meeting, second and fourth Fridays in each month; hours of labor, 9; minimum daily wages, \$1.50.

Painters, Decorators and Paperhangers' Union. Date of organization, April 28, 1902; number of members, 40; qualifications for membership, must be a first class workman; initiation fee, \$5.00; monthly dues, 35 cents; times of meeting, every Tuesday evening; death benefit, \$150 on death of a member and \$50.00 on death of a member's wife; hours of labor, 9; minimum daily wages, \$2.00.

#### *South Thomaston (Spruce Head).*

Granite Cutters' Union. Date of organization, March 10, 1877; number of members, 68; qualifications for membership, 3 years' apprenticeship; initiation fee, \$1.00; monthly dues, 70 cents; times of meeting, once a month; death benefit, \$125; strike benefit, \$1.00 per day; hours of labor, 8; minimum daily wages, \$2.80.

#### *Stonington.*

Granite Cutters' Union. Date of organization, May 1, 1891; number of members, 74; qualifications for membership, must be a practical cutter; initiation fee, \$1.70; monthly dues, 70 cents; times of meeting, third Friday in each month; death benefit, \$125; hours of labor, 8; minimum daily wages, \$3.00.

#### *Thomaston.*

Sailmakers' Protective Union, No. 9,624. Number of members, 25; initiation fee, \$3.00; monthly dues, 35 cents; hours of labor, 9; minimum daily wages, \$3.00.

#### *Vinalhaven.*

Granite Cutters' Union. Number of members, 135; initiation fee, \$1.00; monthly dues, 70 cents; death benefit, \$125; hours of labor, 8; minimum daily wages, \$2.80.

*Waldoboro.*

Granite Cutters' Union. Date of organization, June 6, 1899; number of members, 125; qualifications for membership, must have served 3 years' apprenticeship; initiation fee, \$1.70; monthly dues, 70 cents; times of meeting, once a month; death benefit, \$125; hours of labor, 8; minimum daily wages, \$2.80.

Quarrymen's Protective Union, No. 10,034. Date of organization, June 23, 1902; number of members, 65; qualifications for membership; must be 18 years old and a competent workman; initiation fee, \$1.50; monthly dues, 50 cents; times of meeting, second Wednesday in each month; hours of labor, 8; minimum daily wages, \$1.60.

*Waterville.*

Bricklayers, Masons and Plasterers' Union, No. 8. Date of organization, April, 1899; number of members, 65; qualifications for membership, must be a competent journeyman; initiation fee, \$10.00; monthly dues, 85 cents; times of meeting, every Wednesday evening; accident benefit, \$2.00 per week; hours of labor, 9; minimum daily wages, \$3.25.

Brotherhood of Railroad Trainmen, No. 343. Date of organization, 1897; initiation fee, \$3.00; number of members, 70; times of meeting, second and fourth Sundays in each month; insurance benefit, \$400 to \$1,200 with dues in proportion; hours of labor, 10 in yard, 11 on train; daily wages, brakemen, \$2.00 in yard, \$2.10 on train; switchmen, foremen, \$2.10, helpers, \$1.95, with increased pay for night work.

Carpenters and Joiners' Union, No. 348. Date of organization, 1898; number of members, 86; qualifications for membership, must be a competent journeyman carpenter or woodworker; initiation fee, \$5.00; monthly dues, 50 cents; times of meeting, every Monday evening; funeral benefit, \$200 on death of a member and \$50.00 on death of a member's wife; sick benefit, \$3.50 per week for 10 weeks in a year; hours of labor, 9; minimum daily wages, \$2.25.

Car Workers' Union, Pine Tree Lodge, No. 144. Date of organization, June 9, 1903; number of members, 110; qualifications for membership, must be a competent car worker; initiation fee, \$1.00; monthly dues, 25 cents; hours of labor, 10; minimum daily wages, \$1.25.

## CENTRAL LABOR UNIONS AND TRADE COUNCILS.

There are central labor unions in Augusta, Bangor, Bath, Lewiston, Portland and Rumford Falls. A central labor union is made up of delegates from the various trade unions located within its jurisdiction often including several towns. It has no authority to interfere with the acts of the different unions, their funds or their members. It can only act when the general welfare is concerned or upon application. It cannot order strikes or lockouts, neither can it originate demands, but it can give moral and financial support and arouse public opinion when the cause justifies such action. It may investigate grievances between unions, or, upon request, will investigate any troubles between a union and its employers.

But one trade council is reported, that being a building trades council, located in Bangor, and made up of delegates from the different building trade unions. It meets the second and fourth Mondays in each month.

## DAYS LOST, DAYS WORKED, DAILY WAGES AND ANNUAL EARNINGS.

Questions 12, 13 and 14 on the blanks are as follows: "Average number of days lost per individual during the year?" "Average number of days worked per individual during the year?" "Total average amount of wages per individual during the year?"

The above questions were not answered on all the blanks, but a sufficient number of responses were made to enable us to form very correct estimates in 52 unions included in 25 trades, and the results are here presented. By dividing the average annual earnings by the average number of days worked we obtain the average daily wages. We give the number of members, the average number of days lost, the average number of days worked, the average daily wages and the average annual earnings, per individual workman, in each union so reporting, also in each trade, each group of trades, and in the combination of all the trades.

*Builders.*

From the carpenters and joiners six returns contained answers to the questions, as follows:

1. Membership, 100; average days lost, 78; average days worked, 234; average daily wages, \$2.50; average annual earnings, \$585.

2. Membership, 116; average days lost, 30; average days worked, 282; average daily wages, \$2.25; average annual earnings, \$634.

3. Membership, 264; average days lost, 60; average days worked, 252; average daily wages, \$2.25; average annual earnings, \$566.

4. Membership, 86; average days lost, 62; average days worked, 250; average daily wages, \$2.25; average annual earnings, \$562.

5. Membership, 246; average days lost, 47; average days worked, 265; average daily wages, \$2.75; average annual earnings, \$728.

6. Membership, 133; average days lost, 80; average days worked, 232; average daily wages, \$2.21; average annual earnings, \$513.

Total membership in the 6 unions reporting, 945; average days lost, 58; average days worked, 254; average daily wages, \$2.39; average annual earnings, \$608.

From the bricklayers, masons and plasterers seven returns contained answers to the questions, as follows:

1. Membership, 42; average days lost, 147; average days worked, 165; average daily wages, \$3.00; average annual earnings, \$495.

2. Membership, 90; average days lost, 124; average days worked, 188; average daily wages, \$3.33; average annual earnings, \$626.

3. Membership, 24; average days lost, 78; average days worked, 234; average daily wages, \$2.75; average annual earnings, \$643.

4. Membership, 65; average days lost, 112; average days worked, 200; average daily wages, \$3.25; average annual earnings, \$650.



5. Membership, 84; average days lost, 112; average days worked, 200; average daily wages, \$3.20; average annual earnings, \$640.

6. Membership, 118; average days lost, 147; average days worked, 165; average daily wages, \$3.27; average annual earnings, \$540.

7. Membership, 120; average days lost, 100; average days worked, 212; average daily wages, \$3.50; average annual earnings, \$742.

Total membership in the 7 unions reporting, 543; average days lost, 120; average days worked, 192; average daily wages, \$3.27; average annual earnings, \$628.

From the plumbers and steam and hot water fitters two returns contained answers to the questions, as follows:

1. Membership, 23; average days lost, 19; average days worked, 293; average daily wages, \$3.00; average annual earnings, \$877.

2. Membership, 15; average days lost, 0; average days worked, 312; average daily wages, \$3.50; average annual earnings, \$1,092.

Total membership in the 2 unions reporting, 38; average days lost, 11; average days worked, 301; average daily wages, \$3.20; average annual earnings, \$962.

From the painters, decorators and paperhangers four returns contained answers to the questions, as follows:

1. Membership, 117; average days lost, 69; average days worked, 243; average daily wages, \$2.25; average annual earnings, \$547.

2. Membership, 40; average days lost, 52; average days worked, 260; average daily wages, \$2.00; average annual earnings, \$520.

3. Membership, 77; average days lost, 82; average days worked, 230; average daily wages, \$2.50; average annual earnings, \$575.

4. Membership, 34; average days lost, 122; average days worked, 190; average daily wages, \$2.50; average annual earnings, \$475.

Total membership in the 4 unions reporting, 268; average days lost, 77; average days worked, 235; average daily wages, \$2.31; average annual earnings, \$542.

For the 4 building trades above mentioned, total membership in the 19 unions reporting, 1,784; average days lost, 78; average days worked, 234; average daily wages, \$2.63; average annual earnings, \$614.

*Cotton Mill Workers.*

There is only one carders' union and the report was as follows:

1. Membership, 80; average days lost, 12; average days worked, 300; average daily wages, \$1.50; average daily earnings, \$450.

From the mule spinners only one return contained answers to the questions, as follows:

1. Membership, 40; average days lost, 32; average days worked, 280; average daily wages, \$2.41; average annual earnings, \$675.

From the loomfixers only one return contained answers to the questions, as follows:

1. Membership, 27; average days lost, 24; average days worked, 288; average daily wages, \$2.00; average annual earnings, \$576.

For the 3 cottonmill trades above mentioned, total membership in the three unions reporting, 147; average days lost, 20; average days worked, 292; average daily wages, \$1.83; average annual earnings, \$534.

*Clothing Makers.*

There is only one union of garment workers, and the report was as follows:

1. Membership, 72; average days lost, 102; average days worked, 210; average daily wages, \$1.25; average annual earnings, \$262.

There is only one union of suspender workers and the report was as follows:

1. Membership, 8; average days lost, 22; average days worked, 290; average daily wages, \$1.90; average annual earnings, \$550.

For the 2 clothing makers' trades above mentioned, total membership in the two unions reporting, 80; average days lost, 94; average days worked, 218; average daily wages, \$1.33; average annual earnings, \$291.

*Granite Workers.*

From the quarrymen three returns contained answers to the questions, as follows:

1. Membership, 37; average days lost, 12; average days worked, 300; average daily wages, \$1.90; average annual earnings, \$540.

2. Membership, 60; average days lost, 12; average days worked, 300; average daily wages, \$1.75; average annual earnings, \$525.

3. Membership, 45; average days lost, 26; average days worked, 286; average daily wages, \$1.75; average annual earnings, \$500.

Total membership in the 3 unions reporting, 142; average days lost, 16; average days worked, 296; average daily wages, \$1.76; average annual earnings, \$521.

From the granite cutters five returns contained answers to the questions, as follows:

1. Membership, 74; average days lost, 38; average days worked, 274; average daily wages, \$3.00; average annual earnings, \$822.

2. Membership, 68; average days lost, 130; average days worked, 182; average daily wages, \$2.80; average annual earnings, \$510.

3. Membership, 184; average days lost, 44; average days worked, 268; average daily wages, \$2.80; average annual earnings, \$750.

4. Membership, 8; average days lost, 80; average days worked, 232; average daily wages, \$2.80; average annual earnings, \$650.

5. Membership, 60; average days lost, 13; average days worked, 299; average daily wages, \$2.80; average annual earnings, \$837.

Total membership in the 5 unions reporting, 394; average days lost, 54; average days worked, 258; average daily wages, \$2.81; average annual earnings, \$726.

There is but one paving cutters' union, and the report was as follows:

1. Membership, 19; average days lost, 52; average days worked, 260; average daily wages, \$2.50; average annual earnings, \$650.

For the 3 granite workers' trades above mentioned, total membership in the 9 unions reporting, 555; average days lost, 44; average days worked, 268; average daily wages, \$2.50; average annual earnings, \$671.

*Iron Workers.*

From the machinists only one return contained answers to the questions, as follows:

1. Membership, 56; average days lost, 15; average days worked, 297; average daily wages, \$2.36; average annual earnings, \$700.

*Laborers.*

From the laborers three returns contained answers to the questions, as follows:

1. Membership, 150; average days lost, 40; average days worked, 272; average daily wages, \$1.75; average annual earnings, \$476.

2. Membership, 182; average days lost, 30; average days worked, 282; average daily wages, \$1.50; average annual earnings, \$423.

3. Membership, 45; average days lost, 20; average days worked, 292; average daily wages, \$1.75; average annual earnings, \$511.

Total membership in the 3 unions reporting, 377; average days lost, 33; average days worked, 279; average daily wages, \$1.63; average annual earnings, \$455.

*Printers.*

From the printers two returns contained answers to the questions, as follows:

1. Membership, 47; average days lost, 12; average days worked, 300; average daily wages, \$1.73; average annual earnings, \$520.

2. Membership, 70; average days lost, 12; average days worked, 300; average daily wages, \$2.33; average annual earnings, \$700.

Total membership in the two unions reporting, 117; average days lost, 12; average days worked, 300; average daily wages, \$2.09; average annual earnings, \$628.

*Pulp and Papermakers.*

From the papermakers two returns contained answers to the questions, as follows:

1. Membership, 23; average days lost, 0; average days worked, 365; average daily wages, \$2.00; average annual earnings, \$730.

2. Membership, 20; average days lost, 0; average days worked, 330; average daily wages, \$2.43; average annual earnings, \$803.

Total membership in the two unions reporting, 43; average days lost, 0; average days worked, 349; average daily wages, \$2.19; average annual earnings, \$764.

From the pulp, sulphite and papermill workers two returns contained answers to the questions, as follows:

1. Membership, 60; average days lost, 0; average days worked, 362; average daily wages, \$1.65; average annual earnings, \$597.

2. Membership, 54; average days lost, 12; average days worked, 300; average daily wages, \$2.00; average annual earnings, \$600.

Total membership in the 2 unions reporting, 114; average days lost, 0; average days worked, 333; average daily wages, \$1.80; average annual earnings, \$598.

For the 2 paper and pulp trades above mentioned, total membership in the 4 unions reporting, 157; average days lost, 0; average days worked, 337; average daily wages, \$1.91; average annual earnings, \$644.

*Railway Employes.*

From the locomotive engineers only one return contained answers to the questions, as follows:

1. Membership, 45; average days lost, 4; average days worked, 308; average daily wages, \$3.57; average annual earnings, \$1,100.

From the locomotive firemen only one return contained answers to the questions, as follows:

1. Membership, 164; average days lost, 12; average days worked, 300; average daily wages, \$2.00; average annual earnings, \$600.

For the 2 railway trades above mentioned, total membership in the 2 unions reporting, 209; average days lost, 10; average days worked, 302; average daily wages, \$2.34; average annual earnings, \$708.

*Sailors and Longshoremen.*

Longshoremen work by the hour. They lose a great deal of time, as their work only comes when a vessel is either discharging or loading cargo. The average annual earnings per individual as given in the return from the Portland union, is \$550.

From the seamen two returns contained partial answers to the questions, as follows:

1. Months lost, 2; months worked, 10; annual earnings, \$350.
2. Months lost, 3; months worked, 9; annual earnings, \$250.

*Stationary Firemen.*

From the local firemen two returns contained answers to the questions, as follows:

1. Membership, 75; average days lost, 2; average days worked, 310; average daily wages, \$1.65; average annual earnings, \$512.
2. Membership, 23; average days lost, 12; average days worked, 300; average daily wages, \$1.75; average annual earnings, \$525.

Total membership in the two unions reporting, 98; average days lost, 4; average days worked, 308; average daily wages, \$1.67; average annual earnings, \$515.

*Team Drivers.*

From the team drivers only one return contained answers to the questions, as follows:

1. Membership, 95; average days lost, 12; average days worked, 300; average daily wages, \$1.75; average annual earnings, \$525.

*Wood Workers.*

From the sawmill employes only one return contained answers to the questions, as follows:

1. Membership, 250; average days lost, 152; average days worked, 160; average daily wages, \$2.50; average annual earnings, \$400.

*Miscellaneous Trades.*

There is only one bakers and confectioners' union, and the report was as follows:

1. Membership, 60; average days lost, 12; average days worked, 300; average daily wages, \$2.43; average annual earnings, \$728.

From the barbers only one return contained answers to the questions, as follows:

1. Membership, 34; average days lost, 22; average days worked, 290; average daily wages, \$1.67; average annual earnings, \$483.

There is only one union of electrical workers, and the report was as follows:

1. Membership, 12; average days lost, 10; average days worked, 302; average daily wages, \$1.99; average annual earnings, \$600.

For the 3 miscellaneous trades above mentioned, total membership in the 3 unions reporting, 106; average days lost, 15; average days worked, 297; average daily wages, \$2.14; average annual earnings, \$635.

For the combination of the 25 trades above mentioned, total membership in the 52 unions reporting, 4,041; average days lost, 57; average days worked, 255; average daily wages, \$2.31; average annual earnings, \$588.

*Synopsis.*

Among the 25 trades above enumerated the sawmill employes, masons, garment workers, painters, carpenters and joiners, granite cutters and paving cutters all lost a large amount of time.

In the case of the sawmill employes their work is continuous through the season, which lasts practically one half the year. It is not to be supposed that they are idle during the rest of the year, in fact the most of them go to the lumber woods or seek other employments during the winter and spring months, so that lost time in this case does not mean a dead loss, although many of the workmen receive lower wages than in the sawmills.

The return from the garment workers shows a loss of nearly one-third of working time, or nearly 102 days. The time lost

on account of the strike amounted to 27 days, leaving 75 days of lost time from other causes which do not appear in the return.

The employes in the three leading building trades, the masons, painters and carpenters, were the next heaviest losers of time in the order named. The inclement season of winter without doubt contributed mainly to this loss, although the strike at Bar Harbor increased it somewhat.

In the granite business granite cutters and paving cutters lost 54 and 52 days respectively, while the quarrymen lost but 16. No cause is assigned for loss of time by these workmen, except an intimation in one instance. In one return from a granite cutters' union the statement is made that "the men as a rule get in very near full time here 'if they wish.'"

The laborers show 33 days, the mule spinners 32, and the loomfixers 27 days of lost time, while bakers, barbers, carders, electrical workers, machinists, plumbers, painters, quarrymen, railroad employes, stationary firemen, suspender workers and team drivers, lose no more time than is necessary for a brief annual vacation and time deducted on account of sickness, to say nothing of holidays.

The papermakers worked 37 days and the pulp, sulphite and papermill workers 21 days of overtime, beyond the 312 which we have used as the basis of working days in the year. The gross earnings on account of overtime worked by the 157 members of the unions reporting, amounted to \$7,496.75, an average of \$47.75 per individual.

The trades showing annual earnings in excess of the average are the carpenters, masons, plumbers, mule spinners, granite cutters, paving cutters, machinists, printers, papermakers, pulp, sulphite and papermill workers, locomotive engineers, locomotive firemen, bakers and electrical workers; while those that show less than the average are the painters, carders, loomfixers, garment workers, suspender workers, quarrymen, laborers, stationary firemen, team drivers, sawmill employes and barbers.

The trades showing daily wages equal to or in excess of the average are the carpenters, masons, plumbers, painters, mule spinners, granite cutters, paving cutters, machinists, locomotive engineers, sawmill employes and bakers; while those that show less than the average are the carders, loomfixers, garment workers, suspender workers, quarrymen, laborers, printers,



papermakers, pulp, sulphite and papermill workers, locomotive firemen, stationary firemen, team drivers, barbers and electrical workers.

As above noted the unions returning lost time and annual earnings have a membership of 4,041, an average of lost time of 57 days, an average daily wage of \$2.31, and an average annual wage of \$588. This would show \$2,376,108 as the gross annual earnings of the 4,041 workmen mentioned, with a loss in wages of \$532,078 on account of lost time, or \$131.67 to an individual. Assuming the results adduced from the 52 unions making these returns to be fairly representative in all their parts of the total of organized labor in the State, the gross annual earnings of all such labor would be \$8,002,092, with a loss in wages of \$1,791,907 on account of lost time.

#### RESULTS OF ORGANIZATION.

In answer to the 15th question on the blanks sent out, "What have you accomplished for labor by organization?" the replies were practically unanimous in naming two results, namely, "shorter hours" and "increased wages."

Other results were named quite frequently, as follows: "a better class of workmen;" "a better understanding between employers and employes;" "increased mutual respect between employers and employes;" a more manly self-respecting and independent spirit among workmen generally."

#### LOCATION, MEMBERSHIP, HOURS OF LABOR AND MINIMUM WAGES.

##### *Builders.*

The carpenters and joiners have organizations in Augusta, Bangor, Bath, Biddeford, Eden (Bar Harbor), Gardiner, Lewiston, Madison, Portland, Rumford (Falls), Skowhegan and Waterville, with a membership of 1,320. They work from 8 to 10 hours a day, with a minimum wage from \$2.00 to \$3.25.

The bricklayers, masons and plasterers have organizations in Augusta, Bangor, Bath, Biddeford, Eden (Bar Harbor), Gardiner, Lewiston, Portland, Rumford (Falls), Skowhegan and Waterville, with a total membership of 678. They work from 8 to 9 hours a day, with a minimum wage from \$3.00 to \$3.50.

The masons' tenders have organizations in Augusta, Bangor, Lewiston and Portland, with a membership of 287. They work from 8 to 9 hours a day, with a minimum wage from \$1.75 to \$2.10.

The wood, wire and metal lathers have an organization in Portland with 50 members. They work 9 hours a day, with a minimum wage of \$1.50.

The slate, gravel and metal roofers have an organization in Bangor with 12 members. They work 9 hours a day, with a minimum wage ranging from \$2.00 to \$2.50.

The plumbers and steamfitters have organizations in Bangor, Biddeford, Eden (Bar Harbor), Portland and Rumford (Falls), with a membership of 128. They work from 8 to 10 hours a day, with a minimum wage from \$3.00 to \$3.50.

The painters, decorators and paperhangers have organizations in Augusta, Bangor, Bath, Biddeford, Eden (Bar Harbor), Gardiner, Lewiston, Portland, Rumford (Falls) and Skowhegan, with a membership of 529. They work generally 9 hours, although at Bar Harbor the 8 hour day has been adopted. The minimum daily wage is from \$2.00 to \$2.75.

#### *Cotton Mill Workers.*

The carders have an organization in Augusta with 80 members. They work 10 hours a day, with a minimum wage of 82 cents.

The mule spinners have organizations in Augusta and Lewiston, with a membership of 120. They work 10 hours a day, with a minimum wage of \$2.25.

The weavers have an organization in Augusta with 100 members. They work 10 hours a day, with no minimum wage as yet.

The slasher tenders have an organization in Biddeford with 25 members. They work 10 hours a day, with a minimum wage of \$2.00.

The loomfixers have organizations in Augusta and Biddeford with a membership of 52. They work from 10 to 11 hours, with a minimum wage of \$2.00.

*Clothing Makers.*

The garment workers have an organization in Norridgewock (South) with 72 members. They work 9 hours a day, with a minimum wage of \$1.25.

The journeymen tailors have an organization in Bangor with 20 members.

The suspender workers have an organization in Augusta with 8 members. They work 9 hours a day, with a minimum wage of \$1.75.

*Granite Workers.*

The quarrymen have organizations in Bluehill (East), Hallowell, Jay (North), Mount Desert (Hall Quarry) and Waldoboro, with a membership of 252. They work 8 hours a day, with a minimum wage from \$1.60 to \$1.80.

The granite cutters have organizations in Bluehill, Calais (Red Beach), Frankfort, Hallowell, Hurricane Isle, Jay (North), Lewiston, Norridgewock (South), Portland, St. George (Clark Island, South Thomaston (Spruce Head), Stonington, Vinalhaven and Waldoboro, with a membership of 1,138. They work 8 hours a day, with a minimum wage from \$2.80 to \$3.00.

The paving cutters have an organization in Hurricane Isle with 19 members. They work 9 hours a day, with a daily wage of \$2.50.

*Iron Workers.*

The blacksmiths have an organization at Rumford (Falls) with 10 members.

The sheet metal workers have an organization in Bangor with 18 members. They work 9 hours a day, with a minimum wage from \$1.75 to \$2.25.

The foundry workers have an organization in Brewer (South) with 9 members. They work 9 hours a day, with a minimum wage ranging from \$1.33 to \$2.00.

The iron moulders have organizations in Bangor, Bath, Biddeford, Lewiston and Portland, with a membership of 307. They work 9 and 10 hours a day, with a minimum wage from \$2.50 to \$3.00.

The stove mounters have an organization in Bangor with 20 members. They work 9 hours a day, with a minimum wage of \$1.75.

The machinists have organizations in Bangor, Bath, Portland and Rumford (Falls), with a membership of 178. They work 10 hours a day, with a minimum wage of \$2.00.

#### *Laborers.*

There are laborers' protective unions in Jay (Chisholm) and Skowhegan, with a membership of 532. Laborers work from 9 to 12 hours a day, with a minimum wage from \$1.50 to \$1.65.

There are federal labor unions in Augusta, Bangor, Gardiner, Hallowell and Millinockett, with a membership, outside of Hallowell, of 272. They are made up from various trades and the members work 9 to 10 hours a day, with minimum wages varying from \$1.66 for teamsters to \$4.00 for longshoremen.

#### *Printers.*

The printers have unions in Augusta, Bangor, Biddeford, Lewiston and Portland, with a membership of 229. They work 8 to 10 hours a day, with a minimum wage from \$10.00 to \$14.00 per week.

The printing pressmen have an organization in Portland with 50 members.

#### *Pulp and Papermakers.*

The pulp, sulphite and paper mill workers have organizations in Augusta, Brewer (South) and Rumford (Falls), with a membership of 964. They have varying hours, some working 10 hours by day and 12 hours by night, while others work 11 hours by day and 13 hours by night. Three mills, namely, the S. D. Warren at Cumberland Mills, the Hollingsworth and Whitney at Winslow, and the Great Northern at Millinockett, work their crews in 8 hour shifts, making practically an 8 hour day. The minimum wage ranges from \$1.50 to \$1.65.

The paper makers have organizations in Brewer (South), East Livermore (Livermore Falls), Gardiner, Millinockett, Orono and Rumford (Falls), with a membership, outside of Orono and Rumford (Falls), of 352. They work from 9 to 12 hours a day, with a minimum wage from \$1.00 to \$3.50.

The paper bag mill workers have an organization in Rumford (Falls), membership not separately stated.

The paper bag machine tenders have an organization in Rumford (Falls), membership not separately stated.

#### *Railway Employes.*

The railway conductors have organizations in Bangor and Portland, with a membership of 180.

The locomotive engineers have organizations in Bangor, Brownville (Henderson), Houlton and Portland, with a membership of 316. They have generally no regular hours, their minimum wage being \$3.50 per day.

The locomotive firemen have organizations in Bangor, Brownville (Henderson), Houlton and Portland, with a membership of 379. They work 11½ hours a day, with a minimum wage from \$1.50 to \$2.00.

The railroad trainmen have organizations in Bangor, Brownville (Henderson), Houlton, Portland and Waterville, with a membership of 698. They work 10 hours in yard and 11 on train, with a minimum wage from \$1.75 to \$3.10.

The railroad telegraphers have an organization in Bangor with 300 members. They work 8 hours a day, with a minimum wage of \$1.53.

The car inspectors and repairers have an organization in Portland with 50 members.

The railway freight handlers have an organization in Portland with 50 members.

The car workers have an organization in Waterville with 110 members. They work 10 hours a day, with a minimum wage of \$1.25.

The local union of Brothers (electric railway workers) have an organization in Portland, membership not stated.

#### *Shipbuilders, Longshoremen and Sailors.*

The ship carpenters have an organization in Bath with 50 members. They work 10 hours a day in summer and 9 in winter, with a minimum wage of 25 cents an hour.

The boilermakers and iron shipbuilders have an organization in Bath with 175 members. They work 10 hours a day, with a minimum wage from \$2.50 to \$3.00.

The sailmakers have organizations in Bath and Thomaston, with a membership of 46. They work 9 hours a day, with a minimum wage of \$3.00.

The riggers have an organization in Bath with 35 members. They work 10 hours a day in summer and 9 in winter, with a minimum wage of 30 cents an hour.

The longshoremen have organizations in Bangor and Portland, with a membership of 788. They work generally by the hour, the wage being 30 cents an hour for day work and 40 cents an hour for night work. In Portland 60 cents an hour is the wage for trimming grain.

The Atlantic seamen have organizations in Bangor and Portland, membership not stated. They work 12 hours at sea and 9 hours in port, with a minimum wage of \$25.00, \$30.00 and \$35.00 per month, according to tonnage.

#### *Stationary Engineers and Firemen.*

The stationary engineers have an organization in Rumford (Falls), with 15 members.

The local firemen have organizations in Gardiner, Madison, Millinocket and Rumford (Falls), with a membership of 183. They work from 8 to 12 hours a day, with a minimum wage from \$1.50 to \$2.25.

#### *Team Drivers.*

The team drivers have organizations in Bangor, Gardiner, Portland and Rumford (Falls), with a membership, outside of Gardiner, of 215. They work 9 hours a day, with a minimum wage from \$1.50 to \$1.75.

The cab drivers have an organization in Augusta with 37 members.

#### *Wood Workers.*

The sawmill employes have organizations in Brewer (South) and Orono, with a membership, outside of Orono, of 250. They work 10 hours a day, with a minimum wage of \$2.50.

There is a millmen's union of carpenters and joiners in Portland with 50 members. They work 10 hours a day.

The millwrights and woodworkers have organizations in Bangor and Rumford (Falls), with a membership, outside of Bangor, of 12.

*Miscellaneous Trades.*

The bakers and confectionery workers have an organization in Portland with 60 members. They work 10 hours a day, with a minimum wage of \$2.00.

The barbers have organizations in Augusta, Bangor, Portland and Rumford (Falls), with a membership of 117. They work generally 65 hours per week, with a minimum wage from \$10.00 to \$12.00.

The boot and shoemakers have organizations in Auburn, Bangor, Portland and Sanford (Springvale), with a membership, outside of Portland, of 290. They work 10 hours a day, with a minimum wage of \$1.50.

The cigarmakers have organizations in Bangor, Biddeford, Lewiston, Portland and Rockland, with a membership, outside of Rockland, of 142. They work 8 hours a day, with a minimum wage of \$2.50.

The electrical workers have an organization in Bangor with 12 members. They work 9 hours a day, with a minimum wage from \$1.00 to \$2.00.

The retail clerks have organizations in Augusta, Lewiston, Portland and Rumford (Falls), with a membership of 340. They work 10 hours a day, with no fixed minimum wage as yet.

## UNIONS AND MEMBERSHIP BY TOWNS.

In 35 different cities and towns in the State we find organized labor unions, ranging from 1 to 27 in a town. The number of unions in each of the towns, together with their combined membership, so far as we have been able to ascertain, is as follows:

- Auburn, 1 union with 190 members.
- Augusta, 15 unions with 802 members.
- Bangor, 26 unions with 1,936 members.
- Bath, 9 unions with 553 members.
- Biddeford, 9 unions with 372 members.
- Bluehill, 2 unions with 68 members.
- Brewer, 4 unions with 339 members.
- Brownville, 3 unions with 108 members.
- Calais, 1 union with 48 members.
- East Livermore, 1 union with 67 members.

Eden, 4 unions with 422 members.  
 Frankfort, 1 union with 150 members.  
 Gardiner, 7 unions with 338 members.  
 Hallowell, 3 unions with 244 members.  
 Houlton, 3 unions with 287 members.  
 Hurricane Isle, 2 unions with 128 members.  
 Jay, 3 unions with 476 members.  
 Lewiston, 10 unions with 671 members.  
 Madison, 2 unions with 92 members.  
 Millinocket, 3 unions with 161 members.  
 Mount Desert, 1 union with 37 members.  
 Norridgewock, 2 unions with 80 members.  
 Orono, 2 unions.  
 Portland, 27 unions with 2,629 members.  
 Rockland, 1 union.  
 Rumford, 16 unions with 1,400 members.  
 Saint George, 1 union with 46 members.  
 Sanford, 1 union with 50 members.  
 Skowhegan, 4 unions with 312 members.  
 South Thomaston, 1 union with 68 members.  
 Stonington, 1 union with 74 members.  
 Thomaston, 1 union with 25 members.  
 Vinalhaven, 1 union with 135 members.  
 Waldoboro, 2 unions with 190 members.  
 Waterville, 4 unions with 331 members.  
 Total, 174 unions with 12,829 members.

This is really the membership of 164 unions, as 10 have failed to report.

#### COMPARATIVE GROWTH OF UNIONS.

While trade unions, particularly among granite workers, have existed in Maine for a long time, there had been no attempt at a general organization until within a comparatively few years.

In our first attempt at an investigation of trade unionism in Maine in 1902, we learned the location of 140 unions in the State, which were mentioned in our report for that year. Out of the number mentioned, full or partial returns were received from 115 giving a membership of 9,229, an average of 80 to a union.

The investigation the present year has disclosed the location of 174 unions, 164 of which have reported a membership of



12,829, an average of 78 to a union. This does not necessarily indicate a fall off in the average membership of the unions, from the fact that this year's report contains many newly formed unions with but few members, and the further fact that the report of 1902 contained practically all of the larger unions in the State. An examination as to membership of the unions reporting for both years will, on the whole, show an increase in the unions so reporting.

Our estimate last year was that there were then in the State about 150 trade unions with a membership of from 10,000 to 12,000. This year we have the location of 174 unions, and have received returns as to membership from 164. If the 10 delinquent unions average the same as those heard from, the total membership of the 174 would foot up 13,609.

So far as we have been able to ascertain, only 2 unions have disbanded during the year. A papermakers' union in Westbrook, organized October 6, 1902, disbanded after an existence of about six weeks. A federal labor union in Foxcroft, organized April 4, 1902, with a membership of only 11 at our last report, on account of the removal of the most of its members, also surrendered its charter.

#### REQUESTS, DIFFERENCES AND STRIKES.

##### *Augusta.*

The Bricklayers, Masons and Plasterers' Union made an agreement with the Boss Masons' Association, for the year, in regard to hours, wages, etc., satisfactory to both parties. The bricklayers and masons of Augusta have an arbitration committee, consisting of three members of the union, who meet with a committee of three from the Boss Masons' Association, and adjust all differences.

The Loom Fixers' Union asked for a reduction in the number of hours of labor per week, and a reduction from 62 hours to 60 hours per week was made.

The Mule Spinners' Union reports a suspension of work from August 1 to October 5, partly on account of repairs and partly owing to the high price of raw material.

The Pulp, Sulphite and Paper Makers' Union asked for an 8 hour day, but the request has not yet been granted.

The Typographical Union asked that the number of hours of labor per week be reduced and the result was a reduction from 60 hours to 54 hours labor per week.

*Bangor.*

The Bricklayers, Masons and Plasterers' Union asked for an increase of 33 cents per day, and it was granted without objection.

The Carpenters and Joiners' Union asked for an increase in wages of 50 cents per day, but compromised at 25 cents.

The Cigarmakers' Union secured a change from weekly wages to piece work for cigar packers, thus increasing their pay nearly 100 per cent.

The Painters, Decorators and Paperhangers' Union asked for a minimum wage of \$2.50 for a 9 hour day, but compromised at \$2.25 for a 9 hour day.

The Typographical Union asked for an increase of wages for members on the morning paper. After several conferences between managers and members of the union an increase of \$1.00 a week per man was granted and accepted.

*Bath.*

The Bricklayers, Masons and Plasterers' Union asked for an increase of 25 cents per day, and it was granted without objection.

*Brewer (South).*

On September 1, 1902, the Sawmill Employes' Union asked for a 10 hour day, and in about eight days it was granted, thus reducing the hours of labor from 11½ to 10 hours per day.

*Eden (Bar Harbor).*

In the latter part of April, 1903, the labor organizations of the carpenters, masons and painters at Bar Harbor united in requesting from contractors an 8 hour day instead of the 9 hour day then prevailing, also an increase in the daily wage. No attention was paid to this request by the contractors; therefore, on July 1, 1903, the members of the three unions named voted to

strike. The effect was to stop all building operations at this noted summer resort.

After many fruitless attempts to settle the difficulty the essential points of difference were finally referred to a committee of arbitration chosen by employers and employes. The committee consisted of five gentlemen, three of whom, namely, David B. Ogden of New York, Arthur D. Addison of New York and Bishop William Lawrence of Massachusetts, were summer residents or tourists, while the other two, namely, Rev. Sylvanus L. Hanscom and Charles F. Paine, were residents of Bar Harbor. The five gentlemen forming the committee were accepted by the employers and the workmen, and both sides expressed the greatest confidence in their wisdom and impartiality.

After an exhaustive investigation the committee made the following report:

"To the representatives of the Builders' association of Bar Harbor, the B. Masons I. Union, No. 4 of Maine, the U. B. Carpenters and Joiners of America, No. 459, and local union No. 142, B. of Painters, Decorators and Paper Hangers of America,

Gentlemen:

"We accepted your appointment to act as a board of arbitration, under terms of agreement by which all matters now in dispute between the Builders' association and the unions were to be submitted to us. We met on the evening of July 16, for the purpose of hearing first the representatives of the unions in regard to their demands.

"At that session and before the hearing began, the unions stated that they did not understand that the question of discrimination, that is, whether or not union men should work with non-union men, was before us for decision, although we were of opinion from the papers submitted to us that this matter was in dispute and therefore within the terms of arbitration.

"Thereupon the representatives of the masons' union said that the National Masons' union by its constitution would not allow this question to be arbitrated upon; and that it was a part of their fundamental constitution that union men should not work with non-union men. The representatives of the carpenters' and painters' union said that although this was not in their constitution, they would have to take the same position as the masons. As the Builders' association insisted that this question of discrimination was an essential element in the question in dispute, and must therefore be arbitrated upon with the other differences, we were unable to proceed under the agreement, and we dissolved as a board of arbitration.

"It was then suggested and agreed to by your representatives and us, that we should hear statements of both sides and make a report for publication, giving our opinion as to the merits of the controversy, and stating what would be a fair adjustment thereof. This task we have undertaken in the hope that the public, having before them the facts as we find them, may be in the position to bring to bear their all powerful influence to effect a just settlement.

"But before we proceed to discuss the matter in its other aspects, we desire to express our entire condemnation of the principle of discrimination for or against any man, by reason of his belonging or not belonging to a union, whether such discrimination be on the part of employer or on the part of the employed. The union of men engaged in the same craft is in itself worthy of the cordial support of public opinion. By it the wants and just demands of the man can find expression and ultimate fulfillment. It is only when these unions employ unfair or unrighteous means either to compel unwilling men to join their ranks or to enforce their demands that they merit censure.

"A discrimination against non-union men by unions, that is to say, the refusal of the unions to permit their men to work on any job on which non-union labor is employed, is claimed by the unions to be necessary for their existence, and to be merely the exercise of the undoubted right of every man to work where and for whom and upon whatever terms he may please. Practically this discrimination is used as the means of compelling all to join the union ranks.

"Now it is our opinion that this discrimination can not be justified on the ground of either expediency or right. We believe the unions would attain a much higher place in the public regard, and would therefore be far more influential, if their ranks were filled by men who joined because of the positive benefits which they secured thereby, rather than because the unions had caused them injury and would continue to cause them injury until they reluctantly yielded and became members of the organization which oppressed them. We also believe that the abstract rights of men can be exercised unrighteously, and that they are used unrighteously when used to deprive another of the power to exercise the same rights. Every man has undoubtedly the right to refuse to work for any particular employer, but if he exercises that right for the purpose of oppressing a fellow laborer, so as to compel him to do that which he desires not to do, his conduct is tyrannical and unfair.

"The most weighty charge against trusts is that they use their legal rights to crush opposition to their will, their wealth and influence insuring their success. The representatives of the masons' union admitted that case to be in strict analogy to that of the unions, and avowed that the purpose of the unions in practicing discrimination was to create a labor trust.

"As has been said, the masons of Bar Harbor are associated with the National union, which by its fundamental law prohibits the submission of this question to arbitration, and also prohibits the making of any contracts limiting the conditions under which discrimination shall be exercised, unless they are approved by some person or body having general jurisdiction over this subject throughout the United States.

"In case of the Carpenters and Painters' union, however, there does not seem to be any such law controlling the action of the local unions; but they make common cause in this respect with the masons.

"While it would seem to be impossible to establish an independent masons' union in this place which shall be free from this degrading subservience to a distant body in a matter of influencing or involving a question of right and wrong, it would not be too much to hope that by influence of the local unions throughout the country, the organic law might be changed in this respect.

"The American people believe in fair play. In our opinion, unions which refuse to allow their men to work with non-union men can never command the full sympathy of the public or their support, any more than can employers who discriminate against union men. The cause of the laborer is in the people's mind too good to be degraded by methods which, if exercised by the employer, the people condemn. We do not believe that public sympathy or support will ever be extended to a strike which is caused by the employment of non-union laborers, or has for its object their exclusion from any particular job.

"Turning now to the other points under consideration, let us take up the subject of wages. The unions desire the establishment of a minimum wage of \$3.50 a day for masons and \$3.00 a day for carpenters and painters; eight hours to constitute a day's work. At present there is an agreement between the Builders' association and the unions under which the minimum wage for masons is \$3.00 a day and for carpenters and painters, \$2.50 a day; nine hours to constitute a day's work.

"In support of their claims the unions presented the following statement as to masons' wages: In Massachusetts the eight-hour day exists in 23 cities and towns, in 16 of which the rate of wages is 50 cents an hour, in six others, 45 to 47½ cents, while in one section of Boston it is 55 cents. In Connecticut the eight-hour day exists in nine cities and towns, with wages running from 45 to 50 cents an hour. In Rhode Island the same conditions prevail in Providence, Newport and Pawtucket.

"In the State of Maine, the record is: Lewiston, eight hours at 40⅝ cents; Portland, eight hours at 44 cents; Bath, eight hours at 40½ cents; Augusta, eight hours at 37½ cents. We have fully considered the statements furnished us by the Builders' association as to the comparative cost of building here and

elsewhere, and the explanation suggested by them and by the unions, and are of the opinion that there is no adequate reason why the workmen in Bar Harbor should not receive higher wages than they are now paid, while the cost of living and the fact that much of the work here is done upon buildings erected not for purposes of gain or business but purely for pleasure makes it unjust to refuse them such increase.

"It will be noticed that the unions claim not only a uniform raise in the scale of minimum wages of 50 cents a day for masons, carpenters and painters, but also that eight instead of nine hours should constitute a day's work, and over time be paid for at one and one-half times minimum rate per day.

"About a year ago the minimum wage system was first introduced into the town. It appears that hardly any of the mechanics receive more than the minimum wage, although it is conceded that many of them are worth more while many of them are worth less.

"The Builders' association seems to have adopted the theory, in the practical workings of which the mechanics have acquiesced, that the lower rate paid to the better workmen offsets the higher rate paid to the poorer workmen. This of course makes the minimum wage system equivalent to the uniform wage system. There are grave objections to either of these systems, but they seem to have been adopted so largely as to have become imbedded in the labor system of today and cannot probably be changed. At all events the minimum wage system is now established in the town. We do not think, for the present at least, it would be wise to change it. We think from the evidence before us that the present rate of wages paid to the three trades which are represented before us is inadequate, but we do not think the rate of increase should be as great as is asked for by the unions.

"There is no doubt in our minds that, so far as the mechanic is concerned, his condition is better, physically, morally and mentally, where working eight hours a day, and that should be nominally a day's work. Over time should be paid for at a greater rate, if only for the purpose of discouraging the use of the longer day. It is in evidence before us that so far as concerns working during the short days of the year, which is the busy season for all contractors except the painters, it is not possible for these to get more than eight hours of daylight to work. The painters, who are the last men upon a job, can work during most of their busy season nine hours. The change, therefore, from a nine to an eight-hour system, would not affect them; and as their work, which is the last to be done on the interior of the building, is usually rush work, it would seem as if the interest of the case required that their rate for over time be less than in the case of other contractors, in which the over time is not usu-

ally, necessary, if the proper estimates have been made beforehand of the period necessary for the completion of the job.

"It is our opinion, arrived at after much consideration, that the minimum wage of the mason, which is now \$3.00 for nine hours, should be raised to 40 cents an hour for the first eight hours, and 50 cents an hour for overtime; that the wage of the carpenter, which is now fixed at \$2.50 per day, should be raised to \$2.75 for eight hours, extra time to be compensated at the rate of 40 cents an hour; that the minimum painters and decorators' wages, now fixed at \$2.50 per day, should be raised to \$2.75 for eight hours, extra time to be paid for at the rate of 35 cents an hour. The union asked that a regular weekly pay day be established by each contractor. This claim on the part of the unions seems to us to be fair and should be granted. Men laid off or discharged should receive their pay without delay. Men claim that the work on certain specified holidays, Christmas, Memorial Day, Fourth of July and Labor Day, should be paid for at double time, and that work on Sunday should be prohibited unless human life or property is in danger. This request seems to be reasonable and should be granted. In view of our recommendations that the hours of labor should be shortened and the wages raised, it seems to be right that the unions recognize only excellent laborers as journeymen.

"To these recommendations we desire to add that, in our judgment, any arrangement which is now made between the Builders' association and the unions should last for a period of not less than two years. It is of the utmost importance to the prosperity of this place that the labor conditions should be stable and not liable to change. It is the natural tendency on the part of every human being, when the time arrives at which he may make a new adjustment of his relation with his employer, to seek to obtain some greater advantage than he enjoyed before. The longer the period for which adjustment can be made, the less likely it is that controversy should rise. Of course there are other dangers involved in making contracts for a long period, but it does not seem to us at all likely that there will be any such changes in the conditions at Bar Harbor as will render an agreement for two years unfair at any period of its duration.

"It has appeared in the course of our investigation that it is the custom through New England and perhaps in other states for contractors doing a job by the day's work, unless special commission on the cost of the work was agreed upon, to charge the labor of certain men at more than the workmen actually receive. Thus if a mason receives \$3.00 a day for work done for the contractor, the customer is charged \$3.50. This practice is so well established that, although it seems objectionable in theory, it would probably be hard to have it changed.

"Unfair contractors may and perhaps do charge for the labor of apprentices the sum equal to that paid to a competent

mechanic with the addition of their own profit, and then the customer, finding the labor charged at a certain figure on the bill rendered him, is under the impression that these are the actual wages received by the mechanic, and thus is spread abroad in the country the idea that the mechanic is much better paid than he actually is.

"Of course the matter is in the hands of the customers. They can insist in all cases, on the work done for them by the day by contractors, that the contractors' compensation should be a percentage of commission upon the total cost of work, and that their charges showing actual payment of the workmen should be rendered with the accounts.

"In closing we desire to express to the gentlemen who attend before us our appreciation of the fairness with which they have urged their point. We are very much gratified to find that between the contractors and the unions there appears to be on the whole a feeling of good will and desire to do that which is fair. If our efforts shall result in an adjustment of the differences between them and a satisfactory scheme of wages and hours, we believe we shall have done a great service to the community.

"Yours respectfully,

"DAVID B. OGDEN, *Chairman*,

"ARTHUR D. ADDISON,

"SYLVANUS L. HANSCOM,

"WILLIAM LAWRENCE,

"CHAS. F. PAINE, *Secretary*.

"Bar Harbor, Me., July 23, 1903."

The conclusions at which the committee arrived were accepted by both parties to the controversy, and after about a month's continuance the strike was declared off.

#### *Gardiner.*

The Carpenters and Joiners' Union asked for a reduction of working time to 9 hours a day, but compromised on 10 hours a day for 5 days and 5 hours on Saturday from June 1 to October 1, and 9 hours on Saturday for the rest of the year.

The Papermakers' Union made a request for shorter hours and the request was granted. The hours are now 10 for four workers and 9 for day help.

The Painters, Decorators and Paperhangers' Union agitated the question of hours of labor and the matter was settled by mutual agreement at 9 hours a day.



*Houlton.*

The Brotherhood of Locomotive Engineers, through their representatives, arranged a schedule of hours and wages with the general manager of the Bangor and Aroostook railroad, which was mutually satisfactory.

The Brotherhood of Locomotive Firemen also arranged, with the general manager, a satisfactory schedule of hours and wages.

The Brotherhood of Railroad Trainmen had a disagreement with the railroad management in regard to wages and hours of labor, but after one week's conference the matter was settled amicably.

*Hurricane Isle.*

The Paving Cutters' Union asked for an increase of wages, and was granted an increase of \$2.50 per thousand.

*Lewiston.*

On October 1, 1902, the Bricklayers, Masons and Plasterers' Union notified the contractors that after April 1, 1903, they should demand an 8 hour day with the same pay as before. No answer was returned, but all contractors dropped into line at the time specified.

*Madison.*

There was a shut down of about three weeks in the Great Northern Paper Company's mill at Madison, the dispute being over hours of labor, the men asking for an 8 hour day, as at Millinocket. The men returned to work, leaving the question of hours of labor to be decided in the future.

*Norridgewock.*

On June 1, 1903, the Garment Workers' Union requested an increase of 25 per cent. in wages. This was refused. They then offered to accept a 15 per cent increase. This was also refused. The garment workers then struck and were out one month, when the matter was compromised by the contractors granting the 15 per cent increase.

*Orono.*

On April 1 the paper makers at Basin Mills, Orono, went out on strike, because the Orono Pulp and Paper Company would not grant a 65 hour week instead of a 78 hour week. The mill was manned by non-union help after some delay, and many of the strikers obtained work in other localities.

*Portland.*

On May 1, 1903, the Bakery and Confectionery Workers' Union made a demand for shorter hours and increased wages, and both requests were granted except in one establishment. Here a strike was ordered with the result that outside help was employed. The day is now 10 hours and the minimum wage \$2.00.

On Nov. 15, 1902, the Longshoremen's Benevolent Association asked for an increase of 5 cents an hour for night work, and the request was granted with very little opposition.

The Typographical Union requested a reduction of hours of labor, which was granted, so that now the working day is 9 hours instead of 9½ hours as formerly.

*Rumford (Falls).*

On September 16 trouble arose in the mill of the International Paper Company at Rumford Falls on account of the refusal of the company to discharge a non-union man and reinstate a number of union machinists who had been discharged. The representatives of the company, at a conference with the employes, before final action was taken, maintained their right to choose their employes and explained their reason for their action in the present instance.

As the representatives of the company and the committee of the employes could not agree, a strike was ordered and 700 employes went out. There was also some trouble about overtime. The employes had been allowed time and one-half for overtime, but the company had cut them down to time and one-fourth for overtime.

On October 2 these various differences were amicably adjusted and the men went back to work. The terms of agreement have not been given out.

*Stonington.*

On January 1, 1903, the Granite Cutters' Union requested the contractors to grant fortnightly payments and 20 cents per day increase in wages, to take effect May 1. These requests were granted without opposition, so that now the daily wage is \$3.00, and pay day comes every two weeks.

## MINERAL SPRINGS IN MAINE.

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Chemically, pure water is the protoxide of hydrogen, one atom of hydrogen uniting with one atom of oxygen to form a substance differing in all its physical properties from either of its components. Water obtained by careful distillation is perfectly pure, since in this process its impurities are left in the boiler or retort, and the vapor alone passes over, condensing and forming water in its liquid state. Pure water is never found in wells, springs or rivers, rain water alone approximating to that degree of purity attained by distillation.

In this connection it is well to remember that rain water is really a distilled water. Vapor, arising from the ocean, rivers and lakes, forms the clouds which yield rain. We may, for most practical purposes, consider the water falling from the clouds to be free from impurities or any foreign substance, and yet, chemically, rain is far from pure, having absorbed more or less impurity from the atmosphere. After rain has fallen on the earth it percolates through the soil, and, dissolving various earthy salts, finds its way to our wells and springs. Owing to the great abundance of these salts in some localities the solution is much stronger than that in other localities; and when they are present in quantities sufficient to decompose the soap used in washing, we call the water hard. When the solution becomes so strong as to be perceptible to the taste, it is called mineral water. The use of this term has become very general, although by its acceptance we seem entirely to overlook the fact that all water is a mineral, just as truly as common lime.

From the earliest times, springs from which flows water charged with earthy salts have attracted much attention and have obtained different degrees of celebrity as remedial agents. In many cases the use of such water has produced considerable relief in some diseases and cures have been thought to be attributable alone to the medicinal spring.

## LIST OF MINERAL SPRINGS.

Nature has been very generous to the State of Maine in the distribution of mineral and medicinal springs, as will be seen by the following list. It is not claimed that the list includes all the mineral springs in the State, but only those that have been proved to possess healing virtue by the use of their waters.

*Androscoggin County.*

Crystal mineral spring in Auburn.  
 Field mineral spring in Auburn.  
 Lake Auburn mineral spring in Auburn.  
 Mount Hozee mineral spring in Auburn.  
 Pejepscot mineral spring in Auburn.  
 Diamond mineral spring in Greene.  
 Glenrock mineral spring in Greene.  
 Purity mineral spring in Greene.  
 Switzerland mineral spring in Greene.  
 Highland mineral spring in Lewiston.  
 Hillside springs in Lewiston.  
 Windsor mineral spring in Lewiston.  
 Minot mineral spring at West Minot in Minot.  
 Highland mineral spring in Poland.  
 Keystone mineral spring at East Poland in Poland.  
 Poland mineral spring at South Poland in Poland.  
 Polsko mineral spring at South Poland in Poland.  
 White Oak Hill mineral spring in Poland.  
 Sabattus mineral spring in Wales.

*Aroostook County.*

A mineral spring in New Limerick.

*Cumberland County.*

Eight mineral springs in Bridgton.  
 Paradise mineral spring in Brunswick.  
 Underwood mineral spring at Falmouth Foreside in Falmouth.  
 A mineral spring in Gorham.

Bailey's Island mineral spring on Bailey's Island in Harpswell.

Centennial mineral spring in New Gloucester.

Sabbath Day Lake mineral spring in New Gloucester.

Pownal mineral spring at West Pownal in Pownal.

Wilson mineral spring at North Raymond in Raymond.

Scarboro mineral spring in Scarboro.

Westbrook mineral spring in Westbrook.

*Franklin County.*

Carrabassett mineral spring in Jerusalem township.

*Hancock County.*

Bluehill mineral spring in Bluehill.

Dirigo mineral spring in Bluehill.

Three mineral springs in Brooksville.

Ishka mineral spring in Hancock.

*Kennebec County.*

Togus mineral spring at Togus in Chelsea.

Forest mineral spring and several others in Litchfield.

Ticonic mineral spring in Winslow.

*Oxford County.*

Three mineral springs in Bethel.

Fryeburg mineral spring in Fryeburg.

Mount Hartford mineral spring in Hartford.

Mount Zircon mineral spring in Milton plantation.

Oxford mineral spring in Oxford.

West Paris mineral spring at West Paris in Paris.

Roxbury mineral spring in Roxbury.

Waterford mineral spring at North Waterford in Waterford.

*Penobscot County.*

Oak Grove mineral spring in Brewer.

Dixmont mineral spring at North Dixmont in Dixmont.

Ware mineral spring in Lee.

*Piscataquis County.*

Katahdin Iron Works mineral spring at Katahdin Iron Works.

*Sagadahoc County.*

Richmond mineral spring in Richmond.

Pine mineral spring in Topsham.

*Somerset County.*

Rocky Hill mineral spring in Fairfield.

Glenwood mineral spring in St. Albans.

*Waldo County.*

Stockton mineral spring in Stockton Springs.

Thorndike mineral spring in Thorndike.

*Washington County.*

Addison mineral spring in Addison.

Utona mineral spring in Eastport.

Lubec mineral spring in Lubec.

A saline mineral spring near the head of South bay in Lubec.

Machiasport mineral spring in Machiasport.

*York County.*

A mineral spring in Biddeford.

Great Boiling spring in Dayton.

Cold Bowling mineral spring in Limington.

Newfield mineral spring at West Newfield in Newfield.

Pine Point mineral spring in Old Orchard.

Seal Rock mineral spring in Saco.

Indian Hermit mineral spring in Wells.

Wawa Lithia mineral spring at Ogunquit in Wells.

The above list enumerates 81 mineral springs, counting only one in Litchfield, but there are others, some of which are in the wild land region of the State, whose waters have not as yet been thoroughly tested.

## CLASSIFICATION OF MINERAL SPRINGS.

Mineral springs may be classed, according to temperature, into cold and thermal. We have no thermal or warm springs in our State, the popular name of boiling springs having been given to such as have a small current of air passing through them, causing a peculiar bubbling resembling ebullition. The mineral springs of Maine are all cold, and although they vary slightly in temperature, none are so warm as to be considered thermal.

Mineral springs may be divided also into three classes, according to their prevailing ingredient, as follows: sulphureous, chalybeate and saline.

Sulphureous springs may be recognized by the peculiar odor of one of their constituents, sulphuretted hydrogen. The odor is the same, although in a less marked degree, as that attending the decomposition of eggs. In many chronic skin diseases the water from these springs, used externally and internally, often produces beneficial effects. The celebrated Togus spring in Chelsea may be assigned to this class. A mineral spring in Bethel near Sparrowhawk hill belongs to the same class. It derives its sulphuretted hydrogen from a bed of decomposing pyrites in the vicinity. There is said to be a mineral spring in the town of New Limerick, Aroostook county, belonging to this class. The springs at West Newfield, Westbrook, Katahdin Iron Works and one of those at Wells, are sulphureous. There is also a spring at West Paris that possibly belongs to this class, the odor from it being so pronounced as to be apparent several yards away.

Chalybeate springs are those whose waters are impregnated with salts of iron. These are formed by the decomposition of iron pyrites, which are composed of two atoms of sulphur and one atom of iron. Around the sides of such springs, along the rills running from them, and upon twigs and leaves in the water we find a deposit of peroxide of iron, which is sometimes so abundant in solution as to tinge the water. There is a chalybeate spring in West Bethel at the base of Anasagunticook mountain. There is a mineral spring in the same town near the village that might be classed as sulphated chalybeate. There are



also chalybeate springs at North Waterford, Lee, Dixmont and Topsham.

The saline springs are those holding in solution a large quantity of chloride of sodium or common salt. There is a spring of this kind in Lubec near the head of South bay, the analysis of the water of which shows 156.83 grains of chloride of sodium in a standard gallon, besides 88.22 grains of other salts, also one in Scarboro and one in Machiasport. The Mount Zircon spring in Milton plantation is classed as saline. Its water is colorless, transparent and of great purity. The water from the saline springs is recommended for kidney diseases.

#### DESCRIPTION OF MINERAL SPRINGS.

We shall not attempt to describe in detail every mineral spring in Maine, but shall confine ourselves to those springs that have become somewhat noted by reason of the sale of their waters to people of our own and other states.

#### *Addison Mineral Spring.*

This spring is located in the town of Addison, Washington county, about a mile from Addison village. The analysis shows sulphate of potash, sulphate of soda, sulphate of lime, chloride of sodium, bi-carbonate of lime, bi-carbonate of magnesia and bi-carbonate of iron present in the water.

The spring is sulphureous, there being a distinct odor of sulphuretted hydrogen when the water is held near the nose. The water is undoubtedly a remedy for constipation and consequent diseases, as well as for humors, neuralgia and rheumatism. Owing to its isolated location the water from this spring has remained less known than that from other springs, but the building of the Washington County railroad has brought it into notice and the water from this truly valuable spring will now take its merited place among our mineral waters. The nearest station on the Washington County railroad is at Columbia Falls, three miles distant.

*Auburn Mineral Springs.*

There are five springs in Auburn that have attained local celebrity as mineral springs, and water from some of them has been sold quite extensively. The names of the springs are as follows: Crystal spring, owned by the Crystal Spring Bottling Company; Mount Hozee, owned by the Mount Hozee Mineral Spring Company; Pejepscoot, owned by Simon M. Merrill; Lake Auburn, owned by the Lake Auburn Mineral Spring Company; and Field spring, owned by G. H. Field. The water from mineral springs in Auburn, Lewiston and Greene has been sold in large quantities as a table water in the cities of Lewiston and Auburn.

The water of Lake Auburn, from which the cities of Auburn and Lewiston derive their water supply, is as clear and pure as most spring water. With the water of this beautiful lake to draw from and so many fine mineral springs in close proximity, the people of these two cities are certainly highly privileged.

*Bailey's Island Mineral Spring.*

Bailey's island is one of the beautiful islands of Casco bay. It forms a part of the town of Harpswell and is situated southeasterly of the southern extremity of Harpswell neck. The spring is located near a little harbor known as Mackerel cove. Its capacity is about 100 gallons an hour.

The analysis shows that in 1,000,000 parts there are of silica 15 parts, of carbonate of lime 10 parts, of sulphate of lime 30 parts, of carbonate of iron 8 parts, of chloride of magnesium 5 parts, of chloride of potassium 4 parts, and of chloride of sodium 33 parts. The spring belongs to the sulphate chalybeate class and its waters are recommended as especially beneficial in purifying the blood. The spring flows into a cemented reservoir over which a house has been erected.

*Bluehill Mineral Spring.*

This spring is situated near the base of Bluehill mountain, a beautiful eminence that rises 950 feet above the sea level in the town of Bluehill, Hancock county. The spring belongs to the chalybeate class, the waters being highly charged with the car-

bonate of iron. The water is highly recommended for dyspeptic complaints and for diseases common to sedentary people.

The Bluehill Mineral Company has erected near the spring a tasty and commodious building for the use of tourists and visitors, together with an office and a large bottling establishment. This spring has been known for two hundred years, and for the past quarter of a century its waters have been sold in many of the cities of the United States. The sales are increasing rapidly, and the company is contemplating the erection of a hotel near the spring to be ready for guests during the summer of 1904. As all the surroundings are beautiful in the extreme, the locality could be developed into a famous summer resort by judicious outlay and proper advertising.

#### *Bridgton Mineral Springs.*

The town of Bridgton, Cumberland county, has no less than eight springs claimed to contain some mineral and medicinal virtues. As far as we know none of these springs have as yet become noted except locally, although they undoubtedly contain curative qualities equal to springs better known.

#### *Brooksville Mineral Springs.*

From Brooksville are reported three mineral springs, one of which is situated at the foot of Perkins mountain, on the west bank of the Bagaduce river. This is a chalybeate spring, and its waters are highly recommended for table use, also for many complaints.

#### *Forest Mineral Springs.*

These springs are located in Litchfield, Kennebec county. The springs have been known for more than a century, and it is an established fact that the Indians resorted to these waters on account of their healing virtue. The analysis shows only about 11 parts of solid matter in 1,000,000 parts of water. Hon. O. B. Clason of Gardiner has written a history of these springs which is very interesting, and he proves that the waters were renowned for their medicinal properties generations ago.

The capacity of the principal spring is about 10,000 gallons daily. The proprietors have a bottling house and other facilities

for putting up and shipping the water, which finds a ready market in Boston and the surrounding cities. The water is slightly alkaline and is said to act favorably in kidney and bladder troubles. The office of the company is in Gardiner, Maine.

*Glenrock Mineral Spring.*

Glenrock spring is situated in the town of Greene, Androscoggin county. The flow of the spring is about 15,000 gallons per day. The temperature on hottest days in summer is  $47\frac{1}{2}$  degrees. The analysis of the water discloses the following salts in the gallon:

Sodium Chloride .....	.48 grains
Potassium Sulphate .....	.42 grains
Calcium Carbonate .....	1.82 grains
Magnesium Carbonate .....	.37 grains
Sodium Carbonate .....	.27 grains
Silica .....	.33 grains
Alumina .....	.27 grains
Ferric Carbonate .....	.19 grains
Total .....	4.15 grains

A sample of this water may be seen at the spring, that has been bottled for eight years; the water is in its natural state and has never shown any signs of impurity. It is highly recommended for use in all cases of liver, kidney and bladder diseases. It is used extensively as a table water. The proprietors have a bottling house near the spring. The principal markets are the cities of Auburn and Lewiston. The water is shipped also to Massachusetts and Rhode Island.

*Great Boiling Spring.*

One of the most remarkable springs in Maine is located in the town of Dayton, York county. The following description, furnished by J. Burton Roberts, town clerk of Dayton, gives a very good idea of this natural curiosity.

"The great boiling spring referred to by you is situated on the farm owned by Samuel Hill, is about 100 rods distant from my own home, and is near the center of the town of Dayton. This

spring is of an irregular oval shape; its greatest diameter is 100 feet and its smallest, about 70 feet. The water is clear and very cold, with no perceptible odor. I am unable to say whether or not it contains any mineral properties.

"The bottom of the spring is a very fine sand which will give a peculiar grating noise under pressure of the foot when first taken from the water, but loses this peculiarity on becoming dry. There is no grit to the sand and it will not polish anything. The bottom of the spring is almost constantly in motion, or boiling, first in one place, then in another. It has an outlet to a near-by brook, through which the water flows in quite a large stream. This spring is a great natural curiosity and people come from long distances to view it."

It seemed best to place the above description of this curious spring where we have although it is not classed as a mineral or medicinal spring.

#### *Greene Mineral Springs.*

One of the mineral springs of Greene, the Glenrock, has been described on another page. In addition to the Glenrock there are three others in this town, namely, the Diamond, the Switzerland and the Purity. The market for the waters of these springs is mainly the cities of Auburn and Lewiston.

#### *Highland Mineral Spring.*

This spring is located in Lewiston, Androscoggin county, outside the limits of the city proper. It seems to belong to the chalybeate class, its analysis disclosing the following ingredients: carbonate of iron, oxide of iron, chloride of sodium, sulphate of soda, sulphate of potash, carbonate of soda, carbonate of potash and carbonate of magnesia.

Its capacity is about 14,000 gallons daily. The proprietors have erected a bottling house, and large quantities of the water are put up and sent to all parts of the United States. The principal selling office is on Fifth Avenue, New York city. The water is recommended for dyspepsia, constipation, biliousness and all forms of skin, kidney and bladder diseases.

*Indian Hermit Mineral Spring.*

This spring is located in the town of Wells, York county, not far from the site of the first garrison house built in that town for protection against the Indians. The water was prescribed by the medicine men of the aborigines to the sick people of their tribes.

The water flows from a crevice in the ledge in the side of a hill that overlooks the ocean, discharging many hogsheads daily. The hill containing this spring is said to be full of minerals of various kinds. A partial analysis of the water shows the presence of magnesia, soda, lithia, iron and silica. The water has been used extensively as a table water, and is recommended for stomach and kidney troubles, liver troubles and rheumatism.

*Ishka Mineral Spring.*

This spring is situated on the highest point of a long sand ridge in the town of Hancock, Hancock county. At the spring the sand is estimated to be 300 feet deep, the ridge at this point being 650 feet high. The sand forms a gigantic filter for the spring, which pours forth 14,000 gallons of water daily, forming a small brook which empties into the ocean one and three-fourths miles away. The water is pure, clear and soft and is said to give wonderful results in the treatment of stomach troubles and diseases of the kidneys and bladder.

This spring was first discovered by the French missionaries, and was curbed in by them with cobble stones. It afterwards became covered up and lost, but was rediscovered in 1897. As many as possible of the same pebbles were used in constructing the new curb. A spring house 26 feet square has been built, with a bottling house connected, and other additions will soon be made. The water is being sent to different points in the United States, also to Cuba.

*Lubec Mineral Spring.*

This is a chalybeate spring, located about two miles from Lubec village, near South Lubec. Its capacity is about 150,000 gallons daily, and from this spring the town receives its water supply which is carried to the village in pipes. The health of

the people has perceptibly improved since the water has been used, and some complaints have entirely disappeared. The water is so clear that a ten cent piece can be distinctly seen on the bottom of the reservoir into which the spring flows, the reservoir being 10 feet deep. The supply never fails and is more than sufficient for the use of the town at the present time.

*Machiasport Mineral Spring.*

This spring is located in the west part of Machiasport, Washington county. It is a very large, never failing spring, belonging to the saline class. We have no analysis of the water, and only know that for certain complaints the water is prescribed by the best physicians.

*Mount Hartford Mineral Spring.*

This spring is located near the top of Mount Hartford, in the town of Hartford, Oxford county. The spring is 2,700 feet above the level of the sea, and is probably the most elevated mineral spring in Maine. The water contains those mineral solutions that are considered the most beneficial, such as potassium sulphate, sodium sulphate, sodium chloride, sodium phosphate, calcium carbonate, magnesium carbonate, iron carbonate, etc.

The capacity of the spring is said to be 60,000 gallons daily. The proprietors have recently erected a fine bottling house, and they ship many carloads a year to New York, Philadelphia and other cities. Shinn & Company of Philadelphia are the selling agents, and they hold a controlling interest in the stock of the company. The water is recommended for dyspepsia, Bright's disease and all stomach and urinary troubles.

*Mount Zircon Mineral Spring.*

This spring is situated 1,000 feet above the level of the ocean, on the western slope of Mount Zircon, Milton plantation, near the town of Rumford, Oxford county. It is very pure water and must come from a great depth, as its flow is increased at the full of the moon, thus showing that it is affected by the full tides of the ocean. It was formerly known as the Moon Tide

spring. The analysis shows a slightly alkaline water of great purity. The water is recommended for all diseases of the digestive tract, kidneys and bladder. The Mount Zircon Spring Company has erected near the spring a fine bottling house with conveniences for sterilizing the bottles and for bottling the water with all of its natural gases.

The water comes boiling up through the white sand at the rate of 14 gallons a minute, the overflow forming quite a brook as it runs down the mountain side. The spring was known 35 years ago, and a large hotel was built near it, which became a famous resort for those in search of health and recreation. Later on the hotel was destroyed by fire. The company has an office in Boston and the water is sold extensively throughout New England.

The analysis shows the following salts in a standard gallon :

Silicate of Potash.....	1.11 grains
Sulphate of Soda.....	.49 grains
Chloride of Sodium.....	.10 grains
Carbonate of Iron.....	.31 grains
Total .....	2.01 grains

#### *Paradise Mineral Spring.*

This spring is located in Brunswick, Cumberland county, about one and one-quarter miles from the village. All that is claimed for it is that the water is of exceeding pureness. The analysis reveals only .996 of a grain of solid matter in a gallon of the water. Its capacity is about 12,000 gallons daily and its temperature is 43 degrees in winter and 45 in summer. It is being extensively used by pharmacists in their business on account of its purity. As a table water it has few equals. The surroundings of this spring are beautiful and it is fast becoming a favorite resort.

#### *Pine Mineral Spring.*

This spring is located in the town of Topsham, about three miles from the village, in a dense forest of pine woods. Its location is such that there is no possible chance for contamination. The spring has a flow, summer and winter, of five gal-



lons a minute, and neither the rains of spring nor the drouth of summer affect the flow. The temperature of the spring remains the same during the year. Analysis shows the following amount of salts per gallon of water:

Silica .....	.464 grains
Iron Carbonate.....	.069 grains
Calcium Carbonate.....	.272 grains
Magnesium Carbonate.....	.011 grains
Sodium Chloride.... }	.371 grains
Potassium Chloride.. }	
Sodium Sulphate.....	.034 grains
Sodium Carbonate.....	.104 grains
Total .....	<u>1.325 grains</u>

The above analysis discloses the fact that this spring is one of the purest in the State. The Pine Spring Water Company has a factory and an office situated on the corner of Maine and Dunlap streets in Brunswick. Here they carbonate the water, and also manufacture ginger ale that is considered as fine as any in the country. Pine Spring water and the products of the factory are sent to Vermont, New Hampshire, Rhode Island, Massachusetts and New York. Limited quantities of the water are shipped also to Ohio. The sales of Pine Spring water are increasing yearly.

#### *Pine Point Mineral Spring.*

This spring is located in the town of Old Orchard, near the Scarborough town line, in the midst of a dense pine grove, the nearest dwelling house being a mile distant. The capacity of the spring is about 100 gallons an hour. By analysis the water is shown to have the highest degree of purity; for this reason it is being extensively used by physicians in their practice and by druggists in manufacturing and compounding medicines. In diseases of the kidneys, bladder and stomach, it is invaluable. The water is clear and colorless and has no sediment whatever. It makes a most desirable table water.

The proprietors have a bottling house and a spring house. The spring house is built of small boulders laid up in the form of a cone and cemented. They are contemplating the erection

of a sanatorium in the near future, and for such an institution the conditions are unusually favorable. This whole region presents fine sites for summer resort cottages, hotels, etc., as it is only a short distance from Old Orchard beach.

The waters of this spring seem to be growing in favor, and the sales are increasing very rapidly, especially in the city of Portland and vicinity.

### *Poland Spring.*

The history of this wonderful spring and of the development of the old Wentworth Ricker inn, erected in 1794, to the Poland Spring house of today one of the leading summer resorts in this or any country, reads more like a romance than like absolute truth, and only goes to prove the adage, that oftentimes truth is stranger than fiction.

The land on which the spring is located first came into possession of the Ricker family in 1793, the land being purchased by Jabez Ricker, a great-grandfather of the present owners.

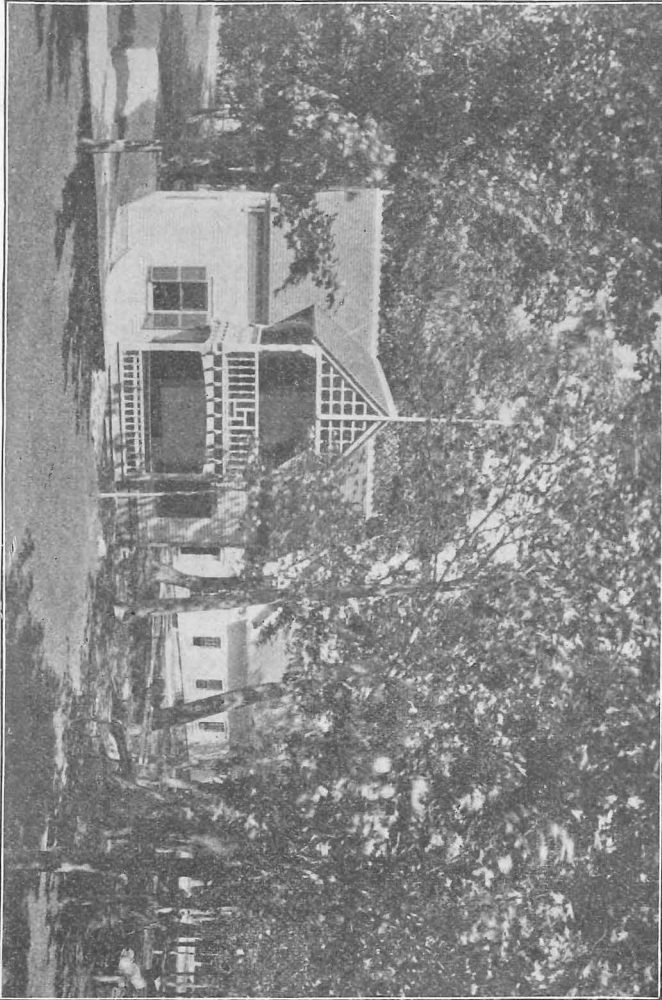
It is not the object of this sketch to give a history and description of Poland Spring as a summer resort, but to give some account of the famous spring itself, and to show why it leads all other springs in the country in the amount of sales of its health giving waters.

In 1793 the spring lay in the shadow of a virgin forest bordering a clearing made for farming purposes, and naturally was seldom used except when there chanced to be work in its immediate neighborhood. Some time in 1827, however, Wentworth Ricker, son of Jabez, was at work clearing land in the vicinity of the spring. He was at that time suffering excruciating pain from uric acid calculi, popularly known as gravel. Being so near the spring he naturally drank freely of its waters, and during this period his pains disappeared and he never suffered from the affliction afterwards.

In 1854 the late Hiram Ricker, grandson of Jabez Ricker, was suffering from dyspepsia and a feverish humor in the stomach, and consequently was drinking much water to cool this burning sensation, caused by the disease. He was directing some men who were at work on land near the spring and so drank very freely of its water. He soon experienced an unexpected relief, and, continuing its use, was soon cured of the malady.

In 1859, William Schellinger, a neighbor, suffering from a severe affliction of the kidneys, having work near the spring, took occasion to drink of its waters; and when he had finished his work in the vicinity, he still went quietly to the spring for

THE SPRING HOUSE WHERE POLAND WATER IS BARRELED.



all the water that he drank. In time he was completely cured, and lived to the ripe old age of ninety-two years.

After the cure of Mr. Schellinger, Hiram Ricker, thoroughly imbued with knowledge of the value of his possession, and with natural desire for its public promotion, visited and urged upon

Dr. Eliphalet Clark of Portland the benefit which would result from a free use of the water. The doctor finally prescribed the water in a severe and alarming disease of the kidneys and bladder. The patient was completely cured in a short time, and Dr. Clark gave the credit of the cure to Poland water.

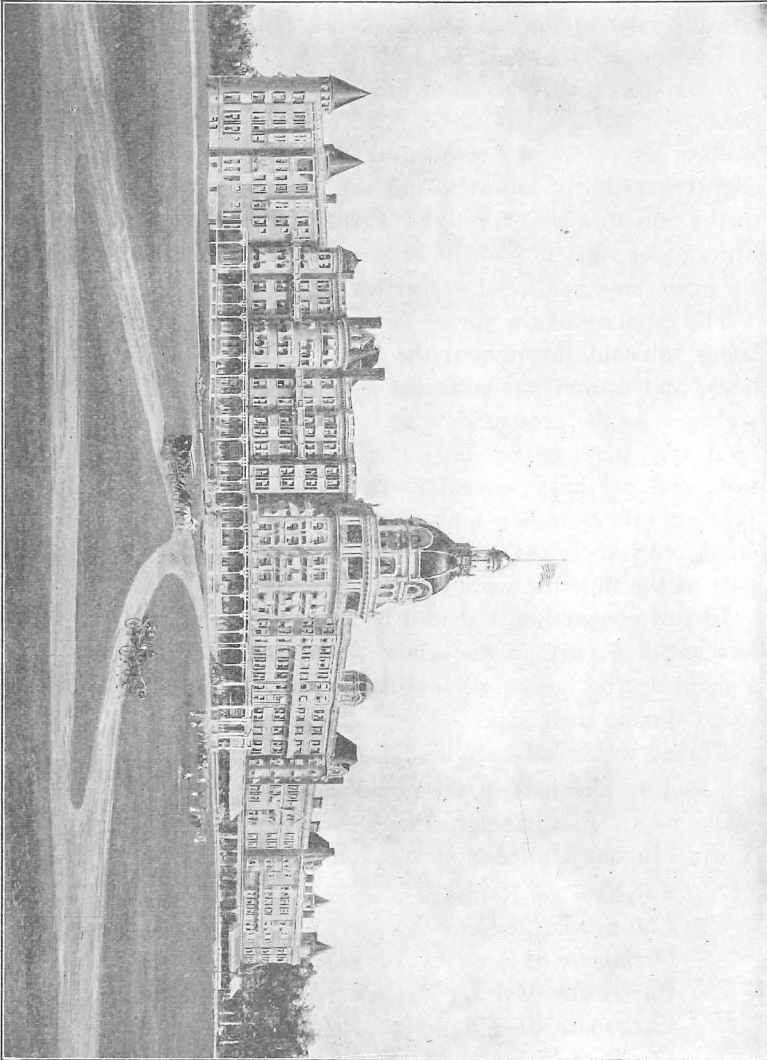
Hiram Ricker and his neighbor William Schellinger covered in the spring by a rough structure of logs in 1859, and in 1862 this was replaced by a more imposing and useful building. At this time excavations in the vicinity brought to light numerous utensils and arms of the Indians, which would seem to show that they had come to be healed by this "medicine water."

The first sales of Poland water as a curative agent took place in 1859. The first sale by the barrel was made in the autumn of that year, and within two years the sales had increased from the single three gallon demijohn, shipped by the Portland stage at the beginning, to a thousand barrels. In 1880 the sales had increased to 5,000 barrels yearly. Thereafter the increase was by great strides, until, in 1890, more water was shipped from Poland spring than from all the Saratoga springs combined. Today it is sent throughout the United States and Canada; to South America, Cuba, England, the continent of Europe, Australia, India and Egypt. Agencies are established in the leading cities in this country, the principal depot being the New York office, first opened in May, 1883. Then the yearly gross sales were about \$3,000; now this branch alone is doing a business of over \$200,000 a year.

In 1877 a barreling and a bottling house became necessary, and two buildings were erected to accommodate the increasing business. In 1882 both these buildings were made much larger and were greatly improved. Later it became necessary to build a large storehouse. Another large storehouse has already been built and work has been commenced on a spring house and a new bottling house. When finished these new buildings will be without equal in this country or on the European continent.

The apparatus now used for bottling is the very best which money can buy, the utmost precaution being taken to prevent contamination from contact with even the pure air of Poland. The bottles and corks are every one sterilized, and every cork is cut in Spain from the clearest stock that can be found, and is imported directly for the Ricker Brothers.

The spring itself is covered with glass to prevent contact with the air. The water flows from the spring into an immense granite bowl, also covered with glass. From this receptacle a



THE HOTEL, POLAND SPRING HOUSE.

large pipe extends, from which smaller pipes discharge the water directly into the bottles as it is wanted, so that practically Poland water does not come into contact with the air until it is placed on the table of the consumer.

The spring rises from a great depth, as is shown by its uniform temperature at all seasons of the year, and gushes, as the geologist tells us, from a bed of gneiss, the oldest of the sedimentary rocks, through a fissure filled with an intrusion of porphyritic rock of the old red sandstone era, which accounts for its freedom from organic matter.

From the relatively large amount of silica contained in it, Professor Bartlett has called it an alkaline silicated water. A Boston physician has testified that he was unable to get the slightest sediment from Poland water after leaving it exposed to the sun in a vial for three weeks. At the World's Fair in Chicago in 1893 it was the only water that received an award for purity and medicinal properties.

The capacity of the spring is eight gallons a minute, the flow being constant throughout the year. From 1859 to 1875 one horse and wagon was sufficient for the work of teaming at the spring. At the present time 20 horses are worked on the regular teams, hauling the water to the railroad at Lewiston Junction, and at times several extra teams are required. In the bottling and barreling houses a force of from 30 to 50 men is employed, varying at different times of year, and for the greater part of the time the work is carried on day and night.

In this connection it should be stated that hundreds of tourists spend a part or the whole of the summer season at the Poland Spring house, whose drink is almost exclusively Poland water during their stay.

Poland water has been analyzed many times, and by some of the leading chemists in the country. We present the analysis made by C. F. Chandler, Ph. D., of Columbia College, New York. In one United States gallon were found:

Sulphate of Potassa.....	.1562	grains
Chloride of Sodium.....	.2636	grains
Carbonate of Soda.....	.1333	grains
Carbonate of Lime.....	1.2287	grains
Carbonate of Magnesia.....	.5412	grains
Oxide of Iron and Alumina.....		traces
Silica .....	1.1197	grains
Organic and Volatile matter.....	.2332	grains
Total .....	<u>3.6759</u>	grains

The water is colorless, tasteless and alaline. Every mineral spring has its own personality and none possesses this individuality in a greater degree than the Poland spring. Two springs whose analyses would show identically the same quantities of



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the same ingredients would not on that account produce the same effect upon the system by the use of like quantities of their waters.

Absolutely pure water is always seeking impurities, and undoubtedly water of such approximate purity as that from the Poland spring, when taken into the system, immediately seeks and absorbs the impurities which are continually clogging the action of the interior organs. In fact the water flushes the whole system, thus ridding it of all soluble impurities, paving the way to a renewal of functional activity, and to the repair of damaged organs.

The discovery of the medicinal qualities of Poland spring water and the subsequent evolution of the magnificent summer resort that crowns the summit of one of the most beautiful hills in our State, together with the development of a business in putting up and shipping mineral water that amounts to as much in a financial way as the product of one of our large manufactories, show what faith, intelligence, business sagacity and enterprise can accomplish when brought in contact with the natural resources which are scattered with such profusion throughout the State of Maine.

We accompany this description with cuts of the Poland Spring House, one of the largest summer hotels in Maine, the spring house near by, and the Maine State building which did service at the World's Fair in Chicago, since removed to Poland Spring.

*Polsko, Highland, White Oak Hill and Keystone Mineral Springs.*

The town of Poland is noted for its mineral and medicinal springs. In addition to the world-renowned spring belonging to Hiram Ricker & Sons of South Poland, described elsewhere in this article, there are the Polsko spring, the Highland spring, the White Oak Hill spring, and the Keystone spring. These are all situated on high elevations and the waters of all of them are recommended for diseases of the kidneys and associated derangements.



*Richmond Mineral Spring.*

This spring is located about one-third of a mile northwest of Richmond village in a very pleasant and romantic spot. A granite receptacle has been built, into which the spring flows in abundant quantity.

The analysis shows this to be a true mineral spring, with sulphate of potash, sulphate of lime, chloride of sodium, carbonate of lime and carbonate of soda in solution. The water is recommended for all diseases of the kidneys and urinary organs, also for rheumatism, salt rheum and scrofula. This spring was discovered only a few years ago, but the curative qualities of its waters are fast being recognized.

*Sabattus Mineral Spring.*

This spring is located on the south side of Sabattus mountain in the town of Wales, near the Webster line. The proprietor has put in a granite tank, five feet long, four feet wide, and four feet deep, into which the spring flows. Its capacity is  $4\frac{1}{2}$  gallons a minute. The water is recommended for kidney complaints and stomach troubles. The analysis shows this to be a true mineral spring, with sulphate of potash, chloride of sodium, carbonate of soda, carbonate of lime, carbonate of magnesia, and oxide of iron and alumina in solution.

*Scarboro Mineral Spring.*

This spring is situated five miles from Portland, near the Pleasant Hill road, leading from Portland to Scarboro beach, and one and one-half miles from Scarboro Beach station on the Boston & Maine railroad. The spring has long been known, and it is said that 50 years ago people would walk out to this spring from Portland two or three times a year to drink its waters, claiming that they gave them new life. It is also said that the Indians knew of the spring and used to camp near it for the sake of the "medicine water."

Into a triangular granite basin the waters of the spring rush at the rate of 40 gallons a minute, at a temperature of 45 degrees, winter and summer. This would afford a quart of water

a day for every person in a city of 200,000 inhabitants. The analysis of the water shows salts in the gallon as follows:

Sulphate of Potash.....	.840 grains
Sulphate of Lime.....	.818 grains
Chloride of Sodium.....	1.056 grains
Bi-Carbonate of Soda.....	1.271 grains
Bi-Carbonate of Lime.....	1.651 grains
Carbonate of Iron.....	1.539 grains
Silicic Acid in Solution.....	.984 grains
Total .....	8.159 grains

It is an alkaline chalybeate spring, of unusual purity, and one that retains the iron in solution under ordinary exposure. The water is recommended for all diseases of the liver and kidneys, and for loss of vital energy. It has been used extensively as a table water with great satisfaction, especially to those needing a mild tonic holding iron in solution.

#### *Seal Rock Spring.*

This spring is located in Saco, one mile from the center of the city. Its capacity is about 12,000 gallons daily. The medicinal value of the water consists in its purity. It seems to be nearly free from solid matter and it is considered by leading physicians to be the equal of any water in the market. The water is used very extensively in Saco and Biddeford for table use.

#### *Stockton Mineral Spring.*

This spring is located in the town of Stockton Springs, Waldo county, about one and one-quarter miles from the village. Its capacity is 11,000 gallons in 24 hours. Considerable quantities of the water have been shipped to Boston. It is recommended for eczema and stomach troubles.

#### *Thorndike Mineral Spring.*

This spring is known as Higgins' mineral spring and it has quite a local celebrity. The principal minerals held in solution in its water are magnesium, sulphur and iron. Many people

who have lived to a ripe old age attribute their healthfulness and freedom from disease to the liberal use of the waters of this spring.

*Togus Mineral Spring.*

This spring is located in the town of Chelsea, near Augusta. It formerly had some notoriety and a Mr. Beal of Boston erected a large hotel near it. The enterprise did not prove profitable and the property was sold to the United States. The land in the vicinity was also ceded to the United States Government for the purpose of a home for disabled soldiers of the Civil War. The spring belongs to the sulphureous class and possesses medicinal qualities of great value.

*Underwood Mineral Spring.*

This spring is situated at Falmouth Foreside, in the town of Falmouth, Cumberland county. Its capacity is 20,000 gallons in 24 hours. The waters are recommended for Bright's disease, rheumatism, gout and dyspepsia.

This spring is only six miles from the city of Portland. The Portland Street Railway Company has made a park of the grounds around the spring, and here in the summer season thousands of visitors resort to drink the clear, pure water from the wonderful spring and to enjoy the beauties of this attractive spot.

The spring has been known more than 200 years, although, like most mineral springs, it is only within the last 50 years that the waters have been sold and drank on account of their medicinal value. The proprietors of the Underwood spring have a fine bottling house and they put up and send away large quantities of the water.

*Utona Mineral Spring.*

This spring is located in Eastport, Washington county. The water is of exceptional purity and is prescribed extensively by local physicians to their patients. The water from this spring has not been sold to any great extent out of the State, although it ranks with the best mineral water where it has been used.

*Wawa Lithia Mineral Spring.*

This spring is in the hamlet of Ogunquit, town of Wells, York county. It is a true mineral spring and belongs in the saline class. The analysis shows to be present calcium sulphate, calcium chloride, sodium chloride, magnesium chloride, lithium carbonate, iron carbonate, silicon carbonate and carbonic acid. The analysis discloses in this spring almost as much lithia as there is in the famous Elizabeth spring of Hamburg, Germany.

A wall of white granite blocks has been built around the spring, this wall being encased in Portland cement. A house has been erected over the spring, so that now there is absolutely no danger of surface contamination. The water is recommended for all disorders of the kidneys, also for stomachic and intestinal catarrh.

*Other Mineral Springs.*

There are mineral or medicinal springs in Lewiston and Minot in Androscoggin county; Gorham, New Gloucester, Pownal, Raymond and Westbrook in Cumberland county; Winslow in Kennebec county; Fryeburg, Oxford and Roxbury in Oxford county; Brewer and Lee in Penobscot county; St. Albans in Somerset county; Limington and Newfield in York county; from which we have received no analysis or description.

## SUMMARY.

Our list includes 81 mineral springs, while several others have already been discovered whose virtues are less fully known, and probably others will yet be found. The Division of Mining and Mineral Resources of the Department of the Interior at Washington makes a report each year of the production of mineral waters in the United States. Of all the Maine mineral springs only 22 reported in 1901, the latest figures at hand. These 22 reported an aggregate sale of 738,969 gallons of water in that year, valued at \$89,425. Poland spring did not report, yet the Poland spring office in New York city alone is selling water to the value of \$200,000 annually. Other springs which sell large quantities of water did not report. Thus it will be

seen that the amount named above falls far short of the actual sales of mineral water in our State.

If we add the annual sales of Poland water through the New York office to the value of water sold from those that reported in 1901, it will give a total value of \$289,425. Then the sales of Poland water through the Boston office and the sales from all other springs that did not report would place the gross amount received for Maine mineral water between \$300,000 and \$400,000.

There are employed in the bottling houses and in driving teams to convey the water to stations, from 150 to 200 men at good wages. The sale of Maine mineral and medicinal waters is increasing rapidly, and can even now be classed among our important industries. The sales will continue to increase as the purity and the curative properties of the water from our springs become better known by means of advertising, the best advertisement being the testimony of persons who have been benefited by the use of the water.

Other states may have as good mineral water as the State of Maine, but they have none better, purer, clearer, or more conducive to good health and long life. Our mineral waters, like our granite, slate and lime, are inexhaustible. We have enough to supply the world.

## THE MINERAL RESOURCES OF MAINE.

## GRANITE.

In 1901 the value of all granite produced in Maine was \$2,689,300. The same year Massachusetts produced granite to the value of \$2,216,258. Thus Maine led Massachusetts by \$473,042, and became the first state in the Union in the production of granite. This position Maine is very likely to hold, for her granite resources are inexhaustible. The granite is located along the entire coast at points easily accessible, so much so that it is often more advantageous for cities on the coast in the southern states to procure granite from Maine for public buildings than it is to get it from interior points in their own states.

In the report of the Maine Bureau of Industrial and Labor Statistics for 1902 our granite resources were described at length, and the locations of our unsurpassed granite quarries were clearly and accurately defined. Granite of excellent quality for building, monumental or ornamental purposes is found in nearly all parts of the State in such quantities that if all the public buildings in all the cities of the world should be constructed of Maine granite for the next thousand years, no perceptible decrease in our granite supply would be apparent.

## LIME AND MARBLE.

In 1901 the value of the lime produced in Maine was \$715,272 and the number of casks of lime reported sold was 1,828,114. Maine ranks ninth among the states of the Union in the production of lime. The lime of Maine is noted for its excellent quality and is conceded to be equal to any found in the United States.

The manufacture of quicklime has been carried on principally in Rockland, Thomaston, Camden, Rockport and Warren in

Knox county, but there is an immense limestone belt running through the very center of the wild lands, extending from near Moosehead lake to the State line near Grand Falls, New Brunswick. Another belt of limestone still farther north, in the vicinity of the Fish river lakes, has recently been discovered. In the town of Carroll, in the northeastern part of Penobscot county, lime has been for years manufactured in a small way for the local market. In fact our limestone, like our granite, is practically inexhaustible.

In this connection we should mention the marbles of Maine. Marble is found at Machiasport, Thomaston, Hope, Camden, Sidney, Union, and in the northern part of the State. The marble at Machiasport is largely composed of fragments of shells. The most beautiful varieties are clouded red, and the red spotted with white. The marble is in layers and presents a very handsome appearance, especially on the shore, where it has been worn by the waves of the sea.

Some of the limestones of Rockland, Thomaston, Hope and Camden may be termed marble. It is more profitable at present, however, to quarry the rock for the manufacture of quicklime than for marble. There is very fine statuary marble on the east branch of the Penobscot river, and marble of various qualities has been found at several points in the wild lands. Whether fine marble exists in the State in sufficient quantities to make it profitable to work the quarries is a question to be decided in the future.

#### SLATE.

In 1901 the value of the slate produced in Maine was \$202,325, a gain of \$24,983 over that of 1900. There is a great belt of roofing slate extending from the Kennebec river at Caratunk nearly to the Penobscot river, a distance of eighty miles.

Quarries have been opened and operated on this belt at Brownville, Blanchard, Monson, Williamsburg and various other towns in Piscataquis county. The slate crops out in nearly every township along this belt, and is equal in quality to any slate in the world. It has been found at several points farther north and geologists tell us that our slate deposits are inexhaustible.

## CLAY.

In 1901 the total value of brick and tile manufactured in Maine was \$734,678. In the year 1900 the clay products amounted in value to \$724,934. The number of operating firms engaged in making brick and other clay products in 1901 was 74.

Plastic blue clay, suitable for the manufacture of brick and tile, is found in abundance along the coast and in the river valleys of Maine.

A bed of potters' clay has recently been discovered in Bangor and is now being tested at a pottery in that city.

Like granite, slate and lime, the clay beds of Maine are inexhaustible, and in some localities the quality is so excellent that the finest tile could be manufactured with profit. The brick and tile making industry is capable of indefinite expansion in the State of Maine.

## IRON.

Iron ore exists in Maine in large quantities. The varieties are hematite, magnetic and bog ore.

An immense bed of red hematite occurs in Wade plantation in Aroostook county, sufficient, it is calculated, to produce 97,000 tons of iron.

There are veins of magnetic iron ore on Mount Desert and some of the adjacent islands, also in the town of Buckfield.

An immense bed of bog iron ore occurs in the town of New Limerick, Aroostook county. At Katahdin Iron Works in Piscataquis county, a large amount of iron has been manufactured from bog ore. In the town of Newfield, York county, iron has also been manufactured from bog ore. Extensive deposits occur in Shapleigh, Argyle, Clinton, Williamsburg, Bluehill, Lebanon, Union, Canton, Paris, Saco and Thomaston. There are also beds of bog ore in Bristol, Bucksport, Dixfield, Dover, Farmington, Greenwood, Jay, Liberty, Rumford and Winslow.

The above named localities are the principal points where iron ore has been found, but whether it will ever be profitable to work these immense deposits and manufacture pig iron in our State is a question for capitalists to consider and decide. The ore is here in abundance and railroads now run very near the richest deposits.



*The Katahdin Iron Works.*

In 1843 a man named Walter Smith of Newmarket, New Hampshire, discovered extensive beds of iron ore on Ore mountain, one of the smaller elevations of the Ebeeme range in Piscataquis county. He immediately bought that part of the township in which Ore mountain is situated. His son, Edward Smith, began the actual operations of mining the ore. He cut roads and built the first furnace on the township. He did not, however, undertake the manufacture of iron to any great extent, and in 1845 sold out the entire plant to David Pingree of Salem, Massachusetts.

Mr. Pingree associated himself with other capitalists and began the business of making iron in earnest. Marketing the product was expensive for the reason that the iron had to be hauled by teams to Bangor, about 60 miles away. They continued, however, until 1856, producing in that year 2,350 tons of pig iron. Work was then suspended and the plant remained idle for several years, but finally passed into the hands of Hinckley and Egery of Bangor, iron founders and stove manufacturers.

Soon after the close of the Civil war this firm erected new furnaces and started up the works. They quit when they found the business unprofitable.

In 1883 the Katahdin Iron Works branch of the Bangor and Piscataquis railroad was built, connecting with the latter road at Milo. This branch to the Iron Works was built by a company organized by O. W. Davis, Jr., of Ohio, which company had then been operating the plant for many years.

In preparing the iron for market there were two processes. When the ore was first hauled from the mine, it was dumped into a monster oven or roaster, where it was thoroughly baked. This removed the sulphur and some other impurities, and when the ore came out from the roaster it was of a dull coppery red color. From the roaster it went into the blast furnace to be smelted. The blast furnace was fed with charcoal and limerock, which produced a tremendous heat.

The charcoal was made from hard wood grown near by, and the limerock obtained from quarries in Sebec, 14 miles away.

It required many thousand cords of wood to furnish material for the charcoal.

When the ore was properly smelted it was drawn from the furnace and run into pigs or bars. The iron thus produced was too hard to command the best price and to soften it the company began to import a Spanish ore, the softest in the world, to mix with the native ore.

This mixture produced some of the best pig iron in the country and the construction of the railroad enabled the company to get it to market at much less expense than by team; but now an unlooked for calamity came. The price of pig iron began to drop and it kept dropping until it reached the figure of \$10.00 per ton. As it was costing the company nearly \$20.00 to produce a ton of iron, it was obliged to stop business, which it did in 1888.

The company had on hand quite a quantity of pig iron piled up near the works. After a while it was sold, and, strangely enough, soon after it was disposed of, the price advanced to a point equal to the cost of manufacture.

There was a considerable settlement at Katahdin Iron Works at one time; but, after the collapse of the industry, the employes sought work and homes elsewhere, the smelting works were stripped of what there was valuable in them, and the place assumed a somewhat deserted appearance. It was not entirely deserted, for the old works were situated in the heart of a rugged mountain chain, beside a silvery sheet of water, and the spot has become a very beautiful and attractive summer resort.

It is not impossible that these ore beds may be worked again, for it is said that they contain other ores besides iron. The fact remains that iron mining was carried on here for nearly thirty years and many thousands of tons of pig iron of the very best quality were manufactured.

#### LEAD.

The richest lead mine in Maine, so far as known, is in the town of Lubec, Washington county. This mine has been worked considerably and many tons of ore have been taken from it. In some of the veins there is quite a percentage of zinc combined with the lead. Galena, the principal ore of lead, is found in Bluehill, Cherryfield, Dexter, Eastport, Marion, Parsonsfield,

Scarboro, Thomaston, Topsham, Warren and several other towns.

Some of the deposits are rich in lead and are very favorably situated in regard to accessibility and the ease with which they might be worked. Any marked increase in the price of that metal would cause those interested in mining to investigate the lead mines of Maine. In this connection it may be said that nearly all of our lead mines contain silver to some extent and some of them have been worked for silver rather than lead.

#### COPPER.

The richest copper belt in Maine is in the town of Bluehill, Hancock county, and is four miles long and a half mile wide. The richest copper ore seems to be confined to a soft granular quartzite. The whole deposit is clearly stratified and appears to be an immense fissure vein, the whole mass of which is impregnated with cupriferous ores. In the "mining" days of 1879 and 1880 large quantities of copper ore were taken from the Bluehill mines and shipped away to be smelted.

A copper belt that promises well is situated in the town of Marion, Washington county. At West Quoddy Head in Lubec, there is a vein of lead and copper, and at Cutler there are veins of lead, copper and zinc. Copper has also been found in Kosuth township near Carroll and in several other towns in the State.

Owing to the great demand for copper, occasioned by the rapid multiplication of telegraph and telephone lines and other applications of electricity to industrial development, it is very likely that the copper mines of Maine may at some time be worked profitably. That copper ore exists in abundance within our state is an admitted fact.

#### TIN.

Tin has been found in one or two localities in Maine. A mass of tin ore weighing five pounds was found many years ago at Mount Mica in the town of Paris. Professor Hitchcock thought that at some time tin ore would be found in paying quantities in the hills of Oxford county. In Bluehill the mineral wolfram occurs in granite. This, in the English mines, is considered an indication of tin.

## GOLD.

There is an extensive tract in the northwestern part of the State, in which free gold has been found. It has been obtained in small quantities on the Sandy river at various localities between its source and New Sharon, on the Swift river in Oxford county, especially in the town of Byron, and in several localities near the head waters of the St. John river. It has been found, also, in other and widely scattered sections of the State, in Corinna in Penobscot county, St. Albans in Somerset county, Cherryfield, Columbia and Harrington in Washington county, and Saco and Waterboro in York county.

The quartz rocks from which the scales of gold in the beds of the Sandy, Swift and St. John rivers originate will probably at some time be located, and then it will be determined whether gold mining in Maine can be made profitable.

Some of the ores of the State are auriferous, notably those found at Bluehill. These ores do not probably contain gold enough to pay for working them for that metal alone, but in working the ores for other metals the gold would form a valuable accessory part of the operation.

It has been reported that both gold and silver have been traced in the quartz and slate rocks in the vicinity of Rockland, and that an assay is now being made.

Specimens of ore from the vicinity of Indian Hermit mineral spring in the town of Wells have been shown, which is said to contain gold, silver, copper and lead. Some of this ore has been assayed, and by two different assayers gold has been found to the extent of from \$3.00 to \$20.00 per ton. It would appear that an examination of the rocks in the vicinity should be made, and the fact determined whether the ore is rich enough in mineral wealth to warrant development.

## FELDSPAR.

The feldspar produced in the United States is used chiefly in the manufacture of pottery and wall and floor tiles. It is also employed in the manufacture of wood fillers, scouring soaps and glass.

There are two great pottery centers in this country, one at Trenton, New Jersey, the other at East Liverpool, Ohio. The

value of the product of these two pottery centers in 1901 was \$10,626,350.

A Trenton company opened a quarry in Topsham, Maine, in 1869, and built a mill for grinding the feldspar, both of which have been operated continuously to the present time, the product being shipped to Trenton to be used in the manufacture of pottery.

There is a mill for grinding feldspar on Commercial street in Portland, and one in Auburn on the Little Androscoggin river.

There are also feldspar quarries in Auburn, Hebron, Peru, Phippsburg, Rumford, Paris and several other towns. Maine feldspar is said to be of excellent quality, and the business of quarrying and grinding it seems to be increasing yearly. The ground feldspar is always in demand and sells readily at a price that renders the business profitable.

#### MICA.

Mica is found in Maine at various points, but the most valuable quarries are in Oxford county. As far as we have any records the first mica mined in Maine for commercial purposes was taken from the quarry at Mount Mica in the town of Paris in 1871. At present this quarry is not worked for mica especially, but for tourmalines and other gems. Incidentally, however, it produces large quantities of mica even now.

The Consolidated Mica Company of Boston has several mines in Oxford county, but is operating only one at the present time. This one is situated at Rumford Point, and large quantities of mica of excellent quality have been taken from it. In 1901 a quarry was opened on Hedgehog mountain in Peru, and the mica proved to be of the best quality.

Mica is found in the town of Paris at two points, nameiy, Streaked mountain and Mount Mica, also in Bethel, and in several other localities.

#### TRIPOLI OR INFUSORIAL EARTH.

There are extensive beds of tripoli or infusorial earth in Bluehill, Hancock county, and in 1901 these deposits were worked. We have no record of the amount of the product taken out.

## MOLYBDENITE.

Molybdenite is a rare and valuable metal which occurs in granite, gneiss, mica schist and granular limestone. It is found in thin, foliated, hexagonal plates or masses, is very flexible, feels greasy, and will leave a trace on paper similar to graphite, which metal it resembles. Its color is bluish gray or slate color. It is found in various localities in Maine, namely: Bluehill, Belfast, Bowdoinham, Brunswick, Cooper, Norway, Sanford and Topsham.

The American Molybdenum Company owns a tract of land in Cooper, which contains an immense deposit of this metal. The company has already investigated this property to some extent and the results of the investigation would seem to assure a safe and profitable return on the investment of capital required for its development.

Molybdenite is in great demand in the manufacture of armor plate and smokeless powder and in coating shells used in heavy guns. It is also a good substitute for platinum in electrical appliances. As a lubricator, for diminishing the friction of machinery and preventing hot boxes, it has no equal; and it is an absolute fireproof packing for safes, not being affected by heat.

## COAL.

Some investigations have been going on during the past year in localities in Aroostook, Penobscot and Washington counties, where it was believed that deposits of coal existed. The several localities have been visited by a United States geologist, who has reported decidedly that there is no indication of coal at the points visited in Aroostook and Washington counties. Referring to the location in Penobscot county he says that the carbon-content of this rock appears too low to justify the formation being called coal bearing.

## TOURMALINES AND OTHER GEMS.

Tourmalines are found in Maine in the following named towns: Albany, Auburn, Bethel, Bluehill, Bowdoinham, Brunswick, Camden, Falmouth, Georgetown, Greenwood, Hallowell, Hebron, Limerick, Lisbon, Paris, Sanford, Searsmont and Windham. Probably the above list does not include all the

towns where they are found, as specimens are constantly being discovered in new and unexpected places.

From a paper on "The Minerals of Maine," prepared by E. R. Chadbourne of Lewiston, we are kindly permitted to quote at will, which we do, as follows:

"The most beautiful product of the Maine rocks is the tourmaline. This is the queen of American gems, the stone that it has been proposed to adopt as the national gem, and the extraordinary specimens from these rocks surpass those of other American localities, if not those of the world, in rarity and beauty. No other mineral has such a range of color, every tint of the rainbow being represented in its crystals. Some of these crystals are red, white and blue, and in some wonderful crystals found in 1866, also some found in 1881, the top is of green, the center of white, which passes into pink further down, while the base is of indigo blue.

"The mineral has a complex composition, being essentially a silicate of aluminum and boron, with varying proportions of iron, manganese and lithium. It has the power of polarizing light, also of double refraction, with which we are most familiar in Iceland spar.

"The first tourmalines at Mount Mica, in Paris, were found in 1820, by two students, one a brother of Hannibal Hamlin. These two young men obtained about thirty crystals, part of which were afterwards lost and have since reappeared in the Imperial Cabinet of Minerals at Vienna.

"In 1825 the place was visited by Prof. Charles U. Shepard, who obtained some of the finest specimens of the tourmaline ever found, most of which are now preserved at Amherst college. From the lot he has cut a grass-green gem, about an inch long and three-fourths of an inch broad, a marvelous red gem of similar size, and a white one two-thirds as large.

"Since 1881 mining has been carried on by the Mount Mica Company. The work was at first done at irregular intervals, but it has been continued each season since 1890, thus giving to Maine one of the very few systematically operated gem mines in America. Most of the crystals are small, but it has been estimated that from 100 to 200 of the many thousands found here would be considered remarkable specimens of the mineral.

"The largest transparent green crystal known was found in 1886. It is 10 inches long,  $2\frac{1}{4}$  inches in diameter, weighs 41 ounces, and, with both terminations preserved, it is now in the collection at Harvard university. In the same cabinet is the most remarkable white tourmaline known. This was found here in 1869, and is white at the top, shading into smoky color toward the base, but is crimson when viewed along the axis, and the terminations are tipped with green.

"The finest known blue tourmaline is in the Hamlin collection. This was broken into five pieces when found, but has been restored with both terminations complete. It is transparent and sapphire blue in color, changing into green at the top.

"A crystal from the find of 1893 was sold to Tiffany of New York for \$1,000. One priced much higher was found in the fall of 1897, this being about 9 inches long, with a transparent nodule at the tip 2 by  $1\frac{3}{8}$  inches in size, and capable of cutting a magnificent green gem of about 80 carats, with several smaller ones. It is the finest specimen of the kind ever known.

"Dr. Hamlin of Bangor, president of the Mount Mica Company, an authority on the tourmaline, has secured a large portion of the fine crystals from Mount Mica, forming by far the finest collection of tourmalines in the world, much of which has lately passed into possession of Harvard university.

"In Auburn, near the Minot line, a boy named Lane picked up, in 1862, a piece of what seemed green glass. He took it to his home, where it was seen by Dr. Luther Hill, who recognized in it a tourmaline fragment. The locality since known as Mount Apatite was thus discovered and long afterwards produced several thousand dollars' worth of fine tourmalines. The search was continued intermittently for several years.

"This place is now worked as a feldspar quarry, and the operations of the last two or three years have yielded some interesting discoveries. One of these was a find of herderite in the finest crystals known. This mineral was found in Saxony prior to 1825, but in recent years has been obtained only at few localities in Maine, and only at Auburn in the exquisite little brown crystals with transparent tops, that well might lead the gem lover to look for a fresh addition to his list of fine stones.

"On Mount Apatite, also, a large pocket of smoky quartz was opened in the fall of 1897, and from this has been taken a large quantity of material of extraordinary quality, including transparent smoky crystals, with polished faces of brilliant black, up to 100 pounds in weight, also, transparent yellow quartz of superb color for cutting into ornaments. The showy appearance of this quartz led to considerable local excitement."

Kunz, the gem expert of Tiffany and Company, New York, in his book entitled, "Gems and Precious Stones," estimates that, from Mount Mica alone, more than \$50,000 worth of tourmalines and other gems have been taken.

Mr. Chadbourne has furnished the Bureau with the following list of minerals found at Mount Apatite: albite, with cleavelandite, its variety; arsenopyrite, autunite, bertrandite, beryl, biotite, calcite, cassiterite, cooksite, chalcopyrite, columbite, garnet, gold, graphite, herderite, lazulite, lepidolite, molybdenite, montmorillonite, muscovite, orthoclase, pyrite,



pyroxene, pyrrhotite, quartz, spodumene, tapiolite, tourmaline, red, green, blue and black, and triplite. Some of these varieties are obtained in exceptionally fine specimens.

Another mineral product of possible value is obtained here, namely, graphic granite, which seems to exist in considerable quantity and of very fine quality.

The tourmalines are the most important of Maine gems. The beryl is one of the common minerals, and is sometimes found in bluish-green crystals with transparent spots, from which are cut aquamarines. Of such gems Maine has furnished notable specimens. One from Stoneham, Oxford county, is the finest ever found in the United States, the cut stone being an inch and two-fifths in each diameter and weighing 133 carats.

Remarkable beryls have been obtained at Topsham. Some have been found five inches in length and an inch in diameter, of great transparency and beauty; the colors being green, yellow and white. A few beryls have been found of enormous size. One was found at Mount Apatite a few years ago, that was 12 feet long and 20 inches in diameter.

The best topaz crystals of the eastern states have been secured at Stoneham, which is one of the several topaz localities in New England. Another Stoneham mineral is beryllonite, which is found at no other locality in the world.

Besides the smoky quartz already referred to, several other beautiful varieties are found in Maine. The finest rose quartz ever known has been obtained in Paris, near Mount Mica; and amethyst, which is a purple quartz, has been found in Stow, Oxford county, in crystals of rare fineness of color.

Garnets are occasionally picked up in transparent gem crystals, splendid cabinet specimens of cinnamon garnet being found in Raymond and Phippsburg. Green garnets have been found in fair crystals in Hebron and West Minot.

The largest aquamarine ever obtained in the United States was cut from a beryl found in Stoneham, and is now in the Field Columbian museum in Chicago.

Mr. Chadbourne states that from a small crystal found in Topsham he has lately had cut the finest yellow beryl gems, two in number, ever obtained in Maine, one of them weighing  $36\frac{1}{8}$  carats, and the other 34 11-16 carats. The latter is still in his possession.

In Professor Hitchcock's catalogue of the minerals of Maine, he names 132 towns and plantations where minerals are found. In 36 towns pyrites of some variety are found and sometimes in such abundance that, without doubt, the deposits could be profitably worked. From pyrites can be manufactured copperas, sulphur, alum and carbonate of soda. Some of these products are very easily obtained from pyrites.

In 25 towns some ore of iron is found, usually in large quantities. In 13 towns graphite is found. Galena occurs in 11 towns and plumbago in 1. In Deer Isle are found serpentine, which is valuable for ornamental purposes, also verd antique, asbestos and diallage. Serpentine and asbestos are also found in Hampden. Steatite or soapstone is found in Hope and at several points in Harpswell.

In Camden and Liberty are immense quantities of fine quartz, suitable for making glass. Quartz is also found in many other localities in the State, especially in Oxford county. In 5 towns amethyst is found, sulphuret of antimony is found in 1 town and actinolite in 1 town. Manganese is found in Bluehill, Winthrop and Thomaston, and black oxide of manganese is also found in Bluehill.

While not attempting to present a complete list of minerals found in Maine, we would add to those already mentioned the following: alumina, andalusite, native arsenic, axinite, cancrinite, chalcopyrite, chalcedony, chalybite, chlorite, cinnamon stone, native copperas, emerald, fibrolite, fluor-spar, gypsum, hornblende, idocrase, kerolite, macle, mispickel, olivine, pargasite, rhodonite, scapolite, sodalite, staurotide, talc and zircon.

#### MARL.

Two substances are commonly called marl, the one of calcareous origin, the other of siliceous origin. One is nearly pure carbonate of lime, and the other is nearly pure silica. The former is the most valuable. The calcareous marl is largely composed of the shells of molluscous animals such as snails and clams. It is continually forming at the bottom of ponds from the accumulation of these shells. It is generally a fine, white powder. When the pond has become filled with the accumulation so that the water has disappeared, vegetation may conceal the marl.

There is a large bed of marl near Ambajejus lake, north of the west branch of the Penobscot river. A long expanse of bog occurs at one end of the lake and this is underlaid by beautiful white marl of unknown depth. It extends from Ambajejus to Millinocket lake, where the marl appears again. There are marl beds, also, near Presque Isle in Aroostook county. Impure marl has been found in Saint Albans, Somerset county.

Siliceous marl is composed entirely of the skeletons of microscopic animals and plants. These plants and animals live in the pond and their imperishable remains collect on the bottom and form the marl or polishing powder as it is sometimes called.

Over the bottom of Chalk pond, in the town of Beddington, Washington county, siliceous marl has accumulated to the depth of several feet. A company was formed some years ago and a plant erected for preparing it for market. It sold readily for use in covering steam boilers and pipes, as it is an almost perfect nonconductor of heat and cold. This plant was operated for several years, but was finally destroyed by fire, and has not, to our knowledge, been rebuilt.

Other places where siliceous marl is found are Calais, Limerick and Newfield. Undoubtedly other deposits will be discovered.

#### PEAT.

There are many peat bogs in Maine, varying from small plots of a few square rods to several thousand acres in extent, and scattered very generally throughout all sections of the State, and it is very probable that the peat contained in some of them can be utilized as fuel.

On account of the almost prohibitive price of coal and the consequent rise in the price of wood during the season of 1902-3, the minds of many thinking men have been turned to our peat bogs as a source of fuel. While most sections of Maine are bountifully supplied with wood of the best quality, the annual growth of which no doubt will be sufficient to supply all local demands for generations to come, it may be wise to conduct such experiments as will determine the cost of preparing peat for fuel by drying, as well as the cost of manufacturing it into the more desirable form of briquettes.

An attempt is now being made to prepare the peat of the Farwell bog in Lewiston for fuel. This bog covers about 108 acres, and the peat, which is formed from a very fine moss, is of considerable depth. It is estimated that each foot in depth will produce 50,000 tons of prepared fuel. A corporation recently formed has secured about 500 acres of peat bog in Orrington. One of the officers writes us that they are getting ready as fast as possible to begin operations as soon as the frost is out. If it is found that this material can be worked into a commercial fuel at a reasonable cost, so as to take the place of anthracite coal where intense heat is not required, it will add a new industry to our State which in time may develop into considerable importance.

Several plants have already been erected in the province of Ontario, Canada, where experiments in converting peat into briquettes are being carried on, as in the one already mentioned at Lewiston in this State.

In many sections of Europe where wood and coal are expensive peat is an important article of fuel. At the present time from 9,000,000 to 10,000,000 tons of peat are dug annually mostly by use of the hand spade, Russia producing in round numbers 4,000,000 tons, Germany 2,000,000 tons, Holland and Sweden 1,000,000 tons each, while Austria, Denmark, Iceland, and other European countries produce large quantities. For the most part it is simply dug and sun dried and burned in its natural state.

Briquettes from anthracite coal screenings are largely manufactured in European countries, also poorer grades from bituminous and brown coal and lignite, and in recent years more or less success has been achieved in their manufacture from peat, some using a mixture with other combustible substances while others use only the peat and prepare it by drying, grinding, screening and pressing into solid bricks.

Peat, when dug from the bog, contains from 80 to 90 per cent of water, so that in raising a ton of material from the bog only from 200 to 400 pounds of the dry peat is obtained. This expense of handling and the great cost of evaporating the water by artificial heat have been some of the main obstacles to be overcome in the successful manufacture of peat briquettes.

Mr. Edwin N. Gunsaulus, American consul at Toronto, Canada, who had been instructed by the home government at Washington to make some investigations in the matter of peat briquette making in that section, on October 31, 1902, made a report in which he said:

A word of caution to intending operators may be timely. I notice many references in the public press in regard to the formation of companies proposing to utilize peat beds. Fully \$400,000 has in the course of seven or eight years been practically wasted in Canada in futile attempts in this line. It would appear advisable for intending operators to confer with those in Canada, who have the advantage of thorough acquaintance with peat in its practical manipulation, before adopting untried methods or appliances. European practice, I am told, although successful, in many instances environed by special circumstances, notably cheap manual labor, cannot be profitably followed on this side of the Atlantic.

"Many peat deposits are not suited for practical use. Only bogs of an average depth of 4 feet and upward and of considerable area (at least 100 acres) should be selected, on account of the expense of the plant. The quality of the peat, feasibility of drainage, and accessibility to some means of transportation should also be considered. Mr. E. J. Checkley, of Toronto, who has been intimately connected for years with peat development in Canada, is investigating peat properties in Illinois, Wisconsin, and Minnesota. He reports that the grass peats of Wisconsin appear to carry so great an admixture of alluvial substances as to make the percentage of ash too high to admit of the satisfactory use of the peat for commercial purposes. The moss peats of northern Wisconsin are much superior in quality, although farther removed from large centers affording the best markets.

"The Canadian industry has profited by the cooperation existing among the organizations and individuals I have mentioned as interested in peat development, obviating one source of weakness arising out of attempts made by individual patentees, whose achievements usually embrace only one appliance, leaving many important steps wholly unprovided for. Every one of the many links required to complete the chain of apparatus for a complete outfit should be made sure of before investors embark in the enterprise."

On April 1, 1903, Mr. Gunsaulus made a supplementary report from which we quote:

"In my report of October 31, 1902, I cautioned intending operators against adopting untried methods and appliances, and now for their benefit I give the following information gleaned

from a report by Mr. James Milne (an engineer of Toronto) which was made for the benefit of interested capitalists.

"A suitable bed of good quality of peat, of sufficient area to warrant the erection of a plant and capable of being drained, having been secured, the several operations are the following:

"1. Ditching and cleaning the surface of that portion of the bed to be used for digging and drying operations.

"2. Track laying.

"3. Digging, pulverizing, and spreading the peat over the surface of the bed, where the moisture is rapidly given up in ordinarily dry weather. This is most important. A great amount of money has been expended in trying to prepare peat for the drying plant, but hitherto without much success, as the handling of 80 or 85 per cent of water contained in peat beds is naturally a very serious problem.

"At the Beaverton plant this is done by an excavator, or harvester, which digs, pulverizes, and spreads the peat at one operation, only one man and a 10 to 15-horsepower motor being required to handle from 100 to 150 tons in ten hours, when engaged in working on peat containing about 80 per cent of moisture.

"The harvester consists of an endless chain with special buckets and cutters, driven by suitable mechanism, which cuts the peat the entire depth of the bog, and elevates it to a conveyor about 8 feet above the bottom of the bog. The machine is so arranged at present that it can cut any depth down to 4 feet, the depth being easily controlled by the raising or lowering of the lower end of the case containing the endless chain with the cutters and buckets. The spreading of the peat on the dry top of the bog is a most important part of the work, as tests show that the moisture can be reduced to about 36½ per cent after several hours' exposure on a good drying day. The whole machine, the harvester and spreader combined, is driven by a 6-horsepower electric motor. The rate of travel is from 3 feet to 3 feet 6 inches per minute, and the width of the cut is 12 inches.

"When the frost is out of the ground in the spring the men set to work to dig enough crude peat for firing the drier and boiler during the entire season. One man can dig sufficient peat in one day to keep the drier and boiler going two days. One man is also engaged in wheeling this crude peat to the boiler and drier.

"4. Gathering the peat after it has been exposed to the action of the sun and air, 70 tons of water out of each 100 tons of material having been evaporated by this drying process. The gathering was done by two men at the time Mr. Milne made his report, but I am informed that now, by means of an electrical peat gatherer, propelled by a 5-horsepower motor, the work of

several men is accomplished by one, thus effecting a considerable saving in the cost of finished fuel.

"5. Loading on electric dumping car and bringing the peat to the works or stack for winter use. This stage completes the field work. A car, driven by a 5-horsepower electric motor, is run from the level of the bog to a height of about 12 feet, where it is dumped into a large bin. The fuel is conveyed from this bin into the breaker, preparatory to its entering the drier. One man and a 5-horsepower motor can handle sufficient material in ten hours to make 30 tons of fuel. From this stage the process of manufacturing is automatic.

"The first five stages are estimated to cost at the rate of 40 cents per ton of finished product.

"6. Mechanical drying. The peat is conveyed from the bin or from the stack to the breaker or pulverizer where it is further disintegrated to facilitate drying, and thence passed to the drier, which consists of two steel tubes 35 feet long, inclosed in a brick arch, these tubes being provided with special devices for causing the rapid evaporation of the moisture remaining in the peat. The drier is fired with crude peat.

"From the drier, the peat can be sent directly to the press or be stored in the bin. The last is so constructed that it is possible to arrange the different outlets leading to the press conveyor so that peat containing different percentages of moisture can be mixed on the way to the press.

"7. Compressing into hard, dense blocks of finished fuel. As the press is a most important appliance in the manufacture of the fuel (the lack of a suitable one having, I am informed, retarded the enterprise for years), I will quote from Mr. Milne's report:

"The machine runs very nicely indeed. There is no jar, and unless you are intently listening you are unable to tell whether the press is running empty or doing work. Before I saw the machine I had, to some extent, made up my mind that there might be some point in connection with the revolving die block that might cause serious trouble, but after watching it work several hours at a time, with no one paying any especial attention to it, I am convinced that it can do most efficient work. Not once did I see it miss a block, and all the blocks were the full size and ran about the same weight. There are no water jackets around the dies, and the wear and tear upon them must be small. There are eight dies on each block, and I examined those that had been in operation for some time and the tool marks were still there. The diagram taken at the engine showed that only 13.77 horsepower is required to run the press up to this capacity of 2,651 pounds per hour, including all conveyors in connection with the same.

"The daily capacity of the press is  $13\frac{1}{4}$  tons, say  $12\frac{1}{2}$  tons, and the total cost of manufacturing less than 90 cents per ton

on an output of 12½ tons per day of ten hours. The above includes absolutely all the labor, including superintendence of the plant, but does not include repairs, depreciation and royalty, nor does it include interest on investment.

“Mr. James Lang, another well known mechanical engineer, who was sent by capitalists of Toronto to report upon the manufacture of peat fuel, says:

“During the summer of this year (1902) I had occasion to visit the peat factories at Beaverton and Welland, for the purpose of investigating the process and reporting on the cost of manufacturing peat fuel. I entered upon the investigation with grave misgivings as to the practicability of manufacturing upon a paying basis, but the successful working of the Beaverton plant was a revelation to me. The new machinery designed and introduced by Mr. Dobson, of that town, has revolutionized the process and made it possible to place peat fuel upon the Canadian market at a price which will compete successfully with coal. There is, undoubtedly, a great future for peat fuel in this country, and I have no doubt we are on the eve of an immense development of the industry.’

“Peat briquettes seem to be especially well adapted for use in grates. They ignite readily, a small handful of kindling being all that is required to start the fire. Soon after ignition, the peat gives off a bluish flame, which soon turns to a bright yellow, and increases in volume until the whole grate is filled with flame, rising nearly two feet above the fuel and throwing out a steady heat of considerable intensity. This flame continues for about an hour without renewal of fuel, after which there remain the glowing peat coals, the fixed carbon of the peat. The proportion of heat units found in a good sample of peat is, I am told, in the ratio of 5 to 7 of those in anthracite. Many people prefer the peat for light firing, especially in spring and fall, as a quicker fire can be made, and it can be better controlled than a coal fire.

“It is proper to say in this connection that the use of peat fuel for heating during the coldest winter months in a northern climate, where heavy firing is required, will not in all respects prove as satisfactory as coal, particularly anthracite, for the reason that it burns out more quickly.

“This difficulty can be largely overcome, I am told, by adding a small quantity of coal to the peat when the fire is fixed for the night. It should be remembered that to secure the best results in burning peat for domestic fuel a different method is required from that employed in the burning of coal or wood. Stoves and furnaces must also be especially adapted for the use of the fuel. In this country, however, the furnaces employed for peat are the same as those used for coal or wood, with the exception of the grate in the fire pot, a fine mesh being necessary to prevent the burning peat from falling through.



"Another point in connection with peat fuel briquettes is that the manufactured product must at all times be kept dry. Contact with water renders the peat practically valueless as fuel, hence care in transporting and housing it is of the utmost importance.

"I am informed that about 500 tons of peat fuel were manufactured at the plant at Beaverton during the last season, nearly all of which was sold for home consumption. A few carloads of this fuel were shipped to Toronto, where it retailed at from \$4.50 to \$4.75 per ton."

#### SUMMARY.

Notwithstanding the fact that Maine has within its borders almost every known mineral and precious stone, yet her mineral wealth consists mainly in her inexhaustible quarries of the finest granite, slate and lime in the world; in her abundance of clay of excellent quality; in her feldspar, mica and quartz, and in her unsurpassed mineral and medicinal waters, rather than in mines of the precious metals. Gold and silver exist in Maine, both in a free state and in combination with other metals.

There are rich deposits of iron, lead and copper. Tin, zinc and other useful metals also occur, but it may not be profitable at the present time to extend operations beyond the substantial and useful products named in the first paragraph of this summary, although many men of good business judgment think that our lead and copper mines could be worked profitably even now.

It should be a source of pride to every citizen of Maine to know that our State possesses such mineral wealth. In the matter of tourmalines and certain other gems, Maine leads all the states of the Union, and the cabinets of Harvard university, Amherst college and Field Columbian museum display, among their rarest and most prized specimens, the beautiful tourmalines, beryls and other gems from Maine.

If such a display of our fine and various colored granites, our lime and marble, our slate, our clay products, our mica, quartz and feldspar, our tourmalines, beryls, garnets and other gems and precious stones, should be made at the St. Louis fair, as it is possible and feasible to make, not only would our own citizens be enlightened and gratified, but the citizens of other

states as well, and Maine would receive the credit she merits as a mineral producing State.

The geological survey has, during the past season, rather exploded the hopes and expectations of finding coal within the borders of our State, but their investigations will undoubtedly prove that Maine has mineral wealth of many kinds concealed in her hills and valleys, and that the proper development of our mineral resources will pay good dividends on the investment of capital used for this purpose.

THE APPLE INDUSTRY OF MAINE.

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The apple is one of the most widely cultivated and best known and appreciated fruits belonging to temperate climates. In its wild state it is known as the crab apple and is found generally distributed throughout Europe and western Asia. The apple is successfully cultivated in higher latitudes than any other fruit tree, growing as far north as 65 degrees, but notwithstanding this, its blossoms are more susceptible of injury from frost than the flowers of the peach or apricot. It comes into flower much later than these trees, and so generally avoids the night frosts which would be fatal to its fruit bearing.

The best fruit is produced in countries of hot summer climates, such as Canada and the United States. Besides in Europe and America, the fruit is now cultivated at the Cape of Good Hope, in northern India, in China, Australia and New Zealand. Apples have probably been cultivated in Great Britain ever since the Roman conquest. According to a statement of the *Encyclopædia Britannica*, it is calculated that at the present time about 2,000 different kinds can be distinguished.

According to a noted chemist the composition of the apple is about as follows: water, 82.98 per cent; sugar, 8.25 per cent; albuminous substances, 5.32 per cent; free acids and salts, 3.45 per cent. From this analysis it will be seen that the apple is more than eight-tenths water, less than one-tenth sugar, a little more than one-twentieth albuminous substances, and a small percentage acids and salts.

According to the purposes for which they are suitable, apples may be classed as dessert, culinary and cider apples. Among the favorite dessert apples may be mentioned the Newtown Pippin, Williams Favorite, Astrachan and Gravenstein, and for winter use, the Baldwin, Spitzenberg and Roxbury Russet.

It is certain that apples were raised to some extent in this country in the early days of the colonies. It is also certain that

they were raised largely for the purpose of making cider, and it was only a little more than a half century ago that apples began to be cultivated extensively for dessert and culinary purposes.

The states having more apple trees than Maine are Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Missouri, New York, Ohio, Pennsylvania, North Carolina, Tennessee, Virginia and West Virginia. Most of these states have double the number of apple trees found in Maine, and several of them have three or four times as many. But in flavor and in keeping qualities apples raised in Maine are not equalled by those raised in any other section of the United States; and Maine apples, like Aroostook potatoes and Maine sweet corn, can always find a ready market. Maine apples, at the World's Fair in Chicago, after the destruction by fire of the cold storage building, kept sound and preserved their color and flavor, while those from other states rotted rapidly. This fact is one of the best advertisements that Maine apples ever had.

California raises more fruit than any other state in the Union, but a number of states raise more apples than California, and even Maine has nearly double the number of apple trees found there.

#### THE EXPORTATION OF APPLES.

On December 17, 1853, the Sarah Sands, a steamship of 1,300 tons, belonging to the Canadian Steam Navigation Company, arrived in Portland harbor from Liverpool, being the pioneer ship in the opening of regular steam communication between Europe and Portland. The vessel brought a full freight and 205 passengers. Her arrival was heralded by the ringing of bells and the firing of cannon, and on December 20 the Portland Board of Trade celebrated the event by a grand dinner at Lancaster hall, on the corner of Congress and Center streets, on which occasion there were many speeches by business men of Portland, representatives of the Grand Trunk railroad, and other distinguished men. On her return voyage the vessel took, among other freight, 1,000 barrels of Maine apples, and thus the exportation of apples from the port of Portland was commenced.

This was really the beginning of the export trade in apples in this country, as previously but few had been shipped to Europe from any port. For many years the number of barrels of apples exported was small and the business increased slowly, but after the close of the Civil war the trade became more brisk and continued to grow year by year.

Its magnitude at the present time is shown by the following figures: During the season of 1896-7 there was shipped to Great Britain from all American ports the grand total of 2,720,000 barrels of apples. During the season of 1902-3 there were shipped from America to Europe 2,468,169 barrels of apples. Of course the shipments depend on the size of the crop, and that of 1896 in this country was a record breaker.

The shipments of apples from Portland to Europe in the season of 1900-1 were 225,000 barrels, of which 97,000 barrels were from Maine, and the remainder were Canadian. The year 1901 was a poor apple year, and during that season only about 100,000 barrels were shipped, of which about one-half were from Maine. The shipments for the season of 1902-3 were 318,089 barrels, of which about 100,000 barrels were from points in Maine, while the remainder were from Canada.

During this investigation we have discovered that more than double the number of barrels of Maine apples are shipped to Europe from Boston than from Portland. A letter from the statistical department of the Boston Chamber of Commerce gives the following figures:

"The exports of apples to Europe from Boston during the season of 1901-2 were 144,167 barrels, of which amount about two-thirds, or 96,000 barrels came from Maine. During the season of 1902-3 there were exported from Boston to Europe 809,753 barrels of apples, of which amount about 50 per cent, or 405,000 barrels came from Maine."

Adding to the last named number the number of barrels of Maine apples shipped from Portland during the season of 1902-3, we have a grand total of more than half a million barrels of Maine apples shipped to Europe during the last season.

From replies to letters sent to many station agents along the line of the Maine Central railroad and other shipping points, we present the following figures in regard to the shipment of apples

from Maine from October 1, 1902, to May 1, 1903, which would include the shipping season of 1902-3:

From Dexter but few apples were shipped, not more than three carloads, all for Boston. As a car usually contains from 150 to 200 barrels, there were probably not more than 500 barrels of apples shipped.

From Gardiner the following shipments were made: To Portland, 210 barrels; to Indianapolis, Indiana, 1,777 barrels; to Cincinnati, Ohio, 167 barrels; to Boston, Mass., 2,315 barrels; to Europe, via Boston, 2,510 barrels; total, 6,979 barrels.

From Farmington there were shipped 2,543 barrels of which 2,303 barrels went to Boston.

From Winthrop there were shipped 12,772 barrels, all to Boston, the greater part for export.

From Auburn there were shipped 1,963 barrels to Boston, of which number 1,800 barrels were for export to Europe.

From Bangor there were shipped 1,465 barrels, of which number 1,200 barrels went to Boston.

From Monmouth, which seems to be a shipping point for several towns, there were shipped about 20,000 barrels, all to Boston, the greater part of which were probably for export.

From Waldoboro there were shipped 2,151 barrels, the most of which went to Boston.

From Livermore Falls there were shipped 3,000 barrels to Boston, of which number 2,000 barrels were for export to Europe.

From North Jay there were shipped 3,919 barrels, all for Boston.

From Thorndike there were shipped 1,055 barrels, of which 681 barrels went to Boston.

From South Berwick there were shipped 1,872 barrels, mostly to Boston and East Boston.

From Greene there were shipped 6,546 barrels, of which 5,973 barrels went to Boston.

From Turner there were shipped about 10,000 barrels to Europe via Boston.

From Bridgton and vicinity there were shipped 8,500 barrels, most of them for export to Europe.

It will be seen by the above that from shipping points east of Portland, apples for export to Europe are sent mainly by way

of Boston. Apples from towns along the line of the Grand Trunk and the Portland and Rumford Falls railroads, designed for export, are shipped mostly by way of Portland.

A prominent and reliable apple buyer has given us the following estimate of the number of barrels of apples raised last year in the following named towns.

Bethel, Oxford county.....	5,000 barrels
Bridgton, Cumberland county.....	11,000 barrels
Buckfield, Oxford county.....	10,000 barrels
Denmark, Oxford county.....	8,000 barrels
Dixfield, Oxford county.....	6,000 barrels
Fryeburg, Oxford county.....	6,000 barrels
Harrison, Cumberland county.....	11,000 barrels
Hartford, Oxford county.....	9,000 barrels
Hebron, Oxford county.....	11,000 barrels
Lovell, Oxford county.....	7,000 barrels
Norway, Oxford county.....	13,000 barrels
Paris, Oxford county.....	12,000 barrels
Sumner, Oxford county.....	12,000 barrels
Sweden, Oxford county.....	8,000 barrels
Waterford, Oxford county.....	6,000 barrels
Woodstock, Oxford county.....	8,000 barrels
Total .....	143,000 barrels

About two-thirds of the quantity raised in the above towns, or 95,000 barrels, were exported to Europe from Portland.

From the Eastern Steamship Company we have the following memorandum of apples shipped to Boston from the various landings along the Penobscot river and bay from October 1, 1902, to May 1, 1903:

From Bangor, 1,764 barrels; Hampden, 296 barrels; Winterport, 3,772 barrels; Bucksport, 354 barrels; Searsport, 353 barrels; Belfast, 6,134 barrels; Camden, 1,524 barrels; Rockland, 111 barrels; a total of 14,308 barrels.

#### ABSTRACTS FROM LETTERS FROM APPLE RAISERS.

The Bureau has many letters received during this investigation from those interested in apple culture, and has also copious notes of personal interviews upon the same subject, and, as in

almost all instances there are one or more practical suggestions, it is deemed proper to present briefly the principal contents of these valuable papers.

A letter from Turner, Androscoggin county, says:

"In reply to yours of recent date I will say that I have no positive knowledge as to how many apples were raised in Turner last year. I should judge that 10,000 barrels were shipped to Liverpool, London and Glasgow, and, as last year apples were spotted badly, probably 3,000 or 4,000 barrels were left at home, besides the drops and cider apples.

"The Baldwin and Spy are the main crop and the best sellers. Apple raising is increasing fast in this vicinity. Apples should be picked carefully, stored in cool cellars or storage houses and then properly assorted by experienced packers for export. The best apple towns near Turner are Greene, Buckfield, Hebron and Livermore. Prices ranged last year from \$2.40 down to 25 cents per barrel."

A letter from South Hancock, Hancock county, says:

"I will give you my most careful estimate in answer to your inquiries. I should judge that there were about 5,000 barrels of apples raised in our county last year. Probably the greater part were consumed in the county and there were as many more imported. There were about 1,000 barrels of apples raised in this town last season and about one-half of them were sold to other towns. The principal varieties in this vicinity are the Red Astrachan, Stark, Baldwin, King and Northern Spy.

"The best selling variety is the Baldwin. Our market is principally Bar Harbor and other seashore towns and villages in the county. None are sent to Europe from this section. My views on apple culture are that the best results can only be obtained by thorough care and culture of the orchard. We realized, net, about \$2.50 per barrel for No. 1 apples last year. Apple raising is receiving more attention each year in this county. Hancock, Franklin, Sullivan and Lamoine are considered good apple towns."

A letter from Monmouth, Kennebec county, says:

"Monmouth is a good apple town; Winthrop and Litchfield adjoining are good apple towns. The Baldwin is the principal apple raised, with the Ben Davis a close second. As an all season apple the Baldwin is the best seller, and the Ben Davis is the next best in its season. Our market is everywhere where apples are sold. Many car lots are sent from this town across the water. Some are sold in Boston. Several shipments were made to Baltimore last season. Some are sold to agents who come here from Europe every year. One man in this town raised 1,100 barrels last year mostly Baldwins. Not much ac-



count is made here of early apples. All kinds are raised in small lots and find a ready market in Boston.

"Quite a lot of russet apples are raised in the northeastern part of Monmouth, commonly called Monmouth Neck. The soil in this part of the town, extending also into Winthrop, seems to be natural russet soil, being impregnated with copperas. In regard to the price of apples, I think that large lots averaged about \$2.00 net per barrel for winter fruit last season. Some of our largest apple growers shipped their apples to Europe on their own account. Spraying is practiced here to some extent with good results.

"I think greater care should be taken in sorting and packing apples, especially if they are to be shipped to Europe. Such apples should be pressed very hard; if for Boston or other near markets, not so hard. Only the best fruit should be sent across the water. For a small dealer I think the best time to sell is to the first buyer who makes a fair offer. I have only a small orchard of about 200 trees, mostly Ben Davis. I gave it a thorough cultivation until it came to bearing age, and now I shall raise such crops as clover or buckwheat, and turn these under in the late summer or early fall. There are not many large orchards in town, but a goodly number of small ones, ranging from 200 to 500 trees each."

An apple raiser in New Gloucester, Cumberland county, writes:

"In regard to culture, I practice clean cultivation with some hoed crop for the first 15 years. By that time the trees will have driven out all other crops and then only a harrow can be used. With me apple raising has been profitable, as I have been fortunate in my sales. I have shipped apples to Europe for a number of years and have found a good market for them.

"I have never set an orchard on a piece of land that was producing anything. I have always taken rough pasture land, or land that was covered with stones, or an old cider apple orchard. I would clear such land and then make my new orchard, so that I claim that nearly worthless land can be made to be worth from \$300 to \$500 per acre.

"As to varieties, the market must govern that matter. The Baldwin is the great commercial apple. Nothing has ever been found to equal it. The prices vary from week to week every year, sometimes as much as 50 or 75 cents, so that I can give no opinion as to the average. I sold last year in Liverpool and my average for the season was \$2.21 net at the station after paying all bills for packing, etc. In 1901 I sold at the station for \$3.20 net. In 1900 my net price was \$2.25. One word more in regard to varieties. The great majority of my trees are Baldwins; then I have the Nodhead, Pound Sweet, Northern Spy, Ben Davis, Stark and a few Gravensteins."

An apple raiser in Pittsfield, Somerset county, writes as follows:

"I have interviewed a member of one of the principal apple buying firms in this section and he tells me that the leading varieties raised are the Baldwin, Greening and Spy. The King is the best seller and the Baldwin ranks next. The market in Pittsfield and vicinity is not the best, it being too far from any city.

"The above mentioned firm packed and shipped direct to Europe 1,000 barrels by way of Boston. There were about 2,000 barrels shipped away and I should estimate that they were one-half of the apples raised in town.

"Apple raising is increasing in this vicinity. My opinion is that apple raising is not a profitable business when they are less than one dollar a barrel. Canaan is a good apple town, but Skowhegan is better. I consider Pittsfield as about an average apple raising town.

"Should advise hand picking and to market as soon as they are packed. When obliged to keep them, cold storage is preferable. The cost of storage and the shrinkage is quite an item in preserving apples.

"Personally the Ben Davis has been the best selling and has yielded the most of any apple I raise. The King and the Spy are shy bearers and the Russet wilts."

A gentleman living at North Bridgton, Cumberland county, writes in part as follows:

"I saw a gentleman this morning that last fall shipped from this and other towns near us 8,500 barrels of apples. He says that the Baldwin is the leading apple raised and shipped. The market is Portland and Boston and the shipments are about equally divided between the two. Many of the apples raised in this vicinity are shipped to Europe, some from Portland and some from Boston. There were about 5,000 barrels of apples shipped to Europe from Bridgton last season. It is my judgment that apple raising is increasing rapidly. Denmark, Lovell, Waterford and Harrison are good apple towns; Brownfield and Fryeburg not so good. Some of the best apples in this section are raised in Lovell."

A letter from Orono, Penobscot county, says:

"There were probably 650 barrels of apples raised in this town last year, of which number between 300 and 400 barrels were sent to Bangor and Boston markets. The prices ranged from \$1.00 to \$3.00 per barrel. A few barrels were sold for \$3.50.

"The methods of culture should be plenty of food and thorough cultivation among the trees with plough and harrow. It

does not hurt trees to work up the soil among them until September, then let them alone so that the soil may settle down firmly, thus preventing the fall rains, especially the late ones, from soaking down, thus causing heaving by frost through the winter and spring months.

"In regard to picking, in the first place throw apple pickers, so called, to the winds or upon the brush pile, except the hands, and those hands that know what they are doing. Those apple pickers on poles are made to sell, the same as any other humbug. They destroy more fruit buds for the next year than the fruit they gather is worth. There is only one way to pick fruit, and that is with the hands.

"In regard to packing, only the best fruit should be packed, and it should be perfectly sound and good, free from jams or bruises. If packed in barrels, there should be a laying of paper on bottom and top and the barrel should not be headed up until late in the fall or in the early winter. The best of all plans is to wrap all the apples in fine tissue paper, and it pays to do so, especially the fine varieties. Apples packed in this manner will sell on sight at any time.

"As to varieties, there are already too many varieties for profit, and year after year a few more humbugs appear that beat all the rest until they show up their pedigree, such as Bismark, Gideon and numberless others of royal blood, in the eyes of the originators and to the regret and injury of the purchasers. The best sellers are the Northern Spy, Baldwin, Rhode Island Greening, Granite Beauty, Gravenstein, Ramsdell Sweet, Hurlburt, Poughkeepsie Russet, Wine and Rome Beauty.

"You ask if the apple industry is increasing in this section. I want to call your attention to a subject that is not generally understood, even by buyers of trees. I refer to the trees that are sold by agents on the road. In ninety-nine cases out of a hundred, agents do not know what they are selling, any more than the buyers know what they are getting. Nearly all the trees sold by agents are on slips of roots, not on whole roots from seeds, and in every sense of the word are worse than worthless. There should be some remedy against the selling of such stock. Trees are dug up and the roots are cut up into slips of from five to seven inches in height, and a bud or scion, as the case may be, inserted into the growing end. These slips are then put into moist sand or soil until spring. This work is done during the winter months. In the spring these slips are set out into very rich soil and a forced growth is maintained for two years. They are then sold for trees three and four years old. I could refer you to an orchard of one thousand trees of this stamp, set one year ago, which had to be cut back to live wood, from two inches above ground to eight inches. In riding through the county you have probably noticed many trees

that have been set from one to two or three years, which are leafless and dead. These trees were grown from slip roots. I think that the State should appoint inspectors to examine nursery stock, whose duty should be to discard all such stock and not allow it to be delivered or sold here."

A gentleman residing in Dexter, Penobscot county, writes as follows:

"The market for apples raised in Dexter and vicinity is Boston principally. No apples are shipped from Dexter to Europe. The principal varieties raised in this section are the Baldwin, King, Rhode Island Greening, Stark, Golden Russet, Ben Davis, McIntosh Red and Bell Flower. The best sellers are Baldwin, Rhode Island Greening, Stark and Ben Davis. Last year the prices realized in this vicinity were about \$1.50 per barrel.

"In regard to methods of culture, my views are that, in order to produce the best results, orchards should be set on high land, there should be clean culture and close pruning; and I should mulch with straw or anything to keep down grass or weeds. Apples should be picked by hand and should be sorted closely. Apple growers are using bushel boxes to some extent for packing and shipping apples.

"Apple raising is increasing in Dexter and vicinity quite rapidly, and it is a profitable branch of industry in this section. Some of our best dessert apples are Nodhead, McIntosh Red, Bell Flower, Russian Transparent, Snow, Nonesuch, Golden Russet."

A letter from Leeds Center, Androscoggin county, says:

"Apple raising in this section is increasing fast. The rocky hillsides of worn out or abandoned farms could be utilized profitably for apple culture, and would make the farms more valuable than ever. In my opinion the best varieties of apples are the Baldwin, Northern Spy and King."

An apple raiser in Warren, Knox county, writes as follows:

"I took your letter to the grange last night and asked the members some of the questions, with the following results: In the old orchards in this vicinity the old fashioned Russet is found more than any other kind. In the newer orchards are found the Spy, Greening, Baldwin, Golden Russet and Ben Davis. In orchards just set are found the Arctic, Black Ben Davis and Gravenstein. There are also found the Red Astrachan, Yellow Transparent, Fameuse, King and many others.

"The best sellers for fall are the St. Lawrence, Gravenstein, and Red Astrachan, in the order given. The best winter sellers are the King, Spy, Baldwin and Fameuse, in the order named. For local markets we have the granite cutting town of St. George, and the lime burning towns of South Thomaston, Rock-

land, Warren, Camden and Thomaston. This is a good apple raising section and we ship many apples to Boston and New York, and many carloads to the South and West. Large quantities are bought up by shippers who come around to the farmers and buy their apples for shipment to Europe. The best apple towns in this vicinity are Union, Warren, Appleton, Waldoboro, Washington, Rockport, Camden and Hope. More apple trees are being set now than ever before in this section, more of one or two kinds and less varieties.

"One of the largest raisers of apples in this town says that apple raising pays him better than any other crop. In regard to methods of culture, the trees should be set not less than 30 feet apart each way and for most varieties 35 or 40 feet would be better still. The ground should be cultivated while the trees are young and will do best if ploughed and harrowed every year.

"Most money is made when the apples are packed in the orchard and shipped at once for a fair price. In this vicinity, when apples are to be kept in the cellar for some time before selling, it is found best to buy lime casks to pack them in. They should be headed up and the casks placed on their sides in the cellar. When the apples are sold they are placed in new, full-sized barrels, and the casks are hooped up and sold to the lime people, bringing within one or two cents of what they cost. The cask holds two bushels and one peck, while the regular barrel holds two bushels and three pecks. The apples keep better in the new casks, they are lighter to handle, and then we have clean, new barrels to pack the apples in for market. In this vicinity we sell largely to the buyers who come around and engage apples for Europe."

From Standish, Cumberland county, we have the following:

"The crop of apples in this town last year was a very large one, but I cannot give you an estimate that would be very reliable. The average price received was about \$1.75 per barrel. The increase in orchards in this town is not great, but there are a few new orchards just coming into bearing. The Baldwin and Spy are as reliable as any varieties that we have. The Ben Davis is selling well at present but I expect to see it give way to fruit of better quality.

"In my opinion the growing of apples can be made very profitable here in Maine, and any soil that will grow corn and potatoes will grow apple trees. In regard to packing apples, I would pack only first class fruit and keep all seconds out. For nice fruit I have received the best prices in Boston, and I think it would be better to cater for a high class trade in our home markets rather than depend on the foreign markets. To obtain the best results, an orchard should be cultivated, pruned, fertilized and sprayed thoroughly."

An enthusiastic apple raiser in the town of Newburg, Penobscot county, says:

"Apple culture has increased in this vicinity at least 25 per cent within the last three years. I believe that money invested in orchard property, if handled aright, will pay 25 per cent on the investment. All the abandoned farms with heavy soil, and some with light soil, could be made to yield profitable returns if used for apple culture.

"My opinion is that the Ben Davis and the Wealthy are the very best apples to grow in this part of the State. There is no business in this State into which a young man can enter, with the same amount of capital invested, that will pay as well as orcharding. There is a royal road to competency in the State of Maine, by way of the apple tree."

A letter from a gentleman in Cherryfield, Washington county, says:

"I cannot give you an estimate of the quantity of apples raised in Washington county, because for the most part they are used and sold in the towns where they are raised. Very few apples are shipped in and the county now raises nearly all the apples it consumes. Some of the best apple towns are Cherryfield, Columbia, Columbia Falls, Addison, Charlotte, Pembroke, Dennysville and Cooper.

"The common varieties raised are the Wealthy, Baldwin, Northern Spy, Milding, Ben Davis, Fameuse, Duchess, Red Astrachan, Alexander, Yellow Bell Flower and Talman Sweet. The best sellers are the Milding, Baldwin, Alexander and Yellow Bell Flower. No apples are shipped to Europe from this county.

"In regard to methods I should say, prepare the ground by planting and thoroughly cultivating some hoed crop for two or three years. Set trees out 25 or 30 feet apart and cultivate between them, planting potatoes, beans, etc., until the trees nearly shade the ground. Then sow down some crop to be ploughed or harrowed in and then keep on harrowing.

"Apples should be picked carefully, sorted carefully, and packed in one bushel boxes, the thinner skinned being wrapped in tissue paper. An organized effort should be made to raise enough of one variety in a locality, selecting the kind of course that will do best, to attract buyers. This will make selling certain and will save commissions.

"Apple raising is profitable and increasing, and the soil and climate of Washington county are adapted to it, especially in the second tier of towns from the coast. The Milding, introduced from New Hampshire some three years ago, is said to come nearer perfection here than in New Hampshire and is the most popular apple in this vicinity."

A letter from Waldoboro, Lincoln county, says:

"Apple culture in this county is increasing fast; more trees are set each year than in the preceding year. Waldoboro, Jefferson, Nobleboro, and Damariscotta, in my judgment, are the best apple towns, although some other towns may be nearly or quite as good. Towns in the interior produce more and better apples than those on the seaboard.

"A few years ago, people set all winter varieties, as fall varieties did not bring as good prices. But last season fall varieties brought the most money. My Gravensteins sold in Boston for \$3.00 per barrel, Wealthy and Fameuse for \$2.50 per barrel, when picked from the tree, while Stark and Ben Davis sold in May for \$1.75 per barrel, and Baldwins for \$2.00 per barrel. Now people are turning again to fall varieties. If I were to set an orchard now, I would set one-half Gravensteins. They will sell in Boston in any season for \$3.00 per barrel and in some seasons for more. The Wealthy, McIntosh Red, Fameuse and Ballister are also good selling varieties. For winter varieties I would set Baldwins and Starks, for they are the best keepers and the best sellers.

"As to methods of culture, I would select a lot of hard, rocky land upon a side hill, sloping south or east. I would plough, manure and plant the same for one or two years, and then set the trees 30 feet apart each way. I would fence the orchard in with a hen wire fence and then put in 200 hens to the acre. The hens will fertilize and do all the culture needed, and will also destroy all the insects. On my 200 trees I have seen no tent caterpillars this season, and the curculio is unknown where hens roam. In my orchard there is but one kind of insect, the railroad worm, so called. A small fly lays the eggs and the hens are unable to get at them.

"One of my neighbors commenced orcharding twenty years ago and has since set his whole farm out with fruit trees. It was an old worn out farm that did not produce more than one ton of hay to the acre. He now has a splendid young orchard, the largest in Waldoboro, and his trees are loaded with fruit every season, the varieties being Stark, Ben Davis, Wealthy, Fallawater and King. He also has a peach orchard and last year he raised many bushels of peaches, as large and nice as can be raised in Delaware.

"The most of the apples raised in this county are sent to the Boston market by the producers, although there are buyers each season for other markets. Some apples are sent to the West and some to Europe. I send all my apples to commission merchants in Boston and am usually satisfied with the prices obtained.

"The most discouraging thing in apple culture in this vicinity is the railroad worm. These pests cannot be reached by spray-

ing as yet, and in some seasons, generally the off years, they render the whole crop worthless. People would set more trees every year if it were not for this pest."

An extensive apple raiser at South Paris, Oxford county, says:

"Apple raising is increasing rapidly in this vicinity. I should say that it had increased 10 per cent in the last 5 years. I consider the Baldwin, Ben Davis, Ganno or Black Ben Davis and the Gravenstein the best sellers.

"In regard to methods of culture, orchards should be cultivated thoroughly. I buy wood ashes from Canada and use them liberally in my orchard. I also turn my hogs into the orchard and they generally stir up the soil sufficiently. Orchards should be sprayed when necessary. In order to raise good apples of deep red color and rich flavor, the soil must have potash and this is supplied in abundance by hard wood ashes, spread around the tree, as far outward as the branches extend."

Mr. J. I. Libby of the Portland Fruit Company is a veteran in the exportation of apples to Europe, having been engaged in the business since 1858. In an interview with him in the summer we secured the following facts and suggestions in regard to the shipment of apples to Europe, also in regard to methods of culture, picking and packing apples.

"During the first few years of the exportation of apples, probably not more than a thousand barrels were shipped annually. The prices paid to producers were from \$1.25 to \$3.00 per barrel, and the prices received were about the same as now. The freight rate was from two to three shillings per barrel. Baldwins and Russets were the principal apples shipped at that time. The quantity of apples exported has increased from a few thousand barrels to millions of barrels annually, and shipments are increasing yearly. The foreign trade in apples has tended to increase the production in the State of Maine enormously. The best sellers in Europe, in my opinion, are the Baldwin, King, Newtown Pippin and Golden Russet.

"The best apple counties in Maine are York, Cumberland, Oxford, Franklin and Kennebec. Many Maine apples are sold in the South and West, but not so many as in Europe. In the year 1900 we sold 25,000 barrels in the South and West, and about the same quantity in Europe. I consider apples the safest and most profitable crop that farmers can raise, aside from the crops that they must raise.

"In regard to methods for making the crop surer, I should say more cultivation, trees farther apart, potash or other alkali in more liberal quantities, spraying to prevent rust and the ravages of insects.



"In regard to picking and packing apples, I would say that apples should be handled as carefully as eggs. They should be packed closely in perfectly clean boxes or barrels, and they should be of the same size and quality throughout.

"In regard to buying apples, the best way is to send out agents who will go right into the orchards and superintend the work of picking, packing and shipping.

"In regard to the bulletins from the experimental station at Orono, and the Pomological Department at Washington, there should be some more effective means of getting this valuable information disseminated among apple raisers. Apple raising is a branch of industry that requires all the skill that can be acquired by reading, observation and experience."

#### APPLE RAISING IN AROOSTOOK COUNTY.

There were 64,989 apple trees in Aroostook county in 1890 and 169,258 in 1900, an increase in ten years of 104,269 trees. The first settlers in Aroostook county, especially in the valley of the Aroostook river, made little attempt at fruit raising. More extended attempts to raise apples in the county were made about forty years ago, but the results were not encouraging. Such of the trees as lived bore inferior or worthless fruit.

In the year 1875 a hardy variety, known as the Duchess of Oldenburgh, was introduced from New Brunswick, and this was the beginning of successful apple raising in northern Maine. The Duchess ripens several weeks later in Aroostook county than in the southern and western parts of the State, and in some years it has been found profitable to ship this variety from this section to Boston. A few years ago Mr. John W. Dudley sent 26 barrels of Duchess apples from Presque Isle to Boston and they netted him \$4.00 per barrel.

The Duchess was followed by other varieties, such as the Alexander, the Fameuse, and, in 1882, the Wealthy. A little later the Tetofsky, the Yellow Transparent and the Montreal Peach were introduced, and in 1890 Dudley's Winter was added to the list. Dudley's Winter was raised from seed of the Duchess in 1880 by John W. Dudley of Castle Hill, and it has proved to be one of the most profitable apples that has been raised in the county so far. Other varieties that have done well here are the Stowe, Lady Sweet, Monroe Sweet, and Longfield.

The late Hon. James Nutting of Perham was one of the pioneers in commercial orcharding in Aroostook county. He experimented with a great many varieties and was forced to discard many as not hardy enough for this climate. Among those discarded were the Peabody, Greening, Red Astrachan, Pewaukee, McIntosh, Haas, Mann, Early Russian, Talman Sweet, Northern Spy, King and Ben Davis. The varieties that stood Mr. Nutting's tests were Dudley's Winter, Wealthy, Duchess, Alexander and Fameuse.

In 1892 the Maine Agricultural Experiment Station undertook the introduction of hardy varieties into this region, and these were placed in Mr. Nutting's hands to test. Some of these varieties promise well, such as the Arthur, Okobena, Patten Greening, McMahan, Longfield, Prolific Sweet and Ostrakoff.

At the meeting of the Maine Pomological Society at Bangor in 1891, it was predicted that within ten years Aroostook county would not only raise its own apples, but have a surplus for export. That prediction has come true. For several years apples have been shipped out of the county from Caribou and Presque Isle; in 1899 Robinson Brothers of Presque Isle shipped out 1,500 barrels.

Apples are now raised in almost every town in the county, but the best apple towns are Sherman, Mapleton, Castle Hill, Washburn, Perham and New Sweden, to which may be added the plantations of Chapman and Wade. It seems to be demonstrated that almost every farmer in Aroostook who will can raise apples enough for his own use and have some to spare. The hilly towns seem best adapted for apple raising, and a wind-break is an absolute requisite of success.

In the southern portion of the county, in the towns of Houlton, Hodgdon, Littleton, Monticello, Linneus, New Limerick, Oakfield, Smyrna, etc., there are many fine orchards, and more varieties of apples are raised than in the northern part.

The late Parker P. Burleigh of Linneus was an enthusiast in regard to the cultivation of fruit, and was not only a successful raiser of fine apples, but also of many small fruits, such as blackberries and raspberries. During one season Mr. Burleigh sold over 60 bushels of cultivated blackberries from his farm in Linneus.

## REPORT OF D. H. KNOWLTON.

By the kind permission of the Secretary of the Maine Pomological Society we are enabled to present the following valuable paper on apple culture in Maine, to which the author gives the subjoined title:

Report of the Chairman of the Fruit Committee from Maine, made to the American Pomological Society, at its triennial session held in Boston, Sept. 10, 11 and 12, 1903, made by the Chairman, D. H. Knowlton of Farmington.

"The first settlers who came to Maine were largely employed in lumbering, shipbuilding and the fisheries. As the settlements increased more or less interest was developed in agriculture, until it was learned by actual experience that farming, as a business, in and of itself, was a profitable occupation.

"With some of the earliest settlements seeds were planted and from these grew healthy, vigorous apple and pear trees. These in due time bore fruit in abundance and thus it became known that these fruits could be grown in the new State or Province. Little by little grafting and budding were practiced, so that long before railroads, some of the most delicious apples and pears were grown for the use of the family. As soon as the railroad opened up markets for farm products, the sale of fruit began, not on a large scale, but just like the sale of other crops on the farm, for it was soon learned that any fruits which could be matured in our climate were as successfully grown here as elsewhere.

"In 1873 a few men who realized the desirability of growing more fruit in the State organized the Maine State Pomological Society. Nothing but the enthusiasm of these men kept the society in existence for the first ten years. The membership was small, and the five hundred dollars received from the State was never enough to run the society. But these devoted men freely gave their time and often paid their own bills in order to bring the society into touch with the people.

"Later the State increased the stipend to one thousand dollars per year, which, with the amount derived from membership fees and our permanent fund, has placed the society on a solid financial basis, although there are many ways in which the society could do much more to promote the interests it was created to

represent. It has won the confidence of the State, and although it has never had a large membership, it has been a most valuable medium for promoting the fruit interests of the State.

"The society has held an annual meeting and exhibition of fruit without interruption since its organization. The annual meetings have steadily grown in size of attendance and exhibits, so that the accommodations necessary for such meetings will permit the holding of them only in the larger towns. Papers and addresses have been presented by our best local talent, and in recent years we have been able to call in from other states men and women of national reputation.

"For several years we held successful exhibitions in connection with the State Agricultural Society, whose fairs, like your triennial meeting this year, came too early to show our commercial fruits to the best advantage. Then again the agricultural society was necessarily so conspicuous on these occasions that our officers became convinced that it was not for the interests of the society to continue joint exhibitions, so that in recent years the Pomological Society has been absolutely independent of all other organizations. The society in recent years has been doing its best work, and in addition to its annual meetings, there were held last year two one-day meetings, and a two-days horticultural school. This year we held our first field meeting with great credit to ourselves and great profit to fruit growers. Thus the society has become the leading agency in the State for looking after the general interests of fruit growing and the dissemination of information bearing upon the subject. With the cordial good feeling towards the society and the desire of the people to know more of the hows and whys of fruit culture, the future usefulness of the society is full of promise.

"Another agency that deserves mention in this connection is the Experiment Station at Orono. Since its establishment work has been carried on that is proving of great value to this State. It has tested many varieties of fruit and all the time presents to those who visit the station the very best object lessons in culture and care. The officers have been active in our interests and have ever been ready to impart information, examine insects and other plagues, and to assist at our meetings. The best point of

all this is that the station work, now well organized, promises far greater results in the future.

"Climate and soil conditions in Maine are very favorable for apple culture. Rarely are trees or fruit injured by either frost or the cold of our winters. The fruit when matured is high colored and of unsurpassed keeping qualities. Portland is the chief point within the State from which apples are sent to Europe. Vast quantities of Maine apples are also shipped from Boston to Europe. It is only a short haul from the orchards in western Maine to Portland.

"Another factor that has a decided bearing on apple culture is the low price at which orchard lands are available for the purpose. It takes a few years longer for trees to come into bearing, but when grown they have the best staying qualities and endure for many years.

"I have no great confidence in the statistics that purport to measure the extent of the fruit industry in Maine. It has been increasing rapidly but at the same time there are very few who are making it a business. There are few large orchards, the largest in the state containing about 6,000 trees. Perhaps this in some measure may be due to the effort of our Pomological Society to encourage every one in the State who has a piece of land to raise fruit enough for his own use. There are very few land owners now who do not raise fruit enough for home use, with more or less to sell. At the same time the society has kept constantly before the public the commercial side of orcharding.

"The apple crop in Maine in 1896 was estimated as high as one million five hundred thousand barrels, but this estimate included everything grown, while the marketable crop would not probably reach more than one-half that amount.

"From data which I consider as nearly accurate as any available, I fix the quantity of apples sent out of the State in recent years as follows:

For the year ending June 30, 1900, 420,000 barrels.

For the year ending June 30, 1901, 677,000 barrels.

For the year ending June 30, 1902, 580,000 barrels.

For the year ending June 30, 1903, 500,000 barrels.

"These figures include only the marketable grown fruit. The figures obtained from Portland may show a much larger

export than the above, but it should be remembered that Portland is one of the chief shipping ports for apples sent to Europe, and large quantities of fruit come from Canada for this purpose.

“Evaporating apples has been carried on to some extent by some of the large growers, but to our shame it must be said that most of the evaporated apples sold in Maine are put up in New York. The field here is open yet. Many apples are canned and the industry has proved profitable. Jellies have not been made in large quantities, but in recent years there has been a marked increase in this direction among farmers’ wives, many of whom have become experts in the manufacture of these delicacies. Some of them have been unable to supply the amount called for.

“Since the last Boston meeting of the society there has been an increased interest in fruit culture, spraying, cultivation and handling of fruit, and papers upon these subjects awaken lively discussion at our meetings and lead us to the conclusion that fruit growers are studying these problems for themselves, and while they are sometimes slower than we might wish, they are steadily progressing.

“It may be interesting to know that fruit growing in recent years has been extended fully a hundred miles north of what was supposed to be the northern limit when the society met last in Boston. Aroostook county now produces more apples than it consumes, and of hardy varieties there is promise of much development in the future.

“In the culture of the small fruits there is great promise, which is best shown by what a few are doing in raising strawberries. No statistics are available but the industry is assuming great importance at many points in the State.

“The transportation of our fruit has been discussed more or less at our meetings. The railroads are serving the people well and there is little complaint on their account, but of the steamer service that transports our apples across the Atlantic, the most growers know but very little. When word comes back that apples are ‘slack,’ or otherwise in poor condition, it is all a mystery. A barrel of apples was sent to Liverpool with others; at the same time another barrel of apples was sent to Chicago. The barrel that went to Liverpool reached its destination nearly three weeks earlier than the other. The freight on the barrel to

Liverpool was 59 cents, and on the barrel to Chicago, \$1.05. But the growers themselves have not given this matter much thought as yet, most of the fruit being sold to some local buyer. Our nearness to market is a strong factor in our favor. What we most need is better handling and care of fruit in transit.

"The packing and storing of our fruit are constant problems and are still on the program. It is our misfortune that so much Maine fruit goes to market poorly packed. This has often been charged to the buyers, but it is an all-round fault. There are many growers who are careful in handling their fruit, and they are well rewarded for their labor. There are others who do not know how much they are losing by their indifference to this matter. If the American Pomological Society can improve this condition it will be a great boon to Maine.

"The storage problem meets us today as never before. Its importance is great. The apples sold in Maine are largely in comparatively small lots, from 25 barrels up to 3,000 barrels. Buyers sometimes have storage houses of their own, but the great majority of growers have only the ordinary house cellars, and when the apples are picked from the trees they must quickly dispose of them. They are literally at the mercy of the buyer in consequence, and are obliged to sell for what they can get. There is an imperative need of some extensive plan of commercial storage of fruit. The writer believes that neither ice nor chemicals are necessary for this purpose. If only the growers could, in some way, unite in the construction of large storehouses near shipping points, the question would be in the way of solution.

"Prof. Munson reports that the cultivation of the blueberry at the Experiment Station is still receiving attention, and that it is their purpose to get together all the different species which promise good results. One species has already proved profitable and Mr. Geo. W. Spaulding of North Anson has made a commercial success of this species.

"The blueberry industry in Maine represents a value of from \$100,000 to \$150,000, annually, but Prof. Munson very properly says of this industry that it is largely a matter of management rather than of culture. His investigation warrants him in saying: "There is unbounded opportunity for the development of this industry in the western part of the State, until it shall rival in importance and extent that of Washington county.'"

## SUMMARY.

The following table will show the number of apple trees in 1900 and the number of bushels of apples raised in 1899 in the State of Maine, by counties :

Counties.	Number of trees.	Bushels raised.
Androscoggin .....	395,365	118,668
Aroostook .....	169,258	60,274
Cumberland .....	328,499	172,750
Franklin .....	456,085	46,838
Hancock .....	71,804	30,625
Kennebec .....	509,687	145,654
Knox .....	97,340	67,938
Lincoln .....	115,038	60,825
Oxford .....	482,664	120,682
Penobscot .....	369,423	133,831
Piscataquis .....	121,649	48,827
Sagadahoc .....	84,380	38,738
Somerset .....	309,169	85,155
Waldo .....	253,688	111,905
Washington .....	62,804	32,415
York .....	358,128	146,648
Total .....	4,184,781	1,421,773

Apple culture in Maine is a large, important and growing industry. According to the United States Census, as shown in the above table, the number of apple trees in the State in 1900 was 4,184,781, against 3,003,109 in 1890, an increase of 1,181,672, or 39.3 per cent, in ten years. The yield in 1899 was 1,421,773 bushels, or a fraction over one-third of a bushel to a tree, while the yield in 1889 was 3,071,471 bushels, or a fraction over one bushel to a tree, thus showing the yield in 1889 to be three times as great per tree as in 1899. The crop of 1896 and that of 1902 were both excessively large, while in some other years the crop was very meager. The quantity of fruit produced in any year is determined largely by the nature of the season. Consequently comparisons between the crops of the years mentioned are of little significance.

The value of all orchard products in the State in 1899, including pears, peaches, plums and cherries, as well as the value of all cider and vinegar manufactured from apples, is given as \$833,643. Reckoning on the number of apple trees, which was 97.9 per cent of all orchard fruit trees, and making due allowance for the value of cider and vinegar, the approximate value of the



apple crop for that year would be \$800,000, which would be a fraction over 56 cents a bushel, or an income of 19 cents per tree. This will strike the average reader as a very meager yield, but by a little investigation it will be found that it is not far below the average of the country. It must be remembered that 1899 was an off year in Maine, when the crop was only one-fourth or one-third that of some other years, while in several of the states the yield was from one to two bushels per tree. Again, while census figures do not specify the value of the apple crop separately but give the value of all orchard products, if we make a calculation on the total number of all orchard fruit trees and the value of all orchard products, we shall find that in 1899 the value of the product per tree in Maine was  $19\frac{1}{4}$  cents, while in the whole country it was  $22\frac{3}{4}$  cents.

The value of all orchard products in Maine, as given by the census reports for other decades, is as follows: 1850, \$342,865; 1860, \$501,767; 1870, \$874,560, or reduced to a gold basis, \$699,648; 1880, \$1,112,026. We are unable to find any value given for the product of 1890. About 98 per cent of the above figures represents the value of apples.

Except as above mentioned no figures are given by the United States Census in recent years in relation to the apple crop of Maine, either as to the number of trees, the number of bushels or the value of the crop, and so far as we are aware the Department of Agriculture at Washington has never issued estimates of the apple crop as it has of hay, grain, potatoes and even many minor crops. Without a careful estimate covering a series of years, no very close figures can be given of the average number of bushels raised in the State, or their average value. It is to be regretted that no such figures are available.

Rough estimates of the apple crop of Maine since 1890 vary for different years from 800,000 bushels to over 4,000,000 bushels, but these estimates are of no practical value in determining the importance of the apple crop as a producer of wealth in our State.

In comparison with other states, we find Maine excelled by few in the increase of the number of trees between 1890 and 1900, and those few mostly in the West. From all sections of the State the universal testimony is that apple culture is on the increase and that more and more trees are set each year.

The keeping qualities of Maine apples were amply demonstrated at the World's Fair in Chicago in 1893, also at the Pan American Exposition in Buffalo in 1901. Maine apples never received better advertisements than were given to them at these two fairs, on account of the rich color of the fruit and its wonderful keeping qualities.

The Baldwin apple still maintains its preeminence and seems to grow in favor as the years go by. The tendency at the present time seems to be to cultivate fewer varieties than formerly, and the best and most successful apple growers report not more, usually, than three or four varieties and very seldom mention a half-dozen at most. Besides the Baldwin, the Ben Davis, Rhode Island Greening, Roxbury Russet, Golden Russet, King, Northern Spy, Wealthy, Gravenstein, Stark, Fameuse, McIntosh Red and Bell Flower seem to be mentioned most frequently in the returns sent in to the Bureau, but each section has its favorites, and these must be determined by circumstances of climate, soil and market.

All apple growers with whom we had interviews or from whom we received letters agreed that thorough cultivation of the land on which the young orchard is set should be maintained for several years, and nearly all favored the raising of some hoed crop. All agreed that the land should receive the proper amount of orchard food, and that potash is an essential food in raising fine apples. Some are obtaining good results from the application of wood ashes to the land.

Some apple growers turn their hogs into the orchard and let them do the stirring of the soil, and one reports that he encloses his orchard with a high wire fence and puts in 200 hens to the acre. From these various facts and suggestions, apple growers will undoubtedly derive some useful hints.

All successful apple raisers agree that spraying the trees is necessary in most if not in all cases. One apple grower thinks there should be State supervision of the sales of nursery stock, in order to guard farmers and orchardists against the buying of worthless stock.

The exportation of apples to Europe from Maine has grown from very humble beginnings to large figures, and last season amounted to over 500,000 barrels. This trade has stimulated

apple culture greatly and the end is not yet. We now have so direct, quick and safe communication with Liverpool, the great apple market of the world, by means of ocean steamers from Portland and Boston, that this trade is likely to increase rather than diminish, especially if favorable freight rates are maintained. It would seem as though Maine apples could be shipped from Portland as advantageously as from Boston; and if they can, our apple growers and shippers should certainly give their own port the preference.

All apple growers seem to agree in regard to the carefulness that should be practiced in picking and packing apples. The Canadians are ahead of us in packing apples. The barrels in which their apples are packed are almost invariably new, clean and neat, while many of our apples are packed in flour barrels, more or less old, and oftentimes with the heads covered with the old, dirty and disfigured labels designating the brand of flour the barrel formerly contained.

The practice of packing apples in boxes, containing one bushel each, seems to be growing in favor and in time may be the universal custom. The wrapping of apples in tissue paper, especially those of the tenderest and choicest varieties, is another practice that should be commended highly. It pays to pick apples carefully and pack them honestly, making the package of the same size and quality throughout. The neater the barrel or box and the more carefully the apples are packed, the more readily they will sell and the higher will be the price.

All apple raisers agree that the industry is a safe and profitable one, paying a good percentage on the investment. All agree, also, that our worn out or abandoned farms could be utilized successfully for orcharding, and that Maine might become one of the most successful apple producing states in the Union.

The Maine Pomological Society has done most noble work in encouraging and promoting fruit culture in our State, and it deserves the gratitude of all who desire to see the success of one of the most useful and beautiful industries in the world, that of fruit growing. The best fruit exhibit ever made by this society was displayed at Auburn hall, Auburn, at their meeting held November 11, 12 and 13 of the present year.

## THE DEVELOPMENT OF MILLINOCKET.

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Four years ago last May there were a farm house, a barn and several out buildings, with a few acres of cleared land, within the bounds of what is now the town of Millinocket; with this exception the whole region was an almost unbroken wilderness. Through this wilderness the Bangor and Aroostook railroad had been built, passing within a mile and a half of where the village of Millinocket now stands. There was a station near the crossing of the Millinocket stream, called Millinocket, but the building was so small that, when the development of the place required larger station accommodations, it was loaded upon a flat car and hauled away. Now there is a duly organized and well governed town of about 3,000 inhabitants, with nearly all the privileges and conveniences found in well regulated cities. The history of the development of Millinocket, like that of Rumford Falls, reads more like romance than reality, but the history of both shows what Maine might become, were her water powers and other great natural resources developed to their full extent.

### THE PENOBSCOT RIVER AS A GREAT WATER POWER.

The West branch, which is really the main upper Penobscot river, rises in the northwestern part of the State, in a region that varies from 1,600 to 2,200 feet above the sea level. It flows a little south of east for a considerable distance, passing within 2 miles of the northern part of Moosehead lake. It then turns northward and flows into the northerly end of Chesuncook lake. From the southerly part of this lake the river flows in a southeasterly direction passing through Ripogenus, Ambajejus, Pemadumcook, North Twin, Elbow and Quakish lakes, receiving also the waters of several other lakes on the way. A few miles below Quakish lake it receives the waters of Millinocket lake through the Millinocket stream, and about 10 miles farther

along, at Medway, it unites with the waters of the East branch, or more properly the Mattagamon river, the outlet of Mattagamon lake. Twelve miles below Medway the waters of the Mattawamkeag river, coming from the east, join the united forces of the West and East branches, thus forming Maine's largest and noblest river, which now takes a southerly direction to the sea.

The Penobscot, from the confluence of the Mattawamkeag to the open sea, is 120 miles long; from the junction of the Mattagamon or East branch, 132 miles; from the extreme head waters, about 260 miles, or, including the local windings, 300 miles.

The total number of streams tributary to it in its whole course is 1,604. The total number of lakes and ponds connected with the system, as shown on the State map, is 467. The river basin comprises an area of 8,200 square miles, which is considerably the largest river district contained wholly within the State.

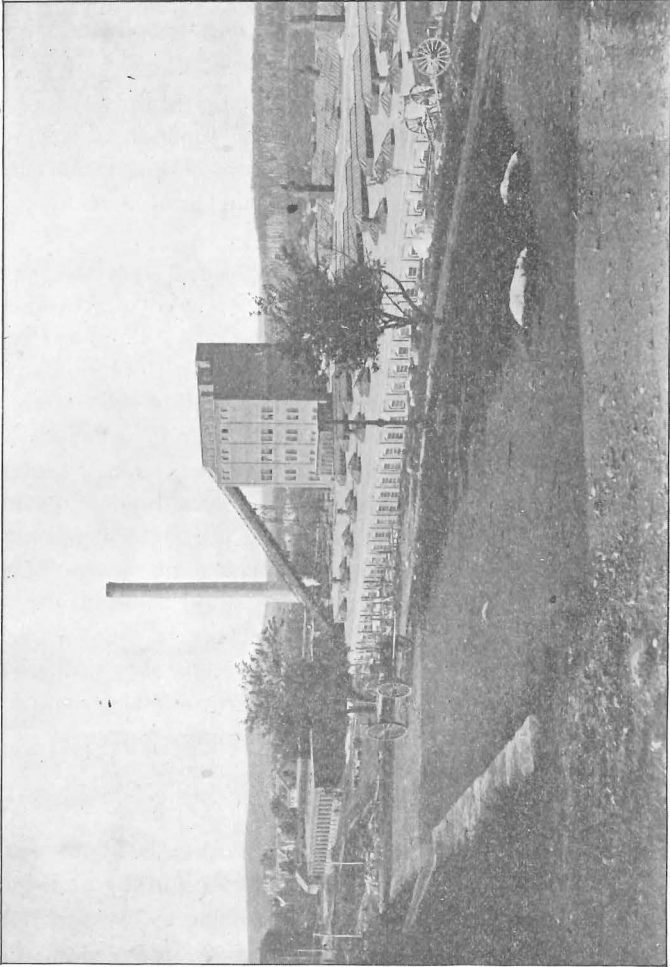
The main water power section extends from Chesuncook lake to Bangor, 120 miles, the fall being 900 feet. The Penobscot naturally, and without the assistance of man, holds a position among the most highly favored rivers of the State in respect to uniformity of volume at different seasons of the year. This is due partly to its extensive system of lakes and partly to the vast breadth of forests upon its drainage surfaces. If we take 224 of the principal lakes connected with the system, they will give a grand total of 462 square miles of reservoir surface, nearly the whole of which is susceptible of use for storage purposes.

#### THE WATER POWER AT MILLINOCKET.

The water power developed at Millinocket is about 20,000 horse power, but with the present facilities for the storage of water in the lakes above, this power is liable to be impaired in times of drouth. In fact the present year, on account of the meager rain fall since the annual spring freshet, there was a shortage of water late in the season, and on November 24 the plant was obliged to shut down a large part of its machinery for many weeks.

The legislature of 1903 passed a bill allowing the West Branch Driving and Reservoir Dam Company to build dams for water

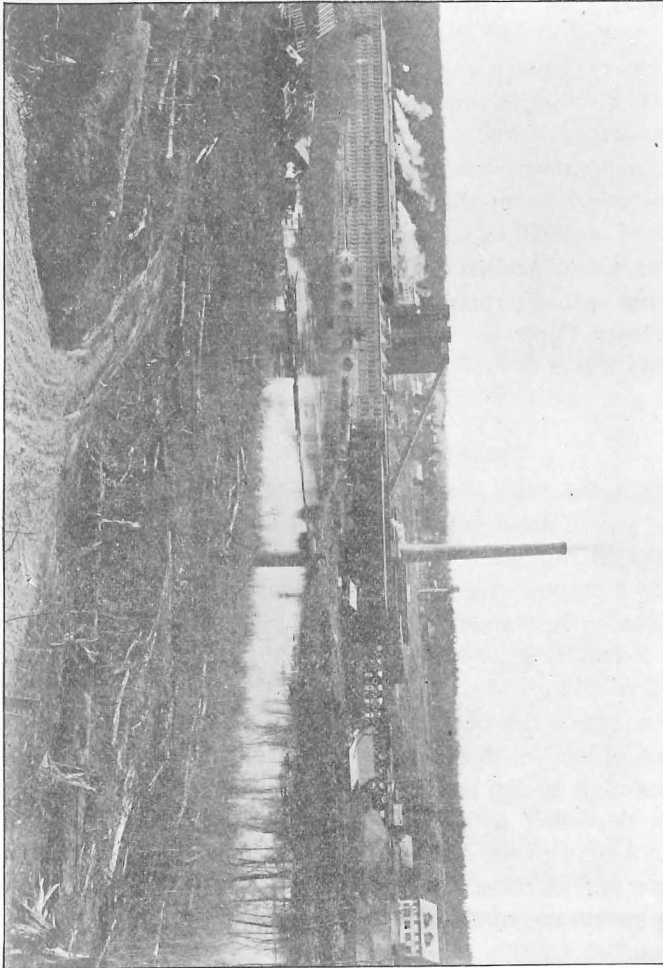
storage purposes at the outlets of North Twin lake and Chesuncook lake. Work has been going on during the past summer on the dam at North Twin lake. This will be raised 5 feet higher than the old dam, so that it will be possible to draw down the



THE PULP AND PAPER PLANT DURING CONSTRUCTION.

water in Pemadumcook and North and South Twin lakes 21 feet in times of drouth. The dam at the outlet of Chesuncook lake will be raised 6 feet, and when this is done all liability of a scarcity of water under any ordinary circumstances will be removed.

Some years ago one or two shrewd and practical business men discovered that the Penobscot river, just below the Twin lakes, was a hundred feet or more higher than the Millinocket stream, which empties into the river a few miles below Quakish lake. They also discovered that the land between the river and stream



THE PULP AND PAPER PLANT COMPLETED.

consisted, for the most part, of a large bog, and that by means of a canal it would be feasible to divert the waters of the Penobscot, make them flow through the canal to the Millinocket, a mile and one-half away, and then, after they had done their

work in turning the wheels of a great industrial plant, return again to the river.

The course of the two streams, by following the Penobscot from the foot of Quakish lake in a southerly direction, then east-erly and northeasterly until the mouth of the Millinocket is reached, then following up the Millinocket in a northerly direc-tion to the site of the pulp mill, is in the form of an ox bow. Across the open end of this bow, from the foot of Quakish lake to the Millinocket stream, the canal is built, which consists, first of a section of the canal which empties into an artificial pond, then a continuation of the canal to the approach to the penstocks, from which point the fall is obtained. This work will be de-scribed in detail as we proceed.

Mr. C. W. Mullen of Bangor was the originator and promoter of this vast enterprise, and he was the first clerk of the Great Northern Paper Company, the corporation that has planted and reared this industrial town in the wilderness of Maine.

#### THE CANAL AND ARTIFICIAL POND.

About 80 miles from Bangor, the Bangor and Aroostook rail-road passes through that portion of the wild lands known as No. 3, Indian Purchase. The farm house and cleared land referred to on a previous page were located on a school lot in the eastern section of the township and occupied by Mr. Charles T. Powers. On February 23, 1899, by authority of a resolve of the legisla-ture of Maine, the State land agent sold to Mr. Powers from the northern tier of school lots, the whole of lot No. 77 and so much of lot No. 78 as lay on the west side of Millinocket stream, amounting to 249 acres, for the sum of \$186.75, and the same was deposited with the State treasurer to the credit of the school fund of the township. On account of their location, the ownership of these lots by the Great Northern Paper Company was necessary in the development of the water power at this point.

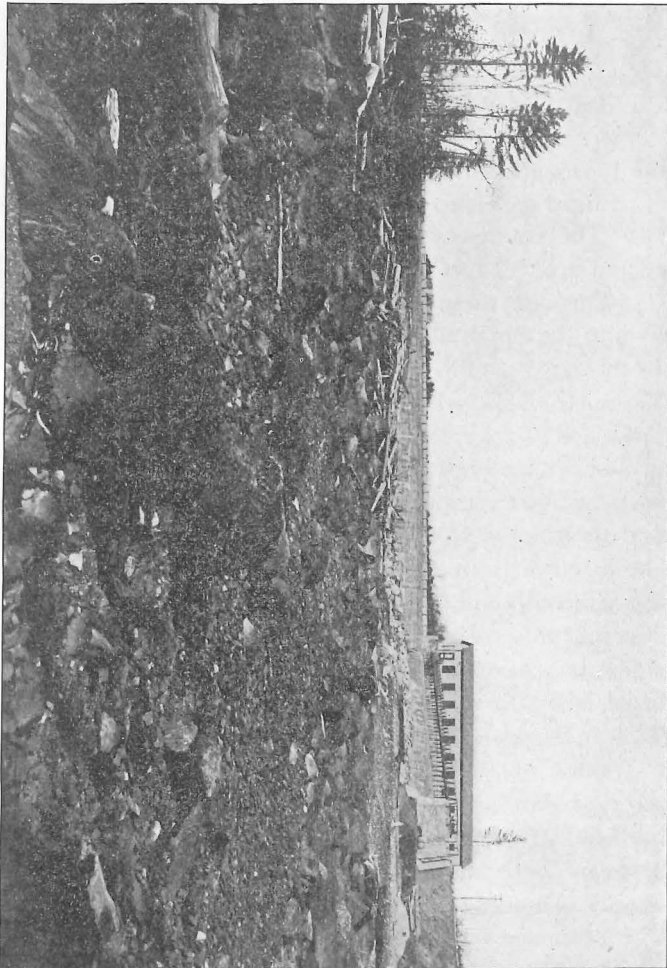
The company bought not only Mr. Powers' land, but all the available land in the immediate vicinity between the Penobscot river and the Millinocket stream, also the land bordering on the west bank of the Penobscot. The whole tract purchased by the



company comprised about 1,800 acres and included the land where the great mill and the village of Millinocket have since been built.

The first work in the development of the great industry was done on the 15th of May, 1899. A temporary dam was thrown

WHERE THE PENOBSCOT WATERS ENTER THE CANAL.



across the Penobscot river at the outlet of Quakish lake, thus forcing the water into another channel, and then the work on the permanent dam was commenced; at the same time workmen were scattered all along the line of the great canal and the construction of this artificial river and pond was begun.

The permanent dam across the Penobscot is about two and one-half miles below the North Twin dam and is a most substantial structure. It is built of concrete, but not exactly of the kind that we are accustomed to see in sidewalks. The concrete used in its construction was composed of one part cement, two parts sand, and five parts crushed granite. The granite and sand were found in the immediate vicinity, and this is true of all the granite and sand used in all the dams, head gates, dikes, foundations, etc., connected with the whole enterprise.

The dam is 1,200 feet in length; the maximum height is 25 feet, the maximum width at the base is 24 feet, and the width at the top is about 8 feet. At the east end of the dam there is a set of head gates, 10 in number, which admit the water to the canal. The frameworks of these head gates are built of concrete and are  $7\frac{1}{2}$  feet wide and 11 feet high. The gates are of steel. Through these gateways the water from the Penobscot flows into the canal, filling the artificial pond on its way, and so on to the great plant.

Just north of these head gates is a sluiceway, 12 feet wide, for the passage of logs to the artificial pond. From the artificial pond a sluice made of planks extends down the long slope to a small pond near the pulp mill, and through this sluice logs are sent at the rate of 20 to 30 a minute during the day.

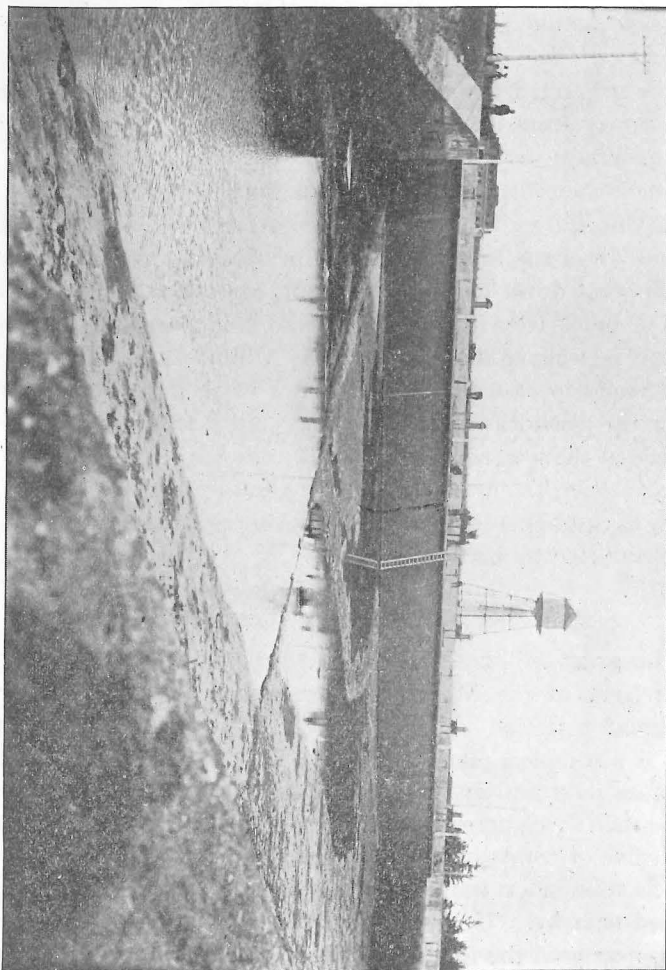
The distance from the head gates at the foot of Quakish lake to the artificial pond is 1,800 feet. This pond, used for storing and sorting logs, contains about 250 acres, the bottom of which is a peat bog mostly, with a few elevations that now appear as little islands. From the artificial pond to another set of head gates near the eastern end of the canal, the distance is 1,400 feet. The frames of these gates are of steel anchored to concrete. Their aggregate area is a little more than the area of the gates at the head of the canal.

Between these eastern head gates and the approach to the penstocks is a section of the canal, which, by closing the gates, can be drained of water, thus enabling workmen to enter the penstocks for repairs, etc.

The canal, both above and below the artificial pond, is 75 feet wide at the bottom and from 100 to 125 feet wide at the top, and 14 feet in depth. The tops of the banks are 5 feet above high water level, and the sides of the banks slope 2 to 1, that is,

for every foot in perpendicular height the slope measures 2 feet. The banks of the canal are paved with cobble stones up to the water level inside, while the outer side is rolled and seeded to grass.

WHERE THE WATER ENTERS THE PENSTOCKS.



A series of dikes had to be constructed in places to confine the waters of the artificial pond, and these, which aggregate a mile in length, are all 5 feet above high water mark and 12 feet wide on top. The slope is 2 to 1 like the canal banks. The banks of the dikes are rip-rapped with cobble stones.

There are five penstocks already in use and a blank end for a sixth when it is needed. Each penstock has a gate in front of it, also a rack for catching sticks and other debris. From the penstock gates to the wheels is 1,100 feet, with a fall of 110 feet. The penstocks are buried in earth and are supported by concrete saddles. It required 1,700 tons of steel to make the penstocks. Four of them are 10 feet each in diameter and the power generated from them is used entirely in grinding wood. The power from the other, which is 11 feet in diameter, is used for generating electricity.

The water, that has come from the Penobscot through the canal and the artificial pond to the gates of the penstocks which extend from the brow of the hill overlooking the valley of the Millinocket down to the great plant, has traversed the distance of  $1\frac{1}{2}$  miles from the parent stream, and stands at the height of 110 feet above the waters of the Millinocket. This water is now ready to rush through the gates when they shall be lifted, enter the penstocks, and, descending 110 feet, strike the turbine wheels at the lower end of the penstocks with almost irresistible force, setting the machinery of the great plant in motion, and then, having done its work, pass into the Millinocket stream and thus find its way back to the river.

#### DESCRIPTION OF THE PULP AND PAPER PLANT.

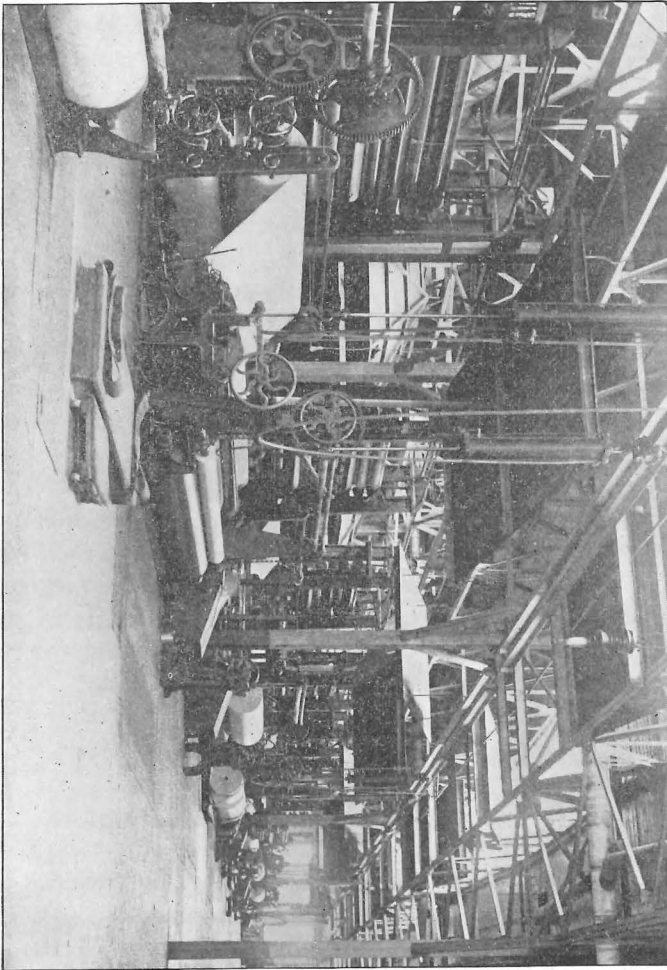
The great Millinocket pulp and paper mill is located on the west bank of the Millinocket stream some over a mile from Millinocket station on the Bangor and Aroostook railroad. This mill is a complete plant, comprising a ground wood pulp mill, a sulphite pulp mill and a paper mill. The whole plant covers more than seven acres, that is, there are seven acres of buildings, exclusive of courts and yards, belonging to the plant.

The foundation walls of the mill are of granite which was obtained near by. The piers on which the columns rest, the spill way, nearly all the floors and some of the partition walls are of concrete, made in the same manner as the concrete used in building the dam. The walls are of brick. In their construction and in the erection of the chimney 10,000,000 brick and tile were required. They were all brought in over the Bangor and Aroostook railroad. The chimney of the boiler house is prob-

ably the tallest chimney in the State, being 235 feet in height. The base is 22 feet square and built of concrete, while the chimney itself is built of German tile and has a 12 feet flue.

The size of the different rooms composing the plant is as follows: machine room, 290 by 240 feet, one story and basement;

FRONT ENDS OF PAPER MACHINES.



finishing room, 290 by 100 feet, one story; train shed, 290 by 50 feet, one story; beater room, 290½ by 72 feet, one story and basement; screen room, 209 by 100 feet, two stories and basement; grinder room, 211 by 174½ feet, one story; generator

room, 174½ by 51 feet, one story; sulphite plant, 218 by 115 feet, one story and basement; storage building, 82 by 62 feet, one story and basement; boiler house for coal burners, 191 by 76 feet; boiler house for wood burners, 119 by 65 feet; new paper storage room, 216 by 100 feet; wood preparing room, 176 by 125 feet. The filter plant is 51 by 36 feet, one story, and has a daily capacity of 15,000,000 gallons. The digester house is 100 feet high and the equipment includes three digesters, each 16 feet in diameter by 46 feet in height.

The mill first started up in November, 1900, with two paper machines at work. In February, 1901, the whole plant was at work. There are now 8 paper machines running, each 152 inches in width, and the mill is producing 260 tons of news paper daily, and some wall paper.

The paper machines and nearly the whole mill, aside from the grinders, are operated by electrical power generated in the mill itself, and the plant is lighted by electricity. It is protected against fire as thoroughly as a plant can be, and is equipped with the latest and most improved machines used in pulp and paper making.

Besides the 20,000 horse power developed by the water power at this point and used in this great plant, steam power is also used, as it must be in every paper mill as well as in every chemical pulp mill. For generating steam in this plant 40,000 tons of coal are required annually, besides large quantities of wood. Several thousand cords of this wood are shipped each year from Eagle Lake over the Bangor and Aroostook railroad.

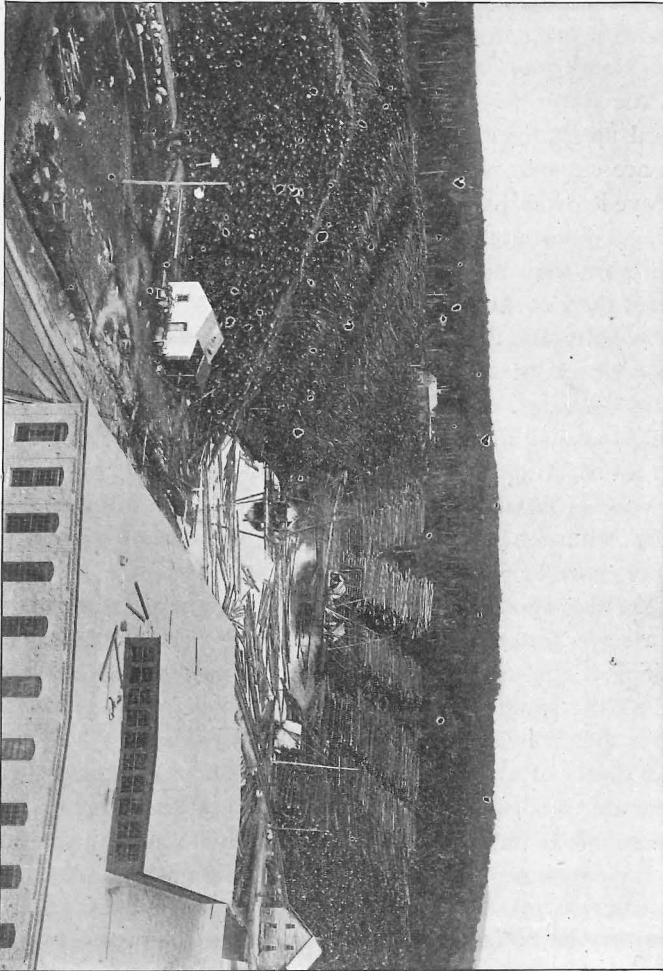
#### WORKMEN AND WAGES.

The number of employes at this plant is about 800. They work in three shifts of 8 hours each, thus making an 8 hour day. The outside men and the finishers are not included in the above arrangement and they work 10 hours a day. The men are paid twice a month and the monthly pay roll amounts at the present time to \$50,000.

## PULP WOOD.

The amount of pulp wood required to supply this mill is from 50,000,000 to 60,000,000 board feet annually. This is cut mostly on land owned by the company.

TWENTY-ONE MILLION FEET OF PULP WOOD.



In the early days of making paper from wood, poplar was supposed to make the best pulp, but spruce is now considered superior to any other wood for this purpose. Other woods, such as hemlock, pine and fir, are used to some extent, but spruce is recognized as the great pulp wood of the world.

## GROUND WOOD PULP.

The process of manufacturing ground wood pulp is as follows:

The logs are hauled into the wood preparing room from the small pond near the plant by means of an endless chain supplied with grappling hooks at intervals. This chain is run on pulleys and goes from the room down over an inclined plane into the water where the hooks grapple the logs and they are hauled up the incline to the wood preparing room. Here the logs are cut into bolts about two feet in length. These are then conveyed to the barkers. The barkers are revolving iron disks having knives along their faces so adjusted that they take a trifle more than the bark from the bolts as these are held against their surfaces.

The bolts are then conveyed to the grinders, which are immense wheels of sandstone, two feet in thickness and about 4 feet in diameter. These grinders are run by water power, and water is also admitted to the tunnels which hold the bolts. The bolts are held against the grinders by pneumatic pressure and the wood is rapidly ground into pulp. There are 60 grinders in the Millinocket plant and they are capable of grinding 250 tons or more of wood pulp in the 24 hours.

After the wood is ground the pulp is conveyed to a tank having a sieve bottom, and here fresh water is turned upon it, washing it through the sieve into another tank and leaving behind all the splinters and unground portions of the wood. The pulp is then conveyed to the wet machines, where it is made into great sheets of about a quarter of an inch in thickness. These sheets are usually subjected to an enormous pressure in order to squeeze out as much water as possible, thus reducing the weight and the expense of shipping. At the Millinocket plant large quantities of ground wood pulp are piled up in the yard, that there may be no lack of pulp in case of accident or a brief shut down of this part of the mill from any cause. Of course when these sheets of pulp arrive at the paper mill, they are re-dissolved.



## SULPHITE PULP.

The process of making sulphite pulp is entirely different from that of making ground wood pulp. The logs are not necessarily sawed into bolts, although the bark has to be removed. The knots are also cut or bored out and the wood is more carefully selected and prepared than in the ground wood process. After being carefully prepared the wood goes to the chipper, where it is cut into fine pieces not larger than shavings from a planing machine. From the chipper the wood goes to the digester, an immense upright boiler of steel. The digesters are nearly filled with an acid made by introducing the fumes of burning sulphur into lime water. When all is ready steam is turned on until the pressure is about 100 pounds to the square inch, and the wood is cooked in the liquor for about 9 hours. The acid under the above pressure has the power to disintegrate the wood, dissolving out of it all the resin, pitch, etc., and leaving nothing but pure wood fiber. After the cooking process is completed the contents of the digester are blown into a vat with a sieve bottom and fresh water is turned on until all the liquor is rinsed out. The pulp is then conveyed to a machine where it is made into sheets of about the thickness of common blotting paper. This is made into large rolls, and in this form it can readily be shipped or conveyed to any point. Like ground wood pulp it is re-dissolved when it reaches the paper mill.

Lime and sulphur enter largely into the production of sulphite pulp, or fiber as it is sometimes called. It is estimated that about 230 pounds of lime and 285 pounds of sulphur are required in the production of one ton of pulp. A portion of the lime used is produced in Maine, from the quarries near Rockland, and probably all of it might be obtained within the borders of our own State. The sulphur, of course, has to be imported, and probably the larger portion of it comes from Sicily.

Both sulphite and soda pulp are often called chemical pulp or fiber. In the soda process of making pulp, which is in use in some of the mills of the State, the liquor is made by introducing caustic soda into lime water, instead of the fumes of burning sulphur.

## PAPER.

The paper manufactured at Millinocket is almost entirely news paper. This paper is made of ground wood pulp and a greater or less per cent of sulphite pulp, according to the quality of paper desired. For news paper stock the usual proportions are 90 per cent of ground wood and 10 per cent of sulphite pulp. For book paper the proportions are more nearly equal. The greater the amount of chemical fiber used the firmer and whiter the paper will be.

## THE BANGOR AND AROOSTOOK RAILROAD.

When the development of Millinocket commenced, the Bangor and Aroostook railroad company immediately built new and more commodious stations, enlarged the yard, laid new tracks, and built a spur track from the main line to the site of the proposed mill. These improvements cost more than \$50,000.

The plant gives an immense amount of business to the railroad, for all the coal, lime, sulphur and other supplies must be brought in by that road, and the finished product must go out over the same road. The product is at present 260 tons of paper daily. This would require a train of about 17 freight cars every day in the year. The railroad facilities are all that can reasonably be desired, and the railroad management has extended every accommodation possible from the very beginning of the great enterprise.

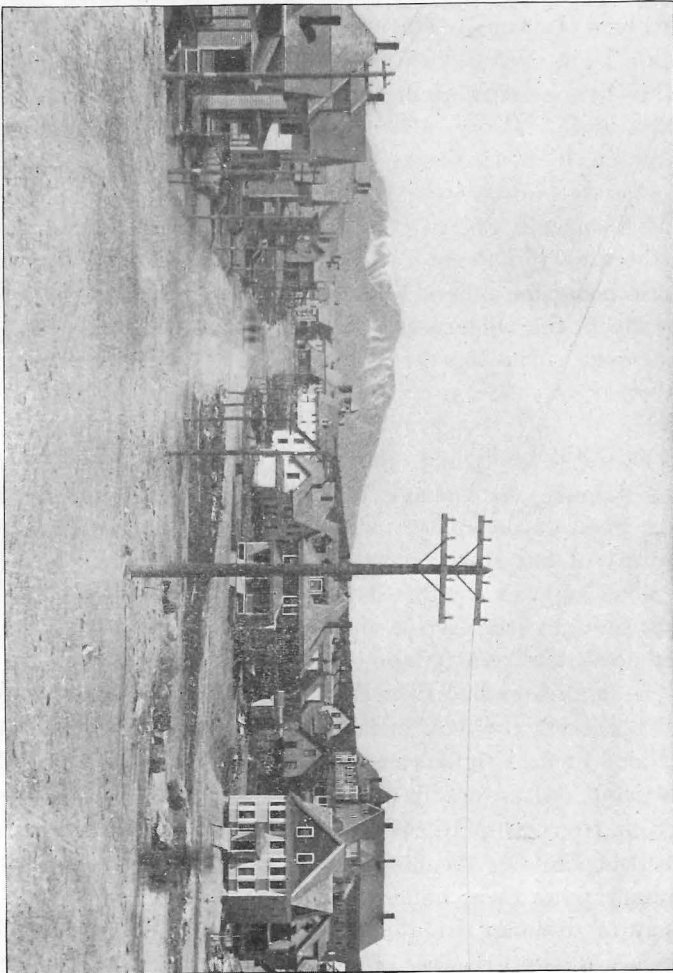
## THE TOWN OF MILLINOCKET.

The town of Millinocket is located in the central part of the east half of No. 3, Indian Purchase, in Penobscot county, and covers approximately one-fourth of the area of the township, the remainder of the township being taxed as wild land. It was set off and incorporated as a town, March 16, 1901. The public school lots of the township, which contained 1,000 acres prior to the sale of 249 acres to Mr. Powers, extending along on both sides of the Millinocket stream, are all located within the boundaries of the town, and the courts have decided that they all legally belong to the new town, thus leaving the re-

mainder of the township without school lands. When a new town is incorporated the title to the school lands always passes from the State to the town.

In 1890 the township contained only 4 inhabitants, while the census of 1900 showed a population of 1,144, and the present

A MILLINOCKET STREET, MT. KATAHDIN IN THE DISTANCE.



estimate is that there are 3,000 inhabitants within the limits of the town.

Millinocket is 83 miles north of Bangor, on the line of the Bangor and Aroostook railroad. The Penobscot river forms

its southern and most of its western boundaries, and the Millinocket stream, running in a southerly direction, forms a junction with the Penobscot near the southeast corner of the town. The town is not without its natural attractions of beauty and grandeur. There are numerous lakes in the vicinity, Millinocket on the north, Ambajejus and Pemadumcook on the northwest, Lower Jo Mary, Middle Jo Mary, Upper Jo Mary, South Twin, North Twin, Elbow and Quakish on the west, all within twelve miles of the village, and numerous smaller lakes to the south. From almost any part of the town, Mount Katahdin, in all its beauty and majesty, is visible, distant about 25 miles in a northwesterly direction.

Millinocket is one of the few incorporated towns in the northern part of Penobscot county, Medway, Patten and Mount Chase being the others. Thus it will be seen that the town is literally in the wilderness. Two important factors led to its settlement. One was the water power, as yet undeveloped, and the other was the existence of the Bangor and Aroostook railroad.

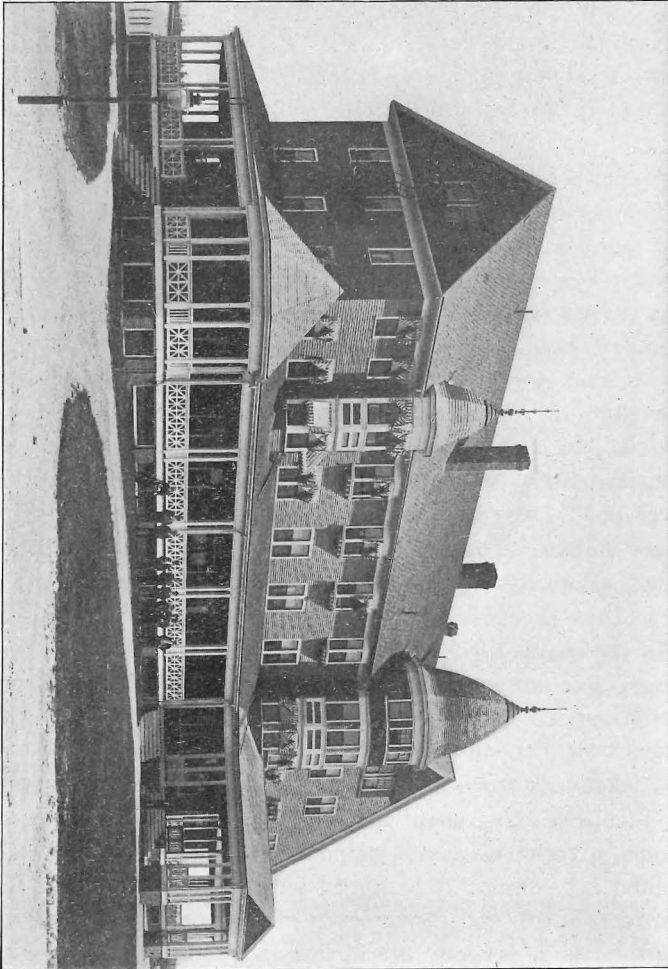
The soil is sandy and thin, and Millinocket will never be classed among the fine agricultural towns of the State, although some good gardens have already been made, and quite a quantity of fair sized vegetables have been raised. Nearly all the food supplies for this industrial community, however, have to be brought from fertile and productive Aroostook, still farther north, or from Bangor and other points south.

The land extending from the great mill to the railroad station and bordering the west bank of the Millinocket stream was all included in the original purchase of the Great Northern Paper Company. It is nearly all elevated land, being a succession of hills from 50 to 100 feet in height. This land affords most excellent sites for dwelling houses and other buildings. In a sanitary sense these building sites are almost perfect. There is natural drainage, and the air on these hills is pure and invigorating.

Quite naturally the first buildings were erected near the mill, but the village has been extending northward, and probably at some time will spread out as far as the station. At the present time, however, as one alights at the station, he sees nothing of the village, it being concealed by the hills, and all he does see

looking south, is the word "Millinocket" in large letters, on a large board supported by two posts erected on the slope of the first hill at the right of the track.

The first buildings were nearly all temporary structures, erected for the purpose of boarding and sheltering the small army of



THE GREAT NORTHERN HOTEL.

workmen engaged in digging the canal, excavating for the foundations of the mill, building the dams and head gates, and all the other preliminary work of this gigantic enterprise. About the first permanent structure was the office building of the com-

pany, erected quite near the mill. This was in 1899, only four years ago. There is no accurate record giving the dates of the erection of other buildings, but gradually the temporary structures gave way to more pretentious and permanent buildings. The company itself erected two hotels and still owns them, namely, the Mountain View house and the Great Northern hotel, while a third hotel, the Windsor house, was built by private parties.

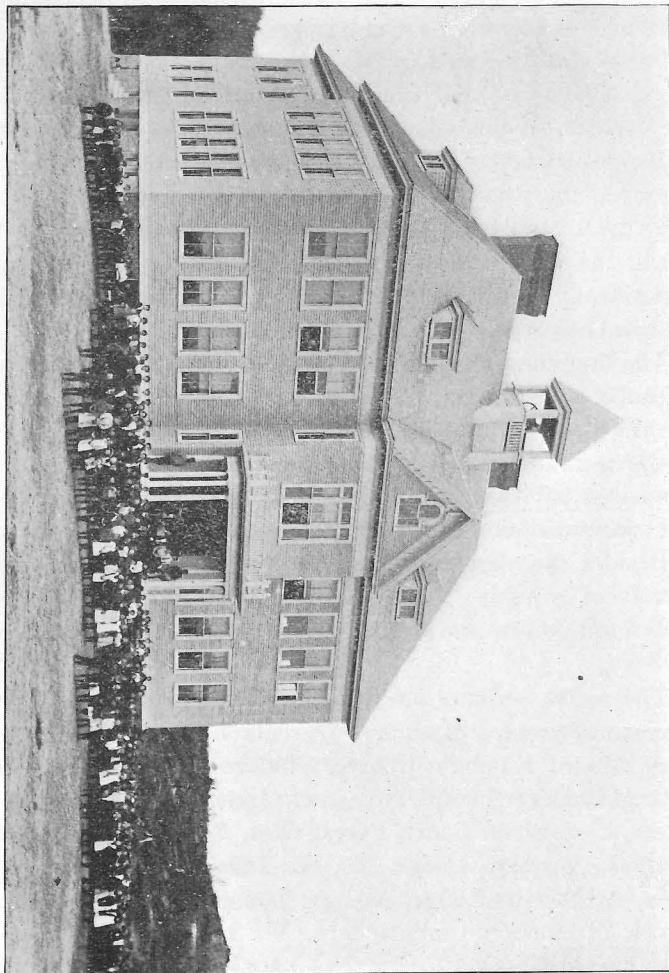
In the year 1900, stores began to appear and dwelling houses multiplied rapidly, and the little village began to assume symmetry and comeliness. There has been no reaction or set-back, but a steady, healthy growth from the outset.

The town has large, neat and comfortable dwelling houses, and many of them, in architectural beauty, would do credit to any town or city in the State. It has one hardware store or firm that carries on plumbing in all its branches, one tin smith and plumber, two drug stores, three grocery, meat and provision stores, one general store, one bakery, one boot and shoe store, five clothing stores, two dry goods stores with millinery connected, one jewelry store, three confectionery and fruit stores, one department store, one furniture store, three barbers' shops, three hotels, several boarding houses, one restaurant, and three livery stables. There is also a good photographer, and his fine views, taken during the development of the plant, give a good idea of the progress made in the building up of the town.

In the matter of education the new town is abreast the most progressive and enlightened towns in the State in school accommodations, trained teachers and school supervision. In 1901 a large, well planned and convenient school building was erected and was ready for occupancy on January 6, 1902. This building, all furnished, cost about \$20,000. It has seven large school rooms, a recitation room, principal's room and library, all well lighted and admirably arranged with special reference to the comfort, health and convenience of teachers and pupils. All the schools at present are in this building, but smaller school buildings will have to be erected at once, as all the rooms have as many pupils as they can accommodate.

The schools are finely graded, and the high school has a course of study as comprehensive as any high school in any town

of equal size in the State. The first graduation from the high school was in June, 1903. The whole number of children of legal school age in the town is 806. The whole number in the schools during the past year has been over 400. The people are evident-



THE MILLINOCKET SCHOOLHOUSE.

ly trying their best to put into practice the suggestion of President Roosevelt, in the matter of raising large families.

The first religious service in Millinocket was held on July 9, 1899, in a camp or shack, and was attended by a few earnest people. On the following Sunday a service was held in the new and

unfinished Windsor hotel. On following Sundays of that year services were held sometimes out of doors and sometimes in shacks or camps, according as the weather was pleasant or not.

As no one religious denomination was numerous enough to build a place of worship by itself, the different denominations combined and erected a building known as Union Chapel. This building was dedicated in December, 1899. The directors of the Great Northern Paper Company subscribed \$200 each to aid in the erection of this chapel, while some funds were contributed by distant friends of the movement, and the people of Millinocket made up the balance of the sum required. Religious services were held regularly in this chapel until the summer of 1903, when, the several denominations worshipping here having become strong enough to erect houses of their own, the chapel was sold and has been converted to other uses.

The first church edifice to be erected in the new town was the Catholic, built in 1900; the next was the Episcopal, built in 1901; the third was the Baptist, built in 1902; and the fourth was the Congregationalist, which is not yet completed. These are all handsome buildings and they seem to be adequate at present for the accommodation of the church going people of the place.

Besides the clergymen supplying the pulpits of the various houses of worship, Millinocket has other professional men in sufficient numbers for present needs, such as lawyers, physicians, etc.

The secret societies already established here are as follows: Free and Accepted Masons, Nollesemic Lodge; Royal Arch Masons, Mount Katahdin Chapter; Independent Order of Foresters, Millinocket Lodge, No. 4,117; Independent Order of Foresters, Companion Court, Forest Glen, No. 488; Knights of Pythias, Northern Lodge, No. 60; Independent Order of Red Men, Ambajejus Lodge, No. 57; United Order of the Golden Cross, Millinocket Commandery, No. 227; Loyal Orange Institution, Millinocket Lodge, No. 384; Loyal Orange Ladies Institution, No. 116; Modern Woodmen of America, Millinocket Camp, No. 10,851; Knights of Columbus, Saint Martin's Council, No. 680; New England Order of Protection, Katahdin, No. 359; American Benefit Society, Millinocket, No. 179; K. O. T. M., Katahdin Tent, No. 29; I. B. of P. M.



The labor organizations are as follows: International Brotherhood of Paper Makers; Pulp, Sulphite and Paper Mill Workers; International Brotherhood of Local Firemen.

A banking and trust company has been granted a charter, with a capital stock of \$50,000, most of which has been subscribed.

The Millinocket Journal is an enterprising four page local paper, published every Saturday by the Millinocket Printing Company. Mr. E. E. Morse is the editor and manager. The first number was issued, November 9, 1901.

The Millinocket brass band was organized in the summer of 1903.

The whole number of polls in the new town is 884. The valuation of the town is \$647,247. The rate of taxation for 1903 was 29 mills on the dollar.

The amount of money raised for the support of schools in 1903 was as follows: for common schools, \$2,000; for free high school, \$800; for school books and supplies, \$700; for repairs on schoolhouse, \$500. The amount of money raised for all purposes was \$19,017.07.

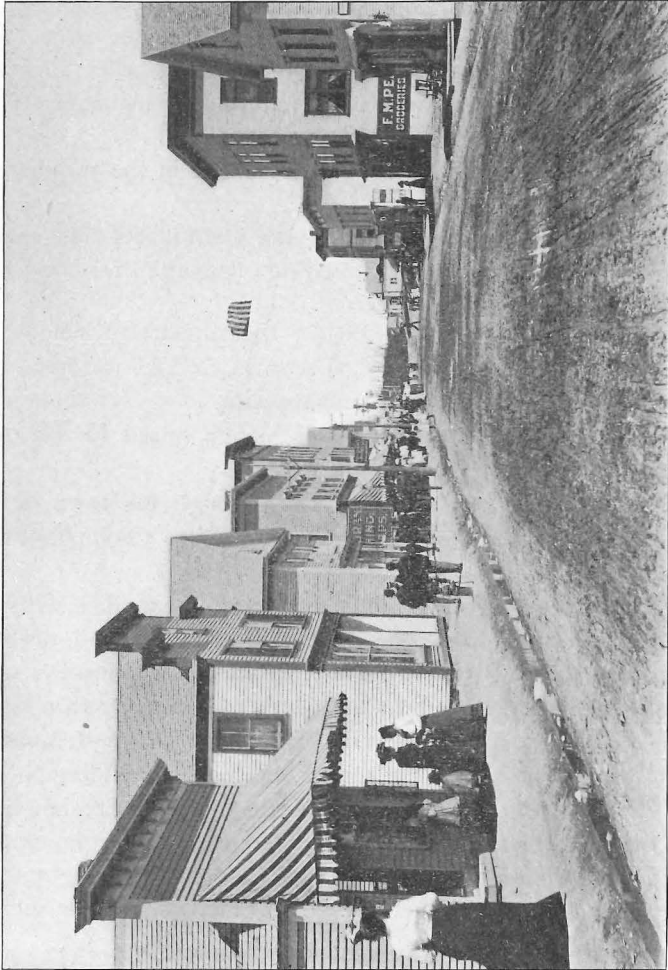
Millinocket has some fine streets, although the town is deficient in the matter of sidewalks as yet. It has a complete sewerage system.

For protection against fire the village is supplied with 30 hydrants, and the water comes from the artificial pond, or Ferguson lake, as it is called. The hydrants are connected with the powerful steam pump at the paper mill where steam is always kept up, so that at a moment's notice heavy streams of water can be thrown to the top of the highest building in the village. The pulp and paper plant including the office building, the Great Northern hotel, and the Mountain View house, all owned by the Great Northern Paper Company, are lighted by electricity generated at the mill. The remainder of the village is lighted by acetylene gas.

For public meetings, town meetings, entertainments, etc., there is a spacious pavilion, which, at present, seems to meet all requirements.

On the eastern bank of the Millinocket stream a village called "Little Italy" has sprung up on one of the public school lots which belongs to the town. The Italian laborers in quite large

numbers have "squat" upon these lands, and have built here their modest homes. The town has not interfered with them very much, although they have no title to the land on which their houses stand. They are not damaging the land, for there



A BUSINESS STREET IN MILLINOCKET.

is nothing there to damage, and probably they will not be molested until the land is sold for legitimate building lots, and then the "squatters" will be obliged to vacate.

## THE GREAT NORTHERN PAPER COMPANY.

The officers of the Great Northern Paper Company are as follows:

President, Garrett Schenck.

Vice-president, William B. Dillon.

Treasurer, J. Sanford Barnes, Jr.

Clerk, A. Ledyard Smith.

Directors, Garrett Schenck, William B. Dillon, Payne Whitney, Oliver H. Payne, Edward H. Haskell and R. Somers Hayes.

Resident Engineer, H. S. Ferguson.

Manager of manufacturing department, George H. Parks.

Superintendent, George S. Witham.

Garrett Schenck has been a prime mover in this gigantic enterprise, and to him as much as to any one man is due the credit for establishing in the wilderness of Maine one of the largest, if not actually the largest, paper mills in the world.

H. S. Ferguson, the resident engineer, has been here during the whole development of the plant and has had charge of all the engineering operations. He was formerly at Rumford Falls, as resident engineer for A. B. Tower.

The sales department of the company is in New York and is in charge of William B. Dillon, who was formerly in charge of the sales department of the International Paper Company.

Mr. George W. Stearns is the resident real estate agent of the company, having charge of the selling of building lots on the company's land, and of all matters pertaining to collections, rentals, etc., in connection therewith. He is also superintendent of schools and chairman of the board of selectmen.

About \$3,000,000 were expended at Millinocket by the Great Northern Paper Company before a pound of paper was made. Almost the whole of this vast sum was supplied by Boston and New York parties.

The company owns about 500,000 acres of timber land in Maine, the greater part of which lies along the West branch of the Penobscot river. The company has adopted an inflexible rule, providing that no tree less than 12 inches in diameter, breast high, shall be cut on their lands in Maine. So long as this wise rule is adhered to, there will be no danger of exhausting the spruce supply on the company's lands.

The Great Northern Paper Company, at about the time it commenced the development of Millinocket, bought the pulp and paper mill at Madison, on the Kennebec river, and proceeded at once to entirely reconstruct it. This pulp and paper mill had probably seen as many vicissitudes as any manufacturing plant in the State; but since the new company has taken it, its success has been so great that the town of Madison has received new life and business activity is everywhere apparent.

The mill under its present management is manufacturing 45 tons of sulphite pulp and 50 tons of paper daily. This plant could be greatly enlarged, as the water power here is one of the best in the State. As will be seen, the Millinocket and Madison plants combined are producing over 300 tons of news paper daily, and this great product will undoubtedly be increased in the future.

MAINE RAILROADS.

The following table shows the number of employes (including general officers), in the employ of steam railroad companies in Maine, total wages and average daily compensation, on June 30, 1903, as compared with June 30, 1902.

Name of Road.	Number of employes, 1902.	Number of employes, 1903.	Total wages paid, 1902.	Total wages paid, 1903.	Average daily compensation, 1902.	Average daily compensation, 1903.
Bangor and Aroostook Railroad.....	1,183	1,334	\$569,095 65	\$637,108 16	\$1 89	\$1 92
Boston and Maine Railroad.....	865	857	517,122 95	536,876 22	1 94	1 97
Bridgton and Saco River Railroad*	41	48	19,470 57	21,508 80	1 50	1 52
Canadian Pacific Railway.....	411	461	226,768 46	278,729 63	2 02	2 06
Franklin and Megantic Railway*....	51	61	20,278 03	25,629 77	1 39	1 48
Georges Valley Railroad.....	12	12	5,699 46	5,092 59	1 59	1 34
Grand Trunk Railway.....	610	757	351,533 64	451,227 19	1 82	1 87
Kennebec Central Railroad*.....	15	15	6,968 14	6,901 98	1 59	1 62
Lime Rock Railroad.....	33	43	18,456 41	20,822 22	1 87	2 05
Maine Central Railroad.....	3,274	3,477	1,814,429 26	1,875,896 25	1 81	1 84
Monson Railroad* .....	12	12	5,026 79	5,766 69	1 45	1 57
Phillips and Rangeley Railroad*....	81	94	19,943 08	25,503 92	1 38	1 50
Portland and Rumford Falls Railway	296	332	147,155 17	159,855 14	1 74	1 78
Rumford Falls & Rangeley Lakes R.R.	94	113	36,615 17	55,145 48	1 56	1 62
Sandy River Railroad*.....	45	50	17,852 29	19,807 53	1 50	1 56
Sebasticook and Moosehead Railroad	31	26	7,970 69	8,333 17	1 46	1 30
Somerset Railway.. .....	77	75	38,503 77	37,775 63	1 62	1 69
Washington County Railroad.....	242	214	117,032 11	111,634 57	1 80	1 86
Wiscasset, Waterville & Farmington Railroad*.....	68	93	18,154 68	31,697 05	1 16	1 28
York Harbor and Beach Railroad...	36	37	9,198 21	10,067 59	1 73	1 81
	7,477	8,111	\$3,967,274 53	\$4,325,379 58		

\*Narrow (two feet) gauge.

## RAILROAD EMPLOYES AND WAGES.

The number of employes upon steam railroads in Maine for the year ending June 30, 1903, was 8,111, an increase of 634, and upon the street railways, 1,125, an increase of 123, making the total number of men employed in the railroad business 9,236, an increase of 757 over the previous year.

The total amount of wages paid employes upon steam railroads in Maine for the year ending June 30, 1903, was \$4,325,379.58, an increase of \$358,105.05, and the total amount paid employes upon street railways for the same year was \$553,500, an increase of \$62,391.33, making the aggregate amount of wages paid by both steam and electric railroads, \$4,878,879.58, an increase of \$420,496.38 over that paid the previous year.

The total number of days worked by those employed upon steam railroads was 2,327,137, an increase of 141,118, and the number of days worked by those employed upon street railways was 337,500, an increase of 39,859, making an aggregate of 2,664,637 days worked on both steam and street railroads, an increase of 180,977 days over those worked in 1902.

The average number of days lost among those employed on steam railroads was 25, the average number of days worked was 287, and the average annual income, including the general officers, was \$533, and not including the general officers it was \$522; while the average number of days lost among those employed upon street railways was 12, the average number of days worked was 300, and the average annual earnings, \$492.

The average daily wages of those employed upon steam railroads, including general officers, increased from \$1.81 in 1902 to \$1.86 in 1903, and not including general officers, from \$1.76 in 1902 to \$1.82 in 1903, while the average daily wages of those employed upon street railways decreased from \$1.65 in 1902 to \$1.64 in 1903.

## GROSS EARNINGS AND TRAFFIC IN MAINE.

The gross earnings of steam railroads for the year ending June 30, 1903, as shown by the report of the railroad commissioners, was \$12,658,848.37 against \$11,763,068.86 in 1902, an increase of \$895,779.51, and, compared with 1901, an increase of \$1,728,845.51.

The number of passengers carried for the same year was 6,993,046 against 6,533,660 carried in 1902, an increase of 459,386, and, compared with 1901, an increase of 822,032.

The number of tons of freight hauled for the same year was 9,548,915 against 8,868,303 for 1902, an increase of 680,612, and, compared with 1901, an increase of 1,161,227. From this continued increase in railroad freight traffic it is evident that, from an industrial point of view, the prosperity of the State of Maine is constantly increasing.

#### MILEAGE OF STEAM RAILROADS IN MAINE.

The total mileage of the steam railroads in this State on June 30, 1903, was 2,004.81 miles against 1,933.35 in 1902, an increase of 71.46 miles, and, compared with 1901, an increase of 85.83 miles. The gain for the present year comes from the construction of the Fish River railroad, now owned and operated by the Bangor and Aroostook railroad, 51.00 miles from Ashland junction to Fort Kent, with 4.97 miles of additional branches; the construction of the Madrid railroad from Madrid station on the Phillips and Rangeley railroad to Holman's mills, a distance of 6.40 miles; a change in the line of the Maine Central railroad at Nequasset, .10 mile; and the extension of the Rumford Falls and Rangeley Lakes railroad from Bemis to Oquossoc, 9.99 miles. The Madrid railroad is operated by the Phillips and Rangeley railroad and extends into a lumber section.

Since June 30, 1903, the Eustis railroad has been constructed from a point on the Phillips and Rangeley railroad to Coplin plantation, a distance of about 15.50 miles, and a location has been granted for the building of a branch from the above named road from Eustis junction to Stratton in the town of Eustis, about 6.00 miles. These additional railroads in Franklin county are narrow gauge roads and the principal object of their building is to transport the lumber from that part of the county.

## MILEAGE OF STREET RAILWAYS IN MAINE.

On June 30, 1903, there were 345.16 miles of street railways in operation in Maine. Since that date the Portsmouth, Dover and York street railway has been constructed from York corner to Salmon Falls river, the State line, 9.60 miles, from Greenacre to the above line at Eliot station, 3.33 miles, and from a connection near the river to South Berwick, 5.00 miles, a total of 17.93 miles. The Waterville and Oakland railway, from Waterville to Oakland, 5.32 miles, has also been constructed and put in operation, making a total of 368.41 miles of street railways in operation at the close of the year.

While it has been thought by many that the era of railroad building, both in steam and street railroads, had reached its limit, or that there need not be expected that much more mileage would be added to that already constructed for a considerable time, it is evident from present indications that the extension of the steam railroads will continue to penetrate the great lumber sections of the State and that street railways will find their way from our large centers to many thriving villages and towns needing better communication and more rapid transit.



## THE MANUFACTURING INDUSTRIES OF MAINE.

Compiled from the Reports of the Twelfth Census.

The report of this department for the year 1901 gave a synopsis of the manufacturing industries of Maine, together with a history of ten of the leading industries of the State. From the reports of the Census Bureau we have compiled a table of Maine manufacturing industries, which is a statement in detail of all the manufacturing industries in the State for the census year 1900 with the exception of 1 government establishment, 4 eleemosynary institutions, and 1,649 establishments with a product of less than \$500 each.

The industries included in the compilation consist of 2,895 hand trades and 3,807 other establishments, the volume of each being shown in the following table:

	Hand trades.	Other establishments.
Number .....	2,895	3,807
Capital .....	\$4,662,344	\$118,256,482
Average number wage earners.....	6,692	68,124
Total wages .....	\$3,105,667	\$25,422,182
Cost of materials.....	\$4,995,382	\$63,868,026
Miscellaneous expenses.....	\$553,868	\$7,220,348
Value of products.....	\$11,686,966	\$115,674,519

The hand trades consist of

Bicycle and tricycle repairing.....	57
Blacksmithing and wheelwrighting.....	973
Boots and shoes, custom work and repairing.....	213
Carpentering .....	277
Clothing, men's custom work and repairing.....	178
Clothing, women's, dressmaking.....	163

Dyeing and cleaning.....	11
Furniture, cabinetmaking, repairing and upholstering.....	83
Lock and gunsmithing.....	21
Masonry, brick and stone.....	91
Millinery, custom work.....	270
Painting, house, sign, etc.,.....	247
Plastering and stuccowork.....	11
Plumbing, and gas and steam fitting.....	112
Taxidermy .....	7
Typewriter repairing.....	1
Watch, clock, and jewelry repairing.....	180
Total .....	2,895

## INDUSTRIES NOT PREVIOUSLY REPORTED.

The government establishment, the eleemosynary institutions and the establishments with a product of less than \$500 each, not included in the compilation, were not reported at previous censuses, and were here omitted for the purpose of a fair comparison with the results shown in previous census reports. We give brief statements of each class separately.

*Government Establishment.*

Number of establishments.....	1
Capital .....	\$6,082,965
Average number wage earners.....	559
Total wages paid.....	\$470,248
Cost of materials.....	\$205,012
Value of products.....	\$764,022

*Eleemosynary and Penal Institutions.*

Number of institutions .....	4
Capital .....	\$314,836
Average number of wage earners.....	5
Total wages paid.....	\$2,750
Cost of materials.....	\$88,559
Miscellaneous expenses.....	\$668
Value of products.....	\$101,497

*Establishments With a Product of Less Than \$500.*

Number of establishments.....	1,649
Capital .....	\$606,225
Proprietors and firm members.....	1,725
Average number wage earners.....	295
Total wages paid.....	\$19,286
Cost of materials.....	\$137,658
Miscellaneous expenses.....	\$26,307
Value of products.....	\$390,177
Average product per establishment.....	\$236.61

## AGGREGATES OF ALL MAINE MANUFACTURING INDUSTRIES.

Number of establishments.....	8,356
Capital .....	\$129,922,852
Average number of wage earners.....	75,675
Total wages paid.....	\$29,020,133
Cost of materials.....	\$69,294,637
Miscellaneous expenses.....	\$7,801,191
Value of products.....	\$128,617,181

TABLE OF MAINE

Consecutive number.	Industry.	Number of establishments.	AVERAGE NUMBER OF WAGE-EARNERS.			
			Men over 16 years.	Women over 16 years.	Children under 16 years.	Total.
1	Agricultural implements.....	17	215	2	1	218
2	Awnings, tents and sails.....	39	116	19	-	135
3	Baskets, and rattan and willow ware...	5	80	110	-	208
4	Bicycle and tricycle repairing.....	57	45	-	-	45
5	Blacksmithing and wheelwrighting....	973	448	-	2	450
6	Bookbinding and blank book making...	9	25	33	-	58
7	Boot and shoe cut stock.....	5	8	28	-	36
8	Boots and shoes, custom work and re- pairing.....	213	79	5	1	85
9	Boots and shoes, factory product.....	48	4,346	2,064	22	6,432
10	Bottling.....	13	80	1	1	82
11	Boxes, fancy and paper.....	9	38	149	-	187
12	Boxes, wooden packing.....	28	397	1	6	404
13	Brass castings and brass finishing.....	6	50	-	-	50
14	Bread and other bakery products.....	106	360	126	6	492
15	Brick and tile.....	71	391	-	1	392
16	Bridges.....	3	40	-	-	40
17	Brooms and brushes.....	8	25	15	1	41
18	Carpentering.....	277	1,666	-	6	1,672
19	Carriage and wagon materials.....	4	14	-	-	14
20	Carriages and wagons.....	165	337	1	1	339
21	Cars and general shop construction and repairs by steam railroad companies.	19	571	-	-	571
22	Charcoal.....	3	4	-	-	4
23	Cheese, butter, and condensed milk, factory product.....	61	141	21	-	162
24	Chemicals.....	5	12	-	-	12
25	Cleansing and polishing preparations..	3	5	-	-	5
26	Clothing, men's, custom work and re- pairing.....	178	145	605	1	751
27	Clothing, men's, factory product.....	42	253	1,007	10	1,270
28	Clothing, women's, dressmaking.....	163	9	464	3	476
29	Clothing, women's, factory product.....	9	7	283	-	290
30	Coffins, burial cases, and undertakers' goods.....	10	51	2	-	53
31	Confectionery.....	56	99	140	1	240
32	Cooperage.....	76	154	-	4	158
33	Cotton goods.....	15	6,197	6,760	766	13,723
34	Cutlery and edge tools.....	11	63	-	-	63
35	Dyeing and cleaning.....	11	16	7	-	23
36	Electrical construction and repairs.....	8	15	-	-	15
37	Electroplating.....	4	1	-	-	1
38	Fertilizers.....	3	34	-	-	34
39	Fish, canning and preserving.....	117	2,895	1,746	926	5,567
40	Flavoring extracts.....	10	11	35	-	46
41	Flouring and grist mill products.....	227	192	-	-	192
42	Foundry and machine shop products....	112	2,120	23	-	2,143
43	Fruits and vegetables, canning and preserving.....	59	487	316	101	904
44	Fur goods.....	5	13	13	-	26
45	Furniture, cabinet making, repairing, and upholstering.....	83	115	18	2	135
46	Furniture, factory product.....	14	322	11	1	334
47	Gas, illuminating and heating.....	9	61	-	-	61
48	Hairwork.....	3	-	4	-	4
49	Hand stamps.....	3	5	-	-	5
50	Hosiery and knit goods.....	3	4	31	2	37
51	House furnishing goods, not elsewhere specified.....	5	6	2	-	8

## MANUFACTURING INDUSTRIES.

Consecutive number.	Total wages.	Capital.	Miscellaneous expenses.	Cost of materials used.	Value of product.
1	\$100,033	\$584,247	\$28,430	\$98,197	\$280,261
2	59,339	109,338	6,540	152,631	263,095
3	10,773	9,580	392	2,217	20,925
4	18,236	60,965	8,281	32,731	94,003
5	203,938	856,204	43,585	391,254	1,294,357
6	24,070	33,408	7,332	32,000	82,250
7	5,367	37,249	15,898	78,341	134,981
8	36,040	73,435	16,047	74,134	212,657
9	2,664,672	5,148,278	402,027	8,366,747	12,295,847
10	39,418	167,230	14,050	325,847	430,138
11	54,571	94,746	7,580	98,887	208,250
12	156,966	444,449	31,908	348,021	599,858
13	28,751	119,714	6,026	52,590	119,573
14	213,054	490,861	45,182	643,956	1,204,531
15	162,105	454,953	24,940	106,026	439,975
16	20,600	15,500	1,317	31,753	60,657
17	18,739	23,846	3,784	68,311	113,290
18	890,092	900,627	183,576	1,429,496	3,056,220
19	6,171	36,671	2,889	13,772	30,163
20	173,634	602,773	25,269	274,772	719,859
21	300,775	921,905	35,435	487,604	857,136
22	912	2,690	46	1,200	2,670
23	70,283	429,510	23,065	1,407,050	1,727,684
24	4,928	550,426	2,991	16,758	31,638
25	1,856	10,400	433	2,714	9,750
26	240,558	394,516	53,817	365,856	877,292
27	271,967	443,752	75,749	683,471	1,335,836
28	105,439	138,239	26,538	119,290	353,328
29	72,679	193,050	7,410	154,455	287,749
30	26,654	80,435	3,137	75,539	135,895
31	75,898	174,855	44,235	261,427	512,743
32	57,449	138,548	21,518	114,092	260,973
33	4,330,297	21,087,190	1,440,425	7,036,287	14,631,086
34	21,149	123,667	4,976	29,882	78,476
35	8,830	17,040	3,402	5,642	35,183
36	8,300	17,875	1,328	11,690	27,112
37	325	2,375	430	770	4,550
38	6,990	49,350	2,120	22,190	40,002
39	1,184,850	8,481,056	97,859	2,578,636	4,779,733
40	21,630	80,137	16,283	86,688	168,621
41	93,820	1,235,767	43,836	2,827,443	3,399,832
42	1,036,034	4,032,950	142,334	1,553,168	3,298,706
43	203,509	865,825	43,119	762,102	1,335,671
44	12,939	27,015	3,275	35,085	66,200
45	65,979	162,449	15,952	131,368	307,368
46	127,051	421,836	35,463	284,216	580,737
47	37,958	1,426,118	60,139	73,394	285,055
48	1,200	3,075	581	2,182	6,400
49	2,890	37,750	355	2,836	9,681
50	7,425	9,000	6,389	10,810	29,075
51	2,715	4,645	379	6,293	14,075

TABLE OF MAINE

Consecutive number.	Industry.	Number of establishments.	AVERAGE NUMBER OF WAGE-EARNERS.			Total.
			Men over 16 years.	Women over 16 years.	Children under 16 years.	
52	Iron work, architectural and ornamental	3	70	-	-	70
53	Kindling wood	4	48	-	12	65
54	Leather, tanned, curried, and finished	31	584	-	3	587
55	Lime and cement	20	582	-	-	582
56	Lock and gun smithing	21	7	-	-	7
57	Looking-glass and picture frames	18	62	10	-	72
58	Lumber and timber products	838	6,775	54	5	6,834
59	Lumber, planing mill products, including sash, doors, and blinds	70	738	1	3	742
60	Marble and stone work	78	2,246	-	-	2,246
61	Masonry, brick and stone	91	1,292	-	-	1,292
62	Mattresses and spring beds	8	21	5	-	26
63	Millinery, custom work	270	1	397	-	398
64	Mineral and soda waters	34	77	4	5	86
65	Models and patterns	5	6	-	-	6
66	Monuments and tombstones	102	303	-	-	303
67	Oil, not elsewhere specified	5	33	-	-	33
68	Oilcloth, floor	3	260	4	-	264
69	Painting, house, sign, etc.	247	672	-	1	673
70	Paper and wood pulp	35	4,560	291	-	4,851
71	Patent medicines and compounds	29	40	87	3	130
72	Paving and paving materials	8	151	-	-	151
73	Photography	98	47	34	-	81
74	Pickles, preserves, and sauces	3	4	15	-	19
75	Plastering and stuccowork	11	58	-	-	58
76	Plumbing, and gas and steam fitting	112	499	1	-	500
77	Pottery, terra-cotta, and fire-clay products	3	155	-	-	155
78	Printing and publishing, book and job	79	209	63	4	276
79	Printing and publishing, newspapers and periodicals	120	664	615	30	1,309
80	Roofing and roofing materials	9	167	-	-	167
81	Saddlery and harness	160	161	2	-	163
82	Ship and boat building, wooden	115	1,369	-	-	1,369
83	Shirts	6	41	242	-	283
84	Slaughtering and meat packing, wholesale	3	14	-	-	14
85	Slaughtering, wholesale, not including meat packing	8	23	1	-	24
86	Soap and candles	8	6	-	-	6
87	Sporting goods	3	2	-	-	2
88	Starch	45	111	-	-	111
89	Taxidermy	7	16	1	-	17
90	Tinsmithing, coppersmithing, and sheet-iron working	117	203	5	1	209
91	Tobacco, cigars and cigarettes	54	142	37	3	182
92	Tools, not elsewhere specified	5	47	-	-	47
93	Trunks and valises	10	194	24	-	218
94	Vinegar and cider	11	9	-	-	9
95	Watch, clock, and jewelry repairing	180	100	7	2	169
96	Wood, turned and carved	52	726	107	18	851
97	Woolen goods	76	4,230	1,941	109	6,280
98	Worsteds goods	3	364	420	91	875
99	All other industries	101	2,844	491	36	3,371
100	Totals	6,702	53,701	18,913	2,202	74,816

## MANUFACTURING INDUSTRIES.

Consecutive number.	Total wages.	Capital.	Miscellaneous expenses.	Cost of materials used.	Value of product.
52	\$32,789	\$171,488	\$1,789	\$156,285	\$210,800
53	21,373	53,072	2,617	23,579	62,976
54	229,268	1,376,106	102,332	1,943,204	2,451,713
55	248,371	1,942,007	97,878	646,239	1,226,972
56	3,146	20,475	2,380	5,395	22,960
57	39,788	73,295	6,256	79,447	158,340
58	2,633,771	15,764,538	514,059	7,994,596	13,489,401
59	351,793	1,351,555	69,839	767,908	1,414,504
60	1,090,915	2,759,910	97,237	172,409	1,838,040
61	729,772	491,123	37,786	765,117	1,933,508
62	10,206	19,323	1,143	19,334	53,776
63	106,495	437,134	60,747	598,561	1,007,535
64	35,075	216,497	14,004	167,490	285,187
65	2,915	5,775	715	4,818	12,920
66	170,548	450,845	110,756	228,670	669,993
67	10,088	95,585	1,704	17,290	41,500
68	146,700	146,954	7,515	302,050	567,000
69	328,460	293,783	30,310	261,611	836,957
70	2,162,972	17,473,160	1,394,967	7,118,945	13,223,275
71	40,764	455,752	113,069	124,629	390,367
72	60,550	78,284	1,769	11,828	107,954
73	29,554	148,134	20,786	69,042	210,243
74	4,310	12,200	513	39,691	54,450
75	32,654	12,905	1,334	15,395	60,070
76	274,272	624,171	35,351	729,256	1,288,882
77	70,225	168,382	36,779	57,716	222,260
78	122,247	363,434	30,258	133,485	415,370
79	473,026	1,668,820	480,690	514,384	2,190,017
80	72,735	363,176	11,043	51,488	155,432
81	72,518	275,285	18,349	214,859	426,868
82	749,567	1,315,820	65,463	1,377,769	2,491,765
83	80,350	101,054	10,585	122,982	247,650
84	7,220	34,800	5,717	134,338	156,236
85	10,680	97,880	1,102	322,693	397,506
86	2,519	21,883	732	12,342	21,460
87	650	6,675	305	1,505	5,916
88	34,824	344,349	9,176	358,716	555,576
89	11,329	19,680	4,113	7,336	43,891
90	110,292	315,419	26,884	187,124	474,877
91	86,161	134,076	37,053	98,643	284,817
92	22,600	78,600	4,391	40,190	80,600
93	98,548	324,923	31,628	188,622	441,402
94	2,475	16,933	888	6,348	15,014
95	49,933	159,298	30,619	62,755	261,755
96	290,367	693,544	32,420	332,898	853,298
97	2,383,323	12,642,658	659,319	6,842,679	11,633,232
98	305,363	1,486,635	190,380	1,102,307	1,779,552
99	1,384,626	5,984,511	271,894	2,662,719	5,426,521
100	\$28,527,849	\$122,918,826	\$7,774,216	\$68,863,408	\$127,361,485

The 99th item in the above table, which includes 101 establishments, is made up from 76 minor industries which have only 1 or 2 establishments each in the State. They are as follows:

Artificial limbs.....	1
Babbitt metal and solder.....	1
Belting and hose, leather.....	2
Bicycles and tricycles .....	1
Blacking .....	2
Boot and shoe findings.....	2
Brassware .....	1
Carpets, rag.....	1
Carriages and sleds, children's.....	1
Cars and general shop construction and repairs by street railroad companies.....	1
China decorating.....	2
Clocks .....	1
Coffee and spice, roasting and grinding.....	2
Cordage and twine.....	2
Cotton waste.....	1
Dyeing and finishing textiles.....	1
Dyestuffs and extracts.....	1
Electrical apparatus and supplies.....	2
Engraving and diesinking.....	1
Engraving, wood.....	1
Explosives .....	1
Fancy articles, not elsewhere specified.....	2
Felt goods.....	2
Firearms .....	1
Fireworks .....	1
Food preparations .....	2
Fur hats.....	1
Furnishing goods, men's.....	2
Furs, dressed.....	1
Gas machines and meters.....	1
Glass, cutting, staining, and ornamenting.....	1
Gloves and mittens.....	1
Glue .....	1
Grease and tallow.....	2
Hand knit goods.....	2
Hats and caps, not including fur hats, and wool hats..	1



Hones and whetstones.....	I
Iron and steel.....	I
Iron and steel, forgings.....	I
Kaolin and other earth grinding.....	I
Lasts .....	2
Leather goods.....	2
Lithographing and engraving.....	2
Matches .....	I
Musical instruments, organs and materials.....	I
Oakum .....	I
Optical goods.....	2
Paints .....	2
Perfumery and cosmetics.....	I
Photographic materials.....	I
Photolithographing and photoengraving.....	I
Pipes, tobacco.....	I
Plated and britannia ware.....	2
Plumbers' supplies .....	I
Pumps, not including steam pumps.....	2
Refrigerators .....	I
Sand and emery paper and cloth.....	I
Sausage .....	I
Saws .....	I
Shipbuilding, iron and steel.....	2
Shoddy .....	2
Show cases.....	I
Silk and silk goods.....	I
Stencils and brands.....	I
Stereotyping and electrotyping.....	I
Surgical appliances.....	I
Toys and games.....	I
Typewriter repairing.....	I
Umbrellas and canes.....	I
Upholstering materials.....	2
Varnish .....	I
Washing machines and clothes wringers.....	I
Window shades.....	2
Wirework, including wire rope and cable.....	I
Woodenware, not elsewhere specified.....	2
Wool pulling.....	I

## MAINE'S LUMBER, PULP AND PAPER INDUSTRIES.

Compiled from Reports of the Twelfth Census.

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VALUE OF THE PRODUCT.

From the Reports of the Twelfth Census of the United States, we are enabled to give in detail the various facts relating to the cutting of lumber, the rough sawmill product, and the manufacture of paper and wood pulp in the State of Maine, for the year 1900.

The cutting and manufacture of lumber has always been an important factor in the development of the State, in fact it has been one of its leading industries from the days of the early settlements until the present time, and bids fair so to continue for an indefinite period. Mr. Ring, in his report of 1902 as Forest Commissioner of Maine, estimates the present stand of merchantable spruce in the State, that is, nine inches in diameter breast high, at 21,239,000,000 board feet, and that the annual growth is sufficient to warrant the cutting of 637,000,000 feet each year without depleting the supply. No close estimate of the amount of standing timber of other varieties is available, but it is a fact worthy of note that of the cut of saw logs in 1900, amounting to 849,686,000 board feet, 425,148,000 were of spruce and 424,538,000, or practically one half, were of other varieties.

The value of the product of rough and planed lumber in the State, as given by the Census Reports by decades since 1850, is as follows:

1850 .....	\$5,872,573
1860 .....	6,598,565
1870 .....	11,395,747
1880 .....	7,933,868
1890 .....	11,849,654
1900 .....	13,489,401

From the above figures it will be seen that in the forty years from 1850 to 1890 the volume of this industry more than doubled and has largely increased since.

The amount for 1900 is made up of the value of merchant products and the amount received for custom work, but excludes the value of custom products, \$11,476,563; the value added by planing, \$1,704,702; and lumber not sawed, such as posts, ties, poles, hewed timber, bark, etc., \$308,136.

The value of the product of the five leading industries of the State for 1900 was as follows:

Cotton goods.....	\$14,631,086
Lumber and timber products.....	13,489,401
Paper and wood pulp.....	13,223,275
Boots and shoes.....	12,295,847
Woolen goods.....	11,633,232

No other industry shows a product of five million dollars. The combined products of cotton and woolen goods amount to \$26,264,318, while the combined products of the two industries, lumber and timber, and paper and wood pulp, amount to \$26,712,676, an excess over the textiles of \$448,358.

#### THE CUT OF 1900.

The timber cut of 1900 in the State for saw logs, given in board feet, was as follows:

Spruce .....	425,148,000
White pine.....	220,235,000
Hemlock .....	88,552,000
Other conifers.....	86,994,000
Hard woods.....	28,757,000
Total .....	849,686,000

The amount of lumber entering into the manufacture of pulp for the same year is given in cords. By applying the rule adopted by dealers in lumber, which is to reckon two cords of pulp wood equivalent to 1,000 feet of lumber, Bangor scale, the result would show in board feet:

Maine spruce .....	132,679,500
Canada spruce .....	10,294,000
Maine poplar .....	24,658,500
Canada poplar .....	269,500
Other woods .....	3,272,000
Total .....	<u>171,173,500</u>

Deducting the lumber cut in Canada, there would be left 160,610,000 feet of Maine lumber used as pulp wood, which, added to the total cut of saw logs, would give 1,010,296,000 feet as the aggregate cut of all kinds of lumber in the State for the year, 557,827,500 being of spruce and 452,468,500 of all other woods.

#### LUMBER MANUFACTURED IN 1900.

In 1900 there were 838 establishments in the State engaged in the manufacture of lumber, giving employment to 6,834 hands for a part of the year, including fifty-four women and five children under sixteen years old. The various products of these mills were as follows:

#### *Rough Sawmill Product in Board Feet.*

White pine .....	214,196,000
Value .....	\$2,516,222.00
Value per thousand .....	\$11.75
Hemlock .....	85,400,000
Value .....	\$925,029.00
Value per thousand .....	\$10.83
Spruce .....	409,533,000
Value .....	\$4,933,535.00
Value per thousand .....	\$12.05
Cedar .....	7,354,000
Value .....	\$57,815.00
Value per thousand .....	\$7.86
Norway pine .....	2,400,000
Value .....	\$22,800.00
Value per thousand .....	\$9.50
Tamarack .....	2,500,000
Value .....	\$50,000.00
Value per thousand .....	\$20.00

All other conifers.....	6,402,000
Value .....	\$67,231.00
Value per thousand .....	\$10.50
Total conifers .....	727,785,000
Value .....	\$8,572,632.00
Value per thousand .....	\$11.78
Ash .....	1,259,000
Value .....	\$16,019.00
Value per thousand .....	\$12.72
Birch .....	14,061,000
Value .....	\$164,748.00
Value per thousand .....	\$11.72
Elm .....	68,000
Value .....	\$683.00
Value per thousand .....	\$10.04
Hickory .....	100,000
Value .....	\$1,800.00
Value per thousand .....	\$18.00
Basswood .....	901,000
Value .....	\$9,994.00
Value per thousand .....	\$11.09
Oak .....	7,608,000
Value .....	\$107,148.00
Value per thousand .....	\$14.08
Poplar .....	578,000
Value .....	\$5,875.00
Value per thousand .....	\$10.16
Maple .....	3,427,000
Value .....	\$39,314.00
Value per thousand .....	\$11.47
Other hard woods .....	728,000
Value .....	\$8,524.00
Value per thousand .....	\$11.71
Total hard woods .....	28,730,000
Value .....	\$354,105.00
Value per thousand .....	\$12.33
Aggregate conifers and hard woods .....	756,515,000
Value .....	\$8,926,737.00
Value per thousand .....	\$11.80

*Shingles.*

White pine .....	30,196,000
Value .....	\$55,052.00
Value per thousand .....	\$1.82
Cedar .....	332,816,000
Value .....	\$666,414.00
Value per thousand .....	\$2.00
Hemlock .....	15,561,000
Value .....	\$21,026.00
Value per thousand .....	\$1.35
Spruce .....	78,078,000
Value .....	\$148,134.00
Value per thousand .....	\$1.90
Other conifers .....	8,876,000
Value .....	\$12,684.00
Value per thousand .....	\$1.43
All hard woods .....	135,000
Value .....	\$189.00
Value per thousand .....	\$1.40
Total .....	465,862,000
Value .....	\$903,499.00
Value per thousand .....	\$1.94

*Cooperage.*

Hoops, number .....	670,000
Value .....	\$2,945.00
Value per 1,000.....	\$4.40
Staves, number .....	70,489,000
Value .....	\$293,171.00
Value per 1,000.....	\$4.16
Sets of headings .....	3,911,950
Value .....	\$115,212.00
Value per 1,000 sets.....	\$29.45

*Other Sawed Products.*

Bobbin and spool stock, board feet .....	26,254,000
Value .....	\$294,705.00
Value per thousand .....	\$11.23

Furniture stock, board feet .....	605,000
Value .....	\$9,580.00
Value per thousand .....	\$15.83
Agricultural implement stock, board feet ....	20,000
Value .....	\$280.00
Value per thousand .....	\$14.00
Carriage and wagon stock, board feet.....	584,000
Value .....	\$17,520.00
Value per thousand .....	\$30.00
Pickets and palings, board feet .....	669,000
Value .....	\$7,336.00
Value per thousand .....	\$10.97
Laths, number .....	217,376,000
Value .....	\$364,654.00
Value per 1,000.....	\$1.68
Other sawed products, value .....	\$1,179,009.00
Total value .....	\$1,873,084.00
Received for custom work .....	\$285,568.00

## PAPER AND WOOD PULP PRODUCT.

*Statistics for 1900.*

Number of establishments in Maine.....	35
Individual .....	1
Firm and limited partnership .....	4
Incorporated company .....	30
Total capital .....	\$17,473,160
Land .....	\$2,671,385
Buildings .....	\$3,866,120
Machinery, tools, and implements .....	\$6,148,974
Cash and sundries .....	\$4,786,681
Proprietors and firm members.....	12
Salaried officials, clerks, etc. ....	258
Total salaries .....	\$445,348
Officers of corporations .....	40
Salaries .....	\$115,281
General superintendents, managers, clerks, etc .....	218

Salaries .....	\$330,067
Men .....	204
Salaries .....	\$323,777
Women .....	14
Salaries .....	\$6,290
Wage-earners, including piece-workers, average	4,851
Wages .....	\$2,162,972
Men, 16 years and over.....	4,560
Wages .....	\$2,082,923
Women, 16 years and over.....	291
Wages .....	\$80,049
Total miscellaneous expenses .....	\$1,394,967
Rent of works.....	\$199,251
Taxes, not including internal revenue...	\$122,071
Rent of offices, insurance, interest, and all sundry expenses not hitherto included.	\$1,067,754
Contract work .....	\$5,891
Total cost of material .....	\$7,118,945
Domestic spruce for ground wood, cords	110,813
Cost .....	\$577,183
Domestic spruce for sulphite and soda fiber, cords .....	154,546
Cost .....	\$747,982
Canadian spruce for ground wood, cords	16,338
Cost .....	\$136,064
Canadian spruce for sulphite and soda fiber, cords .....	4,250
Cost .....	\$34,012
Domestic poplar for soda fiber, cords....	49,317
Cost .....	\$199,377
Canadian poplar for soda fiber, cords....	539
Cost .....	\$1,716
Other pulp wood for ground wood, cords	6,544
Cost .....	\$21,757
Rags, including cotton and flax waste and sweepings, tons.....	7,894
Cost .....	\$241,359
Old or waste paper, tons.....	1,010
Cost .....	\$16,489



Manila stock, including jute bagging, rope, waste, threads, etc., tons.....	1,005
Cost .....	\$16,797
Ground wood pulp purchased, tons.....	48,740
Cost .....	\$599,129
Soda wood fiber purchased, tons.....	8,718
Cost .....	\$369,079
Sulphite wood fiber purchased, tons.....	36,541
Cost .....	\$1,061,125
Chemicals .....	\$688,488
Clay .....	\$163,803
Colors .....	\$30,057
Sizing .....	\$91,146
All other stock.....	\$76,716
Fuel .....	\$658,679
Rent of power and heat.....	\$74,922
Mill supplies .....	\$391,399
All other materials.....	\$540,526
Freight .....	\$381,140
Total value of product .....	\$13,223,275
News paper in rolls, tons.....	112,995
Value .....	\$3,756,600
News paper in sheets, tons .....	9,743
Value .....	\$365,450
Book paper, tons .....	30,041
Value .....	\$2,660,211
Heavy wrapping paper, tons.....	953
Value .....	\$27,830
Bogus or wood manila paper, tons.....	31,849
Value .....	\$1,608,605
All other wrapping paper, tons.....	6,857
Value .....	\$455,863
Leather boards, tons .....	1,540
Value .....	\$138,322
Wood pulp boards, tons .....	11,802
Value .....	\$336,335
News boards, tons .....	1,351
Value .....	\$40,530
All other boards, tons .....	150

Value .....	\$4,900
Ground wood pulp made for own use, tons .....	50,924
Ground wood pulp made to sell as such, tons .....	78,954
Value .....	\$1,168,887
Soda fiber made for own use, tons .....	11,206
Soda fiber made to sell as such, tons....	32,956
Value .....	\$1,269,141
Sulphite fiber made for own use, tons...	30,436
Sulphite fiber made to sell as such, tons..	27,143
Value .....	\$1,390,601
Fourdrinier paper machines .....	56
Total width in inches .....	5,100
Cylinder paper machines .....	22
Total width in inches .....	1,554
Wet machines .....	160
Beating engines .....	225
Capacity, pounds .....	217,750
Washing engines .....	32
Capacity, pounds .....	17,200
Jordan or refining engines .....	80
Digesters for mills making their own soda or sulphite .....	83
Total capacity, tons .....	416
Boilers used for digesters .....	45
Horsepower .....	7,325
Cooks per week .....	914
Grinders for mills making ground wood pulp...	178
Yearly capacity of mills in paper, tons.....	246,583
Yearly capacity of mills in pulp, tons .....	330,649
Power, total horsepower .....	92,720
Steam engines owned .....	135
Horsepower .....	15,620
Gas or gasoline engines owned .....	7
Horsepower .....	846
Water wheels owned .....	402
Horsepower .....	75,839
Electric motors owned .....	10
Horsepower .....	390



duced at Stockbridge, Massachusetts, in 1867, the product being used in a paper mill at Lee. A small proportion of this material was mixed with more conservative grades of stock, and the result, though far from satisfactory at first, grew better as experience taught how the new material should be used. The use of rags for making news papers has been entirely superseded by wood.

The earliest mills in this country were established before the invention of the Fourdrinier machine, and the process of making paper was therefore conducted by hand. The rag fiber, after being prepared in the beating machine, was formed into a sheet in a mold or wire sieve, which was dipped from the pulp vat by hand, the water drained off, and the pulp left in a wet sheet in the mold. Sheets so made were turned out upon a felt, pressed, and then dried by exposure to the air in single sheets. Such mills were small, employing few hands, and of limited product. Paper was made by hand at Roxboro, in the vicinity of Philadelphia, as early as 1690, by William Rittenhouse. In 1729 the Ivy Mills on Chester Creek, in Delaware county, Pennsylvania, were built by Thomas Wilcox, and up to 1866 produced handmade paper. Here was made the paper which supplied the press of Benjamin Franklin, and during the Revolution, the paper for the Continental currency. To a limited extent paper is still made by hand.

By the Fourdrinier machine the transformation of the fluid stock to finished paper is made an automatic operation. The pulp is screened from the vat over an apron to a moving endless wire cloth made of closely woven fine brass wire, and supported by a series of small metal rolls, set close together but without touching each other. In this way an even surface of the wire cloth is maintained, and by preserving an unvarying flow of the pulp and a constant forward motion of the wire cloth the thickness of the layer of pulp deposited is kept uniform. By a violent lateral motion or "shake" of the supporting rolls the fibers are caused to interlace in various directions and give greater transverse strength to the texture. As the pulp is carried along on the wire cloth much of the water drains through, leaving the fiber on the meshes. This first drying is usually hastened by various devices. After sufficient water has drained from

the pulp the moist web is carried between couch rolls which are covered with woolen felt, and there taken from the wire cloth on endless woolen felts, which pass it between press rolls, and thence to driers. These are large metal cylinders heated by steam, placed one after another or in two tiers; their number varies in different machines. By the time it has passed the press rolls the paper has acquired considerable strength from the loss of the greater part of its moisture. The heated cylinders complete the drying process, and then the paper is given a smooth surface by the calenders, which are smooth-faced heavy metal rollers arranged vertically in a stack, giving great pressure by their cumulative weight. Finally the finished paper is reeled off in rolls or cut into sheets of the desired size. The widest paper machine in the world is running in the mills at Rumford Falls, Maine.

Another type of paper machine, known as the cylinder machine, differs from the Fourdrinier mainly in that the pulp, instead of being flowed onto a moving endless wire cloth, is taken up by a cylinder, the face of which is formed from close-meshed wire cloth, revolving partly submerged in the vat of stock. From the cylinder the net is removed by a couch roll carrying a felt, and then dried and finished essentially as in the Fourdrinier machine. There is less waste of pulp in this machine, but the paper made by it has less transverse strength, because the fibers lie mostly in the line of travel of the web, there being no "shake" to give them lateral motion.

There is no more striking comparison between the old and the new in the paper industry than to note the points of difference between the earlier mills with limited product, and employing little labor outside the proprietor and his family, and some of the best modern mills. The new plant of the Great Northern Paper Company, at Millinocket, Maine, is probably the largest in point of tonnage in the world, and with its houses for employes, shops, and other dependent features, forms a city in itself. It makes 250 tons of finished paper each twenty-four hours. In another plant in the same State a single machine is producing 50 tons of wrapping manila in twenty-four hours, with a daily average of nearly four-fifths of this amount. A machine in the mills at Winslow, Maine, which is reputed to have the largest tonnage of any paper machine in the world,

turns out a continuous web of finished paper at the rate of 500 feet a minute. The mill in which this machine is run is one of the largest and most modern wrapping-paper mills in existence, having a capacity of about 100 tons a day.

From the hand process of the early days to such huge machines as are now in use is a progress in method of production which explains the immense increase in the volume of the products of this industry. The principles are the same whether the pulp is taken from the vat on small hand sieves and turned out a single sheet at a time, or whether it is flowed onto an endless wire cloth from which it is conveyed on blankets or felts in a continuous web through heavy press rolls and then over steam-heated drying cylinders. By the introduction of such machinery not only has the rapidity of manufacture been multiplied many times and the labor cost diminished, but the quality of the product has become more uniform and capable of more exact regulation.

During the nineteenth century there was a remarkable improvement in the method of making paper from the stock, while the materials from which the stock is made were revolutionized in the last half of the century. Although various attempts had previously been made to provide a cheaper substitute for paper rags, and many other materials are used to some extent, yet the cheapness of wood pulp and the abundance of wood from which it can be made have brought about changes that appear almost marvelous.

The raw material of wood pulp is spruce, poplar, and, in smaller quantities, various other woods, according to the location of plant, the process employed, and the kind of paper in which the material is to be used. To a very great extent this material has superseded the use of rags, entirely so in the manufacture of news papers, very largely so in the manufacture of book and wrapping papers, and to a considerable proportion in writing and other grades. Treated mechanically or chemically, it furnishes all the essential qualities in nearly every grade of paper. The history of the discovery that wood could be made into paper, and the gradual adoption of this material, would be too extensive for the purpose of this report.

Many varieties of woods are suitable for ground wood pulp, but spruce is the principal raw material. In preparing the pulp

the wood is cut into suitable lengths for grinding, the bark removed, and the blocks held by hydraulic pressure against the edge of a rapidly revolving grindstone and by attrition reduced to a mushy consistency.

The fiber as thus ground is screened and either used in a liquid state for the paper machines in the same establishment or run over "wet machines" into thick sheets which are folded into bundles and shipped to points where they are to be used. The pulp so made is the basis of all lower grades of paper. As already noted, the pulp industry has become an integral part of the paper business, over half of the ground wood produced being made into paper on the spot.

Since the introduction into this country, in 1866 or 1867, of the German process for making a ground wood fiber, its use has steadily increased until it has nearly driven other materials from the field, except for higher or special grades of paper. When the manufacture of wood pulp first appeared as an industry in the census of 1870, 8 establishments were reported, with products valued at \$172,350. In 1880 there were 50 establishments, with products valued at \$2,256,946. In 1890, 82 establishments reported products valued at \$4,627,796. The first wood pulp made in this country was sold at 8 cents per pound; today the price is less than 1 cent. Doubtless the general adoption of the new material was aided by the great scarcity of rags and the high range of prices prevailing in the sixties. Rags were worth from 4 to 6 cents a pound, and news paper was selling at 14 and 15 cents and book paper from 27 to 35 cents, double or triple the prices prevailing just before the war. The cheapness of the wood fibers commended them for all purposes where they could be used, and stimulated the efforts to adapt them to more extended uses. The profusion of the wood supply in the great forests of spruce and other woods in the United States renders this a cheap material, and competition and improvements in process have reduced the cost still further in recent years.

Sulphite fiber, next in importance as a product in the pulp industry, is made by a chemical method of producing fiber instead of a mechanical, as in the case of ground wood. For both processes, however, spruce is the most common material, though many other woods are used. The wood after being

barked is cut into small chips, which are dissolved by boiling or cooking with sulphurous acid in large boiling tanks or digesters. The product, after being washed and otherwise prepared for use, has a much longer fiber than a mechanically prepared pulp, and is used to give strength to papers in which that quality is required. News, common wrapping papers, and some other grades consist chiefly of ground wood with 10 to 25 per cent of this chemically prepared sulphite added to hold them together. Other grades, e. g., strong wrapping papers, are made entirely from sulphite fiber.

This process is of American invention and was first used in 1867. Its early development was slow, owing to the difficulty of procuring the necessary apparatus. The strong chemicals employed penetrated the linings of the digesters as then constructed, eating into their shells and rapidly spoiling them for use, and until recently no species of lining had been found to resist the attacks of the acid and keep the digesters whole. Within a few years, however, linings have been invented which secure this end and the sulphite process is now established as the leading method of production of chemical pulp.

Soda fiber is ordinarily made from woods softer than spruce, chiefly poplar, and is a softer, mellower fiber, without much strength. It is used as a soft stock in book, and to some extent in writing papers. Its preparation is similar to that of sulphite, except that in place of sulphurous acid a solution of caustic soda is used in the digesters. The process is older than either of the two just mentioned, having been introduced into this country from England in 1854. It came into extended use earlier than the sulphite fiber, but owing to the greater cheapness of the sulphite process in producing a strong cellulose fiber from spruce, the use of the latter has increased more rapidly than that of soda.

The merchantable shape of these fibers differs somewhat. Ground wood is ordinarily sold in folded sheets only partially dry, and is, therefore, under common conditions only suitable for use near the locality of its manufacture, its weight being so increased by the water as to preclude the profitable transportation of such a low-priced product, on account of the freight on this extra weight. Sulphite is either sold in similar shape,



first having had a portion of the water removed by pressure, or else dried by steam in rolls like paper; soda fiber is ordinarily so sold, though sometimes in a partially wet state like sulphite.

Since 1867 the ground wood manufacture has developed until in 1900 there were 91 plants producing 280,052 tons for sale, and 77 mills making 306,322 tons for their own use. Soda fiber was first made in the United States experimentally in 1854 or 1855; the first soda-fiber plant began operations in 1862 or 1863, and the earliest one still in existence, in 1869. In 1900, 20 establishments were manufacturing for sale 99,014 tons, and 16 establishments were producing for their own use 78,110 tons. The first sulphite plant was started shortly after the Civil war, though a general use of the fiber began some years later, about 1884. In 1900, 40 mills produced 271,585 tons to sell, and 29 establishments made 144,452 tons for their own use.

The manufacture of ground wood pulp, as well as the use of the large Fourdrinier and cylinder machines, would be impossible without the modern transformers of energy. The grinding of wood is usually accomplished by water wheels commonly fitted directly with the stones by which the wood is converted into pulp. From 75 to 100 horsepower per ton of wood pulp is required each twenty-four hours for these grinders and the necessary auxiliary machinery. For the paper machines steam is the most satisfactory power on account of the constant and easily governed speed of the steam engine, whereby uniformity in the thickness of the paper can be secured. Water power, on the other hand, is sure to vary in volume and pressure, and cannot be quickly enough controlled to make the flow of pulp so uniform. Furthermore, in using steam engines for the machines, the exhaust is utilized in the cylinders which dry the paper, and waste is thus prevented. Although many machines were formerly run by water, this agency is rapidly being supplanted by steam. In the preparation or beating of stock and all general work about the mill, however, water power is more economical than any other unless steam is produced by natural gas.

Within the last decade electric power is being more and more used in this, as in other industries and it seems destined to play a still larger part. The most extensive and complete system now in use is installed in the Millinocket plant of the Great Northern

Paper Company, in Maine, where the three generators are each driven by a pair of turbine water wheels, furnishing in all about 4,500 horsepower; they drive all the machinery of the mill except the Fourdrinier machines, which are run by steam engines, and the pulp grinders, which are directly connected to turbines.

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REPORT

OF THE

INSPECTOR OF FACTORIES, WORKSHOPS,  
MINES AND QUARRIES.

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STATE OF MAINE.

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OFFICE OF INSPECTOR OF FACTORIES,  
WORKSHOPS, MINES AND QUARRIES,  
BIDDEFORD, DECEMBER 1, 1903.

*To Hon. Samuel W. Matthews, Commissioner of Industrial and  
Labor Statistics:*

In compliance with the requirements of an act of the legislature, approved March 29, 1893, directing the Inspector of Factories, Workshops, Mines and Quarries to make a report to the Commissioner of Industrial and Labor Statistics on or before December first annually, I have the honor to herewith submit my seventh annual report.

Very respectfully,

CHARLES E. ATWOOD,

*Inspector.*



# REPORT.

## WHAT HAVE WE ACCOMPLISHED.

The attempt made recently to secure the abolishment of the office of Inspector of Factories, Workshops, Mines and Quarries in this State, and thereby largely to neutralize any possible beneficial results from the enforcement of our State labor laws, prompts the inquiry: What has been gained by factory and workshop inspection; what progress if any, has been made during the sixteen years since the enactment of the law creating that office?

The authority of factory inspector in this State is limited, and his duties, which remain today as originally prescribed, are few, covering but a fraction of the field calling loudly for inspection. To be exact, he is required by law to do just four things, namely:

First, he must enforce a law requiring the doors in factories and workshops to swing outward.

Second, he must notify local boards of health of unsanitary conditions which may exist in factories and workshops.

Third, he must enforce a law which requires all firms and corporations employing ten persons or more to pay wages fortnightly.

Fourth, he must inquire into the employment of children and women in factories and workshops and enforce the provisions of chapter 139 of the public laws of 1887, which provides that no child under twelve years of age shall be employed in any manufacturing or mechanical establishment, nor any child under fifteen years of age except during vacation of the public schools, unless such child has attended school sixteen weeks of each year preceding its sixteenth year, that to secure such em-

ployment, every child must present a certificate from the school authorities to the effect that the school laws are complied with, and that it shall contain the age and birthplace of such child, and be kept on file for reference by the employer; that no female minor under eighteen years of age, and no male minor under sixteen years of age, and no woman shall work more than ten hours a day or sixty hours a week; that male minors over sixteen years of age, with consent of parents, may contract to work longer hours, ten hours being otherwise a legal day's work for such minors, the same rule applying to women over eighteen years of age, with the provision that the limit of overtime shall not exceed six hours in any one week or sixty hours in any one year; that employers must post in every room where minors and women are employed, a notice in large type regulating the hours of labor for such persons.

Down to 1887, when our present system of labor laws was enacted, Maine had grown to quite extensive proportions as a manufacturing state. Labor system it had none, each manufacturer making his own rules relating to help, wages and working hours, with the result that women and children of all ages and conditions were often huddled into unsanitary workrooms, and days of all lengths, from ten hours to fifteen hours, were demanded of them the year through.

Maine was not alone in allowing these loose, demoralizing labor methods, if methods they could be called. In many other states like conditions were more or less in vogue. A spirit of unrest was moving the masses and a ten hour day with restrictions as to child and woman labor came as the logical result, our State being among the latest in New England in its adoption. These results came not without bitter opposition on the one hand, and persistent, unyielding effort on the other. It goes without saying that no such moral revolution as this proved to be could then or now be long maintained without organized effort and constant watchfulness, backed by proper statute law.

Starting out with the premises indicated, crude laws, and inexperienced inspectors with little authority to act, what have we gained?

In 1887, when our labor law system was inaugurated, the inspector found no fortnightly payment of wages. Most of the



larger corporations paid monthly, and the smaller ones paid at any time when most convenient, thus leaving the working masses between two fires, suspense and mental worry on the one hand, and the tender mercies of the landlord, the butcher and baker on the other. While most of the larger manufactories adopted the new rule without delay, it required a long period of persistent effort by the inspector before the smaller ones came into line, so that today but few complaints are heard, and these are against the very smallest concerns employing ten or more operatives. With so very few delinquents in a total of more than six thousand manufacturing establishments in Maine, the result as to fortnightly payments is one to be proud of.

In 1887, the sanitary conditions in many manufacturing establishments were defective, and in not a few such conditions were almost unbearably bad. Poor drainage, lack of sewerage and little ventilation, either in workshop or living tenement, were not infrequently found. The change in sanitary conditions, both as to mills and workshops, and the dwellings of the workers, has been marked and gratifying. As a rule the mills and workshops of Maine are today among the best kept buildings in the village or city where located, neat and attractive within and without.

In Maine factories and workshops, almost without exception, inner doors, and outer doors as well, swing outward, thus greatly reducing danger in case of fire.

To say that all these uniform improvements simply "happened" would be a sorry begging of the question. Nine times in ten they are directly due to the constant care, the suggestive and sometimes imperative word of the watchful inspector, who is on duty twelve months in the year. To dispense with the services of this officer would be a long step backward in the march of solid improvement already made in the field of industrial labor in this, our Dirigo commonwealth. I do not say this from personal interest, nor from any interest other than what every true citizen of Maine should feel, but from a thorough knowledge of the whole situation and a careful study of its needs.

The question of child labor leads all the rest. Fourteen states have enacted child labor laws, but in not one of them has the climax of success yet been reached. At the annual meetings of

the International Association of Factory Inspectors the question of child labor has been the burning issue yearly. The wisest labor men agree as to the proper age limit for children, but the point in which most state labor laws fail is the method of ascertaining the child's age in every case. It is here that the law is evaded and rendered of little effect by self-interested mill owners and crafty parents, more largely by the latter.

Please notice that the marked changes for the better in the departments already named have been brought about solely by agreement between the only two parties thereto, the manufacturer and the inspector; but in the question of child labor there appears a third factor, the parent. As I study this problem in the light of experience, I am more than ever convinced that this whole vexed question could be settled easily and settled right if it could be left to the factory owner and inspector, minus the parent.

On its face our State law as to obtaining the age of the child laborer seems a fairly good one, and it is if parents and mill owners will be honest. Our law requires the mill overseer to keep on file a certificate of the child's age, place of birth and school attendance, to be signed by a member of the school committee, or whoever he may authorize to sign. Owing to the disposition of greedy parents to falsify these certificates they may and often do become of very little value. The certificate that would carry weight, and the only one fit to bank upon in these cases would be a certified copy of the official record of the child's birth and place of residence. Until our law requires such a record the inspector has no definite data to rely upon in the prevention of the employment of illegal child labor.

And yet, in face of these difficulties, the number of children in our Maine factories has been less in 1903 than at any other time in recent years. Of the more than 75,000 wage earners in our State only 585 children under sixteen have been constantly employed during the year, which is a very small labor contingent. With the much needed law calling for certified copies of the official record of births, the number of child workers would be reduced to the true minimum.

But the child labor question in Maine is quite insignificant when compared with the child non-labor or truant question. In

this State there are 200,000 children between the ages of five and twenty-one years, slightly more of boys than girls. Of these 200,000 children, 70,000 did not attend school at all last year, and this in the face of the most strenuous compulsory school law that could well be framed. Here are some of its provisions:

1. Every person having under his control a child between the seventh and fifteenth anniversaries of his birth forfeits twenty-five dollars if he fails to have said child attend school during the time the public schools are in session.

2. Cities and towns forfeit ten to fifty dollars if they do not annually elect truant officers, and said truant officers neglecting to arrest and prosecute truants, when directed so to do by superintending school committees, forfeit a like amount.

3. Every boy between the ages of seven and fifteen years, who refuses to attend school, and who may be found wandering about the streets or public places of any city or town during school hours of the school day, while the school of which he is legally a scholar is in session, on complaint of a truant officer, shall be committed to the State School for Boys.

Think a moment. With a general state superintendent of schools, fifteen hundred local superintending school committee-men and five hundred truant officers, two thousand sworn officers in all, behind an up-to-date compulsory school law, to which may be added a contingent of sixty-five hundred school teachers, who are or should be personally interested in its success, surely we have in this State an educational force of ample proportions and power to make Maine a model of intelligence and good morals. But the lamentable truth is that our compulsory school law is so slackly enforced that today it is practically a dead letter upon the statute book. In evidence we have the sad fact that today there are 70,000 Maine children out of school. In further evidence we have the still sadder fact that our petty criminals are today made up largely of boys who are allowed to loaf around street corners and back alleys during school time. A study of the municipal court records of the State will abundantly confirm this. Is there no remedy for this demoralizing tendency of things?

## TWO SUGGESTIONS.

While I am not ambitious for a more complicated line of official duties than I now have, I may be allowed to make a suggestion, which certainly would not hinder, but would, as I believe, materially help in bringing in a better condition of things. First, make the compulsory school law and the labor law identical as to the age limit. Then turn the enforcement of the school law over to the inspector of factories, with a corps of assistants, with authority to send idle boys to the common school, to the workshop or to the State School for Boys. This would be practical and businesslike.

Or, what might be more effective, appoint a state truant officer to have immediate control of all local truant officers, with all the power necessary to reduce the non-school-going surplus to proper proportions.

The crying need of the hour is that it shall be made so unhealthy in the streets of our cities and villages, by somebody, for idle boys from twelve to sixteen years of age, that they will henceforth be found in the school room or work room every day in the week during school hours. It is a simple proposition, entirely practical, and if promptly accepted could not fail to accomplish beneficial results. These suggestions call, of course, for a radical amendment of our compulsory school law. As it stands its teeth lose their edge, for the reason that it now seems to be the special business of nobody in particular to enforce it. Amend the law, and make it the special duty of somebody in particular to enforce it, and, as I fully believe, the child labor problem, as well as the child truant problem, would be most satisfactorily solved.

## CHILDREN EMPLOYED.

The following schedule shows the number of children employed in cotton and woolen mills in 1903, compared with the number employed in 1902. A marked decrease will be noted.

It must be remembered that the number of children employed in factories varies considerably according to the seasons of year, as during school vacation time, especially the long summer vacation, the number of children at work is very much larger than

at other times, so that an average for the year would not fairly show the number employed regularly. The accompanying table shows very nearly the number of children steadily employed, without taking into account the ups and downs caused by temporary help, which may be employed at different times and only for a few weeks or months in a year, altogether.

Name of Corporation.	Location.	CHILDREN EMPLOYED.					
		1902.			1903.		
		Under 16 years.	Between 15 and 16 years.	Under 15 years.	Under 16 years.	Between 15 and 16 years.	Under 15 years.
Androsoggin Mills .....	Lewiston . . .	24	17	7	27	22	5
Bates Manufacturing Company .....	Lewiston .....	21	12	9	24	20	4
Continental Mills .....	Lewiston .....	17	12	5	17	13	4
Hill Manufacturing Company .....	Lewiston .....	20	18	2	16	12	4
Barker Mills .....	Auburn .....	5	5	-	6	6	-
Cabot Manufacturing Company .....	Brunswick .....	86	68	18	67	51	16
Lockwood Company .....	Waterville .....	83	44	39	78	45	33
Edwards Manufacturing Company .....	Augusta .....	23	14	9	22	17	5
Farwell Mills .....	Lisbon .....	31	21	10	30	22	8
Pepperell Manf. Co., Laconia Division ..	Biddeford .....	77	56	21	70	54	16
Pepperell Manf. Co., Pepperell Division ..	Biddeford .....	71	57	14	69	51	18
York Manufacturing Company .....	Saco .....	43	32	11	42	27	15
Goodall Worsted Company .....	Sanford .....	83	62	21	40	34	6
Sanford Mills .....	Sanford .....	86	37	49	47	36	11
Maine Alpaca Company .....	Springvale .....	42	26	16	30	18	12
Worumbo Manufacturing Company .....	Lisbon Falls .....	7	4	3	-	-	-
Totals .....		719	485	234	585	428	157

## INTERNATIONAL MEETING OF FACTORY INSPECTORS.

The proceedings of the seventeenth annual convention of the International Association of Factory Inspectors, held in Montreal, August 25, 26 and 27, 1903, were of much interest, as showing both how important a place the factory inspector occupies in the industrial world the country over, and what practical, up-to-date methods are being used for the betterment of the wage-earner, especially of the children. It was one of the largest in attendance that the organization has ever known. Fourteen states were represented by forty-two delegates and twenty invited guests.

In response to the call of Mr. James Mitchell, president of the association, for reports, among them the following were given.

Delegate Davis of Illinois claimed that his state had passed the most stringent child labor law in existence. It limited the hours during which children under sixteen could work to eight a day, and set the age limit at fourteen. It abolished the affidavit system, and placed the matter of authorizing children to go to work in the hands of the school authorities. Now it was incumbent on the child who wanted to go to work to go to the school it had last attended and get its certificate. That was taken to the superintendent of the school. If the child couldn't get a school certificate to prove its age it would have to get its baptismal record, or else prove it through the courts. There were eighteen inspectors. They visited the factories. They would accept the old affidavits made before notaries if the child seemed of age. Where they were palpably under fourteen they would insist on the school certificates. They had also passed a law increasing the salaries of everyone in the factory inspection department of the State, from the highest to the lowest. They had also been given authority to add eight inspectors to the staff, and had divided the State into districts.

Delegate Williams for New York reported quite a few changes in the child labor laws of the State. The hours of labor had been cut down from ten to nine, the laws had been amended so that certificates were to be issued by the local boards of health, and the health officer was required to test the child's education. Not only had the parent to submit clear proof as to the age of the child, but he must also file a definite statement from the school principal.

Delegate Hartzell reported for Pennsylvania that while the child labor law had not been changed, Captain Delaney had by his executive orders made it harder to violate them. Safeguards had been thrown about the ascertaining of the actual age of a child, and its signature was now required. Another change in the affidavit certificate was the requiring not alone of the name and address of the parent, but the office and home address of the one before whom it was made. While the Pennsylvania department had no specialty or hobby and would perform all its duties equally conscientiously, very particular attention would be paid to the enforcement of the child labor law.

North Carolina has passed a child labor law, which provides that no child under twelve years shall be employed in any fac-

tory or manufacturing establishment in the State; that a week's work in all factories and manufacturing establishments shall not exceed sixty-six hours; that mill owners violating the law shall be guilty of a misdemeanor, punishable by a fine not exceeding one hundred dollars, and that all parents or those standing *in loco parentis*, misstating a child's age, shall be found guilty of misdemeanor.

Oregon has prescribed fourteen as the minimum age, with the added prescribed condition that the children must not be illiterate.

Texas has a bill pending prohibiting child labor.

A stringent child labor law has passed the Kansas Senate. It forbids the employment of children under fourteen years of age at any steady labor, and provides that no person under sixteen years of age may work at night. The bill will necessitate the employment of men as messengers by the telegraph companies.

In Georgia, although the child labor bill was defeated, a vagrancy law has been passed that will effect some of the objects desired. In defining what constitutes a vagrant an amendment was adopted classing as such "any person who is able to work, but does not do so, and lives off the earnings of his minor children." Under the operation of this law all the lazy vagabonds in the mill districts who now do no labor harder than carrying food to their children in the mills, and drawing their wages on Saturday night, will be forced to work or go to jail.

Delegate Nordmeyer told of the enforcement of the child labor laws in Missouri. It was not possible now, he said, to find more than thirty children employed in the factories of St. Louis, where parents were not allowed to hire them out except in cases of extreme poverty. He said that hundreds of tots had been employed as delivery and messenger boys because they could travel on the street cars at half rates, but such labor had been abolished.

Delegate Hudson stated that Rhode Island had passed a new truant law. Heretofore all children under fifteen years of age had been required to attend school at least eighty days in the year. Now the age limit was twelve. All children under thirteen had to show a certificate to their employers to prove that they had had eight years of instruction.

Delegate Putnam of Massachusetts, in giving the latest labor laws of that State, told of the one making eight hours a legal day's labor. Another made it compulsory for manufacturers to provide clean and wholesome drinking water for their operatives during working hours; penalty, one hundred dollars fine; another gave a legal holiday of two hours after the opening of the polls on election day to enable operatives to vote. The most important law, he said, was that regarding the operation of freight and passenger elevators. According to its provisions no person under eighteen years of age is allowed to run an elevator. Mr. Putnam also explained the laws by which the inspectors had authority to require all street car companies to heat the cars where the outside temperature was as low as fifty degrees.

#### REGULATION OF CHILD LABOR.

The burning question uppermost in the industrial centers throughout the country, as the foregoing reports indicate, is that of child labor and how best to regulate it. Our Maine laws, both school and labor enactments, while no doubt meant to be effective, are so out of harmony with each other that each in a sense neutralizes the other. Our labor law provides that "no child under fifteen years of age shall be employed in any manufacturing or mechanical establishment in this State, except during vacations of the public schools in the city or town in which he resides, unless during the year next preceding the time of such employment, he has for at least sixteen weeks, attended some public or private school."

The school truant law provides that "every child between the seventh and fifteenth anniversaries of his birth shall attend some public day school during the time such school is in session," or in an approved private school "for a like period of time," which might mean thirty-six weeks in cities and large towns, while in sparse settlements six weeks might be the limit.

Again, the child labor law provides that a certificate of the age and place of birth, and school attendance, of every child employed in manufacturing establishments shall be kept on file. This sounds well, but experience has shown that crafty parents evade and nullify it by falsifying the ages of their children to suit circumstances. Thus between the inharmony of the laws



and the greed of unscrupulous parents the efforts of the factory inspector fail to accomplish the best results. Two things should be done: first, harmonize and strengthen the labor and truant laws as already indicated; second, so amend the labor law as to require a certified copy of the official record of the date and place of birth of the child to be kept on file wherever children are employed. Then, and not till then, will your factory inspector have in hand reformatory weapons that can be wielded with the best possible effect.

Says John McMackin, commissioner of labor of the great state of New York in his annual report to the legislature:

"So far as the employment of children in factories is concerned, the most urgent need is for amendments that will bring the school law into harmony with the factory law, and that will alter the method of issuing employment certificates so as to remove dependence upon the parents' affidavit and substitute therefor evidence of age from the public records of birth."

Governor Odell of New York believes that child labor on farms needs regulating. In an address at a recent county fair he advanced, somewhat out of the usual course, the following idea as to child labor, which will certainly bear thinking about. He said in part:

"That we have too often looked upon the toil incident to farming as mere drudgery, and that perhaps unwisely, by too early putting the boys to work, we have instilled into their minds a distaste for farm life, is beyond question. Our laws have been framed to prevent the too early employment of the young in our manufacturing pursuits, and if the same consideration were given to the boys upon the farm there would be less of attraction in the glamour of city life."

In Alabama the state child labor committee has agreed upon a bill prohibiting all labor in factories for children under twelve except children of widowed mothers or disabled fathers; all under ten are prohibited absolutely.

Arizona decides that no child can work before reaching the age of sixteen years.

In Illinois the chief difficulty in the way of a rigid enforcement of the present law has been the disposition of parents to falsify in the affidavits regarding age and school attendance of chil-

dren. In order to offset this tendency to evade the law through false affidavits the legislature was asked to raise the age limit from fourteen to sixteen years. A bill prepared by the Child Saving League prohibits the employment of children under fourteen years in any place where intoxicating liquors are sold; and provides that no child under fourteen shall be employed at any work for wages during the hours when the public schools are in session, and that no child under the age of sixteen shall be employed at hazardous work endangering life or limb, or in which health is likely to be impaired or its morals depraved.

#### FACTORY INSPECTION.

The following extracts are taken from an address delivered before the Annual Convention of Factory Inspectors in Montreal, August, 1903, by I. S. Russell, chief clerk of Michigan department of labor:

"There is no more important work connected with state affairs than that of the inspection of the factories and workshops where toiling humanity is closely connected with all the surroundings contained in these institutions. More especially is this true in the states where large manufacturing interests exist. The most progressive states acknowledge these facts. They are the most advanced in enacting effective factory inspection laws and are the most thorough and insistent in demanding the rigid enforcement of those laws.

"As a plain proposition, the state has a right to know what its industries are, their extent, usefulness and value. It not only has the right to know the extent of its industries, the skillfulness of the labor employed in its manufacturing industries, but it is the state's duty to have this knowledge and to know the surroundings of its great mass of laborers, their social conditions, the compensation they receive for their labor, and their general economic habits. Knowing these things, every provision should be made to provide means which will foster the best elements, with a view to constant improvement along the lines of an elevated and refining progression.

"In no way can the information sought be obtained and the true conditions disclosed as through a systematic collection of labor and industrial statistics gathered by the factory inspector

while in the discharge of his duties. Ordinarily industrial statistics are gathered by special canvassers charged with that duty. They obtain their information through the office of the employer, but never know anything of the general working of the factory from which these statistics come, and often care little for the work in their charge beyond having the questions on their canvassing schedules answered, having no knowledge as to whether the information obtained is correct or not. On the other hand, the intelligent factory inspector (and he should be intelligent if permitted to hold his position) is brought in close contact, not only with the employers, but with those his work seeks to benefit. He can see their surroundings and verify or disprove by unerring evidence the statistics given him by those in control. The condition of the factory worker, which is purely labor statistics, should be better known to the factory inspector, through the forces with which he comes in contact, than to any other individual. Often the efficient and successful factory inspector is better informed to give correct data as to many industrial problems than is the manager of these same industrial institutions.

"Experience has taught the officials of the Bureau of Labor and Industrial Statistics of Michigan that the most reliable and trustworthy statistics are collected by the deputy factory inspectors when visiting some of the great industrial manufacturing centers. To illustrate: Michigan has at present some fifteen large Portland cement factories in operation. These plants will average an outlay for building of \$500,000 each. They manufacture nearly 15,000 barrels of this great staple commodity every day; they employ thousands of laborers, some of which is the highest paid skilled labor. Often in their location they are the means of building up thriving little villages. The management of these factories, like other great manufacturing institutions, are generally close-mouthed corporations, loath to impart any information regarding the industry and the labor employed; often refusing a special canvasser even a short interview, and only by dint of dogged perseverance can the canvasser obtain the most meager data, an answer being refused to the more vital questions on the plea that this is their private business and does not concern the state in general. If met by the proposition that the public is interested, the manager responds, 'The public be damned,' or words to that effect.

“The factory inspector, backed by an efficient inspection law, and armed with his badge of authority, visits all parts of the institution, notes the conditions apparent regarding the labor and the industrial product, questions the management as to these conditions, makes his orders requiring changes to comply with the law, gains a standing with the management, who must respect his authority, and before taking his leave his blank statistical schedule has been completely and correctly filled.”

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