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For the Year 1904.

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EIGHTEENTH ANNUAL REPORT

OF THE

BUREAU

OF

Industrial and Labor Statistics

FOR THE

STATE OF MAINE

1904.

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STATE OF MAINE.

OFFICE OF COMMISSIONER OF
INDUSTRIAL AND LABOR STATISTICS,
AUGUSTA, DECEMBER 31, 1904.

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 1904.

Very respectfully,

SAMUEL W. MATTHEWS,
Commissioner.

INTRODUCTION.

The criticism of the work of the Bureau is sometimes made that its investigations are not confined within legitimate limits but are carried into fields not contemplated by the law under which it was established. That this criticism is not well founded is shown by the Act defining the duties imposed upon the Bureau, which is as follows:

"Section 1. There is hereby established a separate and distinct department, which shall be called the Bureau of Industrial and Labor Statistics."

"Section 2. It shall be the duty of this department to collect, assort, systematize, and present in annual reports to the governor, to be by him transmitted biennially to the legislature, statistical details, relating to all departments of labor in the state, especially in its relations to the commercial, industrial, social, educational and sanitary condition of the laboring people; and to the permanent prosperity of the productive industries of the state, and also to inquire into the immediate causes of strikes, lockouts or other disturbances of the relations between employers and employes."

It will be readily seen that the field of operations assigned to the Bureau is a broad and comprehensive one, covering the State with its many and varied industries and interests. With the limited means at his disposal, the commissioner has found it necessary to confine his investigations to a few "departments of labor in the state" each year, making these investigations as complete and reliable as possible. In this way much valuable information as to the resources and development of the State has been obtained and given to the public, and much benefit has undoubtedly accrued from the knowledge thus obtained and disseminated.

It may be as difficult to exhibit *all* the direct benefits to the people of collecting and publishing statistics, as to prove that

direct benefits, real dividends, flow from a public school. It is beyond question nevertheless, that "all forms of useful knowledge add to the power and prosperity, to the enlightenment and rational enjoyment of a community."

Agriculture is one of Maine's most important "departments of labor," and, during the past year, much attention has been given by the Bureau to various investigations connected with this branch of industry. The great county of Aroostook has attained a leading position in agricultural development, and an extended article, entitled "Industrial Aroostook," herein published, will be found of much interest and value. Another important feature of this report is given under the head of "Maine's Milling Industry," this being the first attempt of the Bureau to furnish "statistical details" of the grain and grist mill products of the State. While the results of this investigation are not so full and complete as could be desired, they are sufficiently so as to furnish "food for thought" upon an important subject, the cultivation of bread products.

Market gardening, in the vicinity of our cities and larger towns, has become a feature in our agricultural development worthy of notice, and the article upon that subject will prove interesting and valuable.

"The Potato as a Commercial Crop" is the heading of an extended and very instructive article, showing the extent, value and importance of the potato as a commercial crop in Maine, giving shipments from all sections of the State, both for foreign and home consumption, tables of crop in the State at various periods, as well as official figures covering the amount and value of the potato crops throughout the country.

Of electric light and power plants there are a very large number in the State, including central electric stations, street railway electric stations, and private plants. Returns, more or less complete, have been received from a large number of these plants and much valuable information regarding this important branch of industry and enterprise is thus obtained and given in an extended article herein published.

A revision of list of trade unions in the State, correcting and adding to lists heretofore published, is given in this report.

Other features of the report are statistical facts in regard to railroads, steam and electric, and factories, mills and shops, built during 1904.

The report of the inspector of factories, workshops, mines and quarries is included in the report, according to the requirements of law.

During the past year, prosperity has attended nearly all of Maine's industrial activities. Labor has been well employed and peaceful relations between capital and labor generally maintained. But few strikes, and those of brief duration and insignificant proportions, have taken place.

The commissioner renews his expressions of obligations for faithful and efficient services in the prosecution of his work to his able and competent clerk, Major Charles J. House, and special agents Francis Wiggin and E. M. Blanding.

FACTORIES, MILLS AND SHOPS BUILT DURING 1904.

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 1904?" "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-one cities, towns and plantations report building in this line as follows:

ANDROSCOGGIN COUNTY.

Towns.	Buildings.	What done.	Cost.	Help.
Auburn	Wooden box shop	Built new	$10,000	25
Auburn	Two shoe factories	Reoccupied	-	500
East Livermore	Wood novelty mill	Built new	25,000	150
East Livermore	Iron foundry	Built new	25,000	100
Lewiston	Cotton store house	Built new	60,000	-
Lewiston	Cotton power house	Built new	40,000	-

AROOSTOOK COUNTY.

Caribou	Lumber mill	Enlarged	4,000	-
Crystal	Saw mill	Built new	4,000	8
Eagle Lake Pl	Two saw mills	Enlarged	10,000	200
Easton	Saw and moulding mill	Built new	5,000	6
Fort Fairfield	Starch factory	Built new	4,000	6
Hill Pl	Saw mill	Built new	2,500	20
Linneus	Cheese factory	Built new	1,500	2
Mars Hill	Lumber and starch mill	Built new	3,000	6
No. 18, Range 10	Lumber mill	Built new	15,000	35
No. 18, Range 10	Shingle mill	Built new		
Portage Lake Pl	Shingle mill	Built new	8,000	20
Presque Isle	Saw mill	Built new	20,000	75
Presque Isle	Electric light station	Built new	10,000	25
Reed Pl	Lumber mill	Enlarged	1,000	10
St. Agatha	Starch factory	Built new	4,500	10
Van Buren	Lumber mill	Built new	300,000	175
Van Buren	Shingle mill	Built new		

CUMBERLAND COUNTY.

Naples	Barrel factory	Built new	200	4
Otisfield	Two barrel factories	Built new	-	8
Portland	Solder factory	Built new	18,000	15
Portland	Box factory	Built new	20,000	-
South Portland	Rolling mill	Built new	30,000	150
Westbrook	Handle factory	Remodeled	1,000	10
Windham	Pulp mill	Additions	3,000	-

FRANKLIN COUNTY.

Jay	Barrel factory and saw mill	Built new	4,500	12
Salem	Lumber mill	Built new	5,000	20
Salem	Threshing and grist mill	Built new	300	2
Strong	Lumber, moulding and box mill	Rebuilt	-	-
Wilton	Shoe factory	Built new	100,000	200
Wilton	Birch mill	Built new		
Wilton	Woolen mill	Enlarged		

HANCOCK COUNTY.

Towns.	Buildings.	What done.	Cost.	Help.
Brooklin	Fertilizer factory	Built new		
Brooklin	Clam canning factory	Enlarged	$800	25
Brooklin	Boat building shop	Built new		
Gouldsboro	Sardine factory	Enlarged	20,000	100
Mount Desert	Saw mill	Built new	2,400	8
Penobscot	Saw mill	Built new	2,500	7
Surry	Lumber mill	Built new	1,500	10

KENNEBEC COUNTY.

Albion	Grist mill and job shop	Built new	1,500	2
Belgrade	Button factory	Remodeled	3,000	10
China	Corn canning factory	Built new	3,000	50
Clinton	Clothes dryers manufactory	Enlarged	500	10
Rome	Barrel factory	Rebuilt	1,000	4
Vienna	Barrel factory	Enlarged	100	3
Winthrop	Barrel factory	Built new	4,000	12

KNOX COUNTY.

Cushing	Clam canning factory	Built new	400	10
St. George	Sardine factory	Built new	2,000	25
Thomaston	Brick plant	Built new	15,000	12

LINCOLN COUNTY.

Alna	Lumber mill	Built new	5,000	10
Jefferson	Barrel factory	New machi'ry	500	5
Jefferson	Clapboard mill			
Whitefield	Mill building	Built new	1,000	-
Wiscasset	Grist mill	Enlarged	800	3

OXFORD COUNTY.

Brownfield	Clothing manufactory	Built new	1,000	8
Byron	Birch mill	Built new	1,500	30
Canton	Tannery	Enlarged	4,000	10
Dixfield	Toothpick mill	Built new	7,500	25
Greenwood	Two birch saw mills	Built new	2,400	12
Hartford	Two lumber mills	Built new	1,500	10
Hartford	Barrel factory	Built new		
Hiram	Creamery	Built new	5,000	3
Mexico	Toothpick mill	Built	30,000	75
Oxford	Saw mill	Rebuilt	700	10
Paris	Novelty and toy manufactory	Enlarged	3,000	40
Woodstock	Spool mill store house	Addition	400	-

PENOBSCOT COUNTY.

Bangor	Slaughter house	Built new	15,000	185
Brewer	Tannery	Enlarged	3,000	75
Burlington	Saw mill	Built new	2,000	2
Drew Pl	Lumber mill	Built new	65,000	150
Garland	Grist mill	Repaired	1,000	2
Lincoln	Grist mill	Built new	3,000	6
Newburg	Lumber mill	Built new	1,000	6
Newport	Wool scouring mill	Built new	20,000	40
Old Town	Lumber mill	Built new	30,000	50
Old Town	Electric plant	Built new	36,000	10
Plymouth	Saw mill	Built new	1,500	3

PISCATAQUIS COUNTY.

Brownville	Grist and woodworking mill	Built new	6,000	-
Brownville	Saw mill	New machi'ry	800	6
Greenville	Electric plant and stone crusher	Built new	10,000	3
Willimantic	Shingle mill	Built new	100	3

SAGADAHOC COUNTY.

Towns.	Buildings.	What done.	Cost.	Help.
Richmond	Lumber mill	Built new	$30,000	50

SOMERSET COUNTY.

Concord	Lumber mill	Enlarged	1,000	12
Embden	Lumber mill	Built new	3,000	6
Harmony	Saw mill	Enlarged	2,000	10
Moscow	Saw mill	Rebuilt	300	-

WALDO COUNTY.

Belfast	Blacksmith shop	Built new	1,000	-
Monroe	Saw mill	Built new	800	4
Palermo	Lumber mill	Built new	3,000	10
Troy	Butter and cheese factory	Built new	500	3
Winterport	Saw mill	Built new	500	3
Winterport	Cooper shop	Built new	400	2

WASHINGTON COUNTY.

Deblois	Lumber mill	Built new	1,500	4
Edmunds	Saw mill	New machi'ry	1,500	35
G'd Lake Stream Pl.	Snow shoe & moccasin factory	Built new	100	4
Jonesport	Sardine factory	Enlarged	3,000	-
Machias	Blueberry canning factory	Built new	1,500	10
Marion	Lumber mill	Built new	2,000	8
Robbinston	Sardine factory	Built new	3,000	75
Roque Bluffs	Fish smoking plant	Built new	6,000	12
Whiting	Lumber mill	Built new	3,500	14

YORK COUNTY.

Biddeford	Machine shops	Enlarged	-	100
York	Brick plant	Built new	60,000	50

RECAPITULATION.

Counties.	Number of towns.	Number of buildings.	Total cost.	Hands employed.
Androscoggin	3	7	$160,000	775
Aroostook	14	18	392,500	598
Cumberland	6	8	72,200	187
Franklin	4	7	109,800	234
Hancock	5	7	27,200	150
Kennebec	7	7	13,100	91
Knox	3	3	17,400	47
Lincoln	4	5	7,300	18
Oxford	11	14	57,000	223
Penobscot	10	11	177,500	529
Piscataquis	3	4	16,900	12
Sagadahoc	1	1	30,000	50
Somerset	4	4	6,300	28
Waldo	5	6	6,200	22
Washington	9	9	22,100	162
York	2	2	60,000	150
Total	91	113	$1,175,500	3,276

TOTALS FOR FOURTEEN 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
1904	91	113	1,175,500	3,276

INDUSTRIAL AROOSTOOK.

DESCRIPTIVE.

Aroostook county is a magnificent domain, in area far exceeding any other county in the State, and in population surpassed only by the three counties of Cumberland, Penobscot and York, while in the wealth of natural resources, only yet partially developed, there is probably no area of like extent in Maine that can equal it.

Aroostook county was originally part of the counties of Penobscot and Washington and was established May 2, 1839, by act of the legislature approved March 16, 1839. It was enlarged in 1843 by an addition from Penobscot county and in 1844 by additions from Piscataquis and Somerset counties. On the north and east it borders upon the Province of New Brunswick, while its northwestern boundary is the Province of Quebec, and on the south it adjoins the counties of Washington, Penobscot, Piscataquis and Somerset. In land area it comprises 6,700 square miles, more than one-fifth of the entire State.

Aroostook county is watered by many rivers, especially notable among them being the St. John, which, from its source in northwestern Maine, flows many miles through the county, throughout part of its course constituting the boundary line separating Aroostook from New Brunswick and, after a run of hundreds of miles, finding its outlet in the Bay of Fundy. Many of the large tributaries of the St. John are in Aroostook county practically through their entire course, among them being the Allagash, Fish, Aroostook, Machias, St. Croix, Madawaska, and the Meduxnekeag rivers. The Mattawamkeag, a tributary of the Penobscot, drains the southern part of the county.

Only a comparatively small portion of this great county is as yet settled, and in its 180 townships, the most of which are six miles square, there are only 42 incorporated towns and 29 organized plantations. Yet it had a population of upwards of 60,000

and an assessed valuation of over $18,000,000 in 1900, and has since very materially increased. Great tracts of wilderness have been transformed into flourishing farms, and small settlements have grown into thriving communities. The larger villages have assumed truly metropolitan proportions and characteristics, with substantial business blocks, handsome modern residences, churches, schools and public buildings. They are provided with first-class systems of waterworks, sewerage and electric lights, and numerous banks are doing a prosperous business.

The soil in the river valleys consists of a rich loam several feet deep, vegetable mould being sometimes found at the depth of ten feet. The bedrock is a calcareous slate, and the soil is rich in lime and other essential elements of plant food. Its fertility is unsurpassed in any section of the State, yielding bountiful crops for many years in succession with but little fertilization.

In different parts of the county are found the ores of iron, also sandstone, limestone, marble and roofing slate. There are numerous rich beds of clay suitable and ample for the manufacture of brick for building purposes. Many of the eastern townships are so free from stone that it is frequently found difficult to obtain enough for stoning up cellars and the hewn trunks of huge cedars are often substituted.

The surface of the country is undulating or gently rolling, with few mountains or high hills and scarcely any level plains except the intervale belts on the rivers. The greater part of the county is covered by the primeval forests, their composition varying in different sections. Large areas are covered with heavy hardwood growth, consisting largely of the sugar maple, birch and beech, and scattered through this growth are huge cedars, as large and as tall as the surrounding trees. In the northern half of the county the cone-bearing trees predominate, such as the fir, spruce and pine, although these trees occur more or less scattered throughout southern Aroostook.

POPULATION AND WEALTH.

The remarkable growth of Aroostook county in population and industrial activities is strikingly evidenced by the census figures. The population was 7,535 in 1840 exclusive of those living north of the St. John river who were included in that census, but who later were decided to be in British territory,

12,529 in 1850, 22,449 in 1860, 29,609 in 1870, 41,393 in 1880, 49,589 in 1890, and 60,744 in 1900. The valuation of the county, always including wild lands, as fixed by the legislature except in 1900 when it was fixed by the board of state assessors, was $491,843 in 1840, $537,438 in 1850, $1,856,237 in 1860, $4,995,685 in 1870, $7,564,932 in 1880, $15,422,232 in 1890, and $18,133,491 in 1900. The years intervening since 1900, the date of the last census, have been characterized by remarkable advancement both in population and wealth, while the outlook for the future is full of promise.

ROADS.

Aroostook's growth and development is inseparably linked with its mediums of communication with the outside world. The region was first brought into prominence in 1826 when arose the northeastern boundary dispute. To provide for an emergency the United States government early sent troops to Houlton. These troops were conveyed up the Penobscot and Mattawamkeag rivers in boats and thence overland through the woods to what is now the flourishing shire town of Aroostook county.

In 1828 Congress provided for a military road between Bangor and Houlton and the same was completed in 1830. This was a turnpike road, 32 feet in width, and one of the best in the country. It begins at the Mattanawcook stream in Lincoln and reaches northward to Molunkus, thence northeasterly to Haynesville and onward to Houlton. This road has been maintained in fairly good condition ever since and has been universally styled the "Military road." Later another highway called the "West Aroostook road" was constructed northward, leaving the Military road at Molunkus and extending to Patten and Ashland, later being built to Fort Kent. A highway called the "East Aroostook road" was constructed northward from Houlton and thus the county was to some extent opened up, the Military road providing communication with the outside world.

RAILROADS.

Aroostook county had its first railroad about a third of a century ago. In the early seventies the New Brunswick and Canada Railway built a broad gauge road into Houlton. A few

years later the New Brunswick Railway built a narrow gauge road into Fort Fairfield and Caribou, and eventually to Presque Isle. Later the New Brunswick Railway acquired the Houlton division, narrowing it to standard gauge, and also changing its narrow gauge road in the Aroostook river valley to standard gauge. Later the New Brunswick Railway was absorbed by the Canadian Pacific Railway and today it is a part of that great transcontinental system.

It had long been the dream of Aroostook people to have direct rail communication with the outside world over American soil, rather than by the circuitous route through the Dominion of Canada, and on February 3, 1891, through the enterprise of Franklin W. Cram and Albert A. Burleigh and their associates, the Bangor and Aroostook Railroad Company was organized to provide direct communication between Aroostook county and Bangor and points south and west. The new line reached Houlton in 1893, and Presque Isle, Fort Fairfield and Caribou in 1894, with extensions later to Limestone, Van Buren and Ashland, and in 1902 to Fort Kent. The Bangor and Aroostook Railroad has today a mileage of 428.45 miles, with superb rolling stock equipment and is universally recognized as one of the most progressive and up-to-date railway lines in the East. Its officers are as follows: President, Franklin W. Cram, Bangor; vice president, Albert A. Burleigh, Houlton; treasurer, Edward Stetson, Bangor; general manager, George M. Houghton, Bangor; general passenger and ticket agent, C. C. Brown, Bangor.

That the Bangor and Aroostook Railroad has been a potential factor in the development of Aroostook county is evidenced by a statement of freight traffic movement. The figures given below cover the entire system, and therefore include shipments from Piscataquis and Penobscot county points, but the great bulk of the shipments are from Aroostook. The freight originating on the Bangor and Aroostook Railroad during the year ending June 30, 1904, was as follows, the figures being given in pounds: Agricultural implements, 1,316,800; bar and sheet metal, 4,520; bark, 26,546,770; brick, 5,565,210; castings and machinery, 2,505,096; cement, 1,136,860; cloth from woolen mills, 885,313; coal, anthracite, 448,017; coal, bituminous, 9,964,720; commodities not otherwise specified, 9,897,528; cordwood, slabs and edgings, 91,933,120; cotton, 50,670; dressed meat,

318,267; eggs, 22,744; excelsior, 14,085,810; fertilizers, 12,413,-630; flour, 2,168,540; fruit and vegetables, 2,838,343; grain, 7,767,808; hay, 51,453,089; hides and other tannery supplies, 771,075; household goods and furniture, 2,887,414; iron, pig and bloom, 1,328,070; iron and steel rails, 3,550; kindling wood, 5,233,900; knees, 76,480; last blocks, 3,233,600; laths, 22,577,-065; leather, 5,166,479; lime, 3,250,185; live stock, 9,389,435; logs, poles, posts, etc., 92,477,220; lumber, 249,745,324; merchandise, 8,743,897; mill products other than flour, 1,541,430; oils, petroleum and other, 678,790; packing house products other than dressed meats, 885,424; pegwood, machine, boot and shoe shanks, 635,450; pork and beef, 691,960; potatoes, 336,-279,579; poultry, game and fish, 136,575; pulpwood, 154,801,-490; salt, 916,831; sand, 16,912,100; seed, 466,682; shingles, 38,500,553; ship timber, 6,162,495; shooks, 17,638,604; slate, 23,400,305; spools and spool bars, 63,132,820; starch, 12,137,-921; stone, 931,335; straw, 3,894,980; sugar, 336,395; ties, 35,-503,810; tobacco, 48,911; veneers, 3,225,580; wagons, carriages and tools, 772,705; wines, liquors and beers, 275,220; wood ashes, 296,700; wool, 1,339,006; wood pulp, 8,298,510; paper, 144,064,619; sulphur, 30,000, besides freight belonging to the road amounting to 164,752,671 pounds, the total being 1,684,-896,000 pounds. In addition to the above there were received from other roads and carriers 511,000,225 pounds, making a grand total of 2,195,896,225 pounds, or 1,097,948 tons.

TELEPHONES.

That the people of Aroostook are thoroughly up-to-date in the adoption of modern business methods is evidenced by the use made of the telephone. The White Mountain Telephone Company which is in affiliation with the New England Telephone and Telegraph Company have inaugurated, with marked success, the Farmers' Long Distance Telephone Service. Early in the fall of 1904 the number of farmers who had contracted for this service had reached 950 and additional subscribers are continually being added.

The Aroostook Farmers' Telephone and Telegraph Company has also entered the field and is extending its lines throughout the county. Its organization was effected at Robinson's in the town of Blaine, August 11, 1904, the officers being as follows:

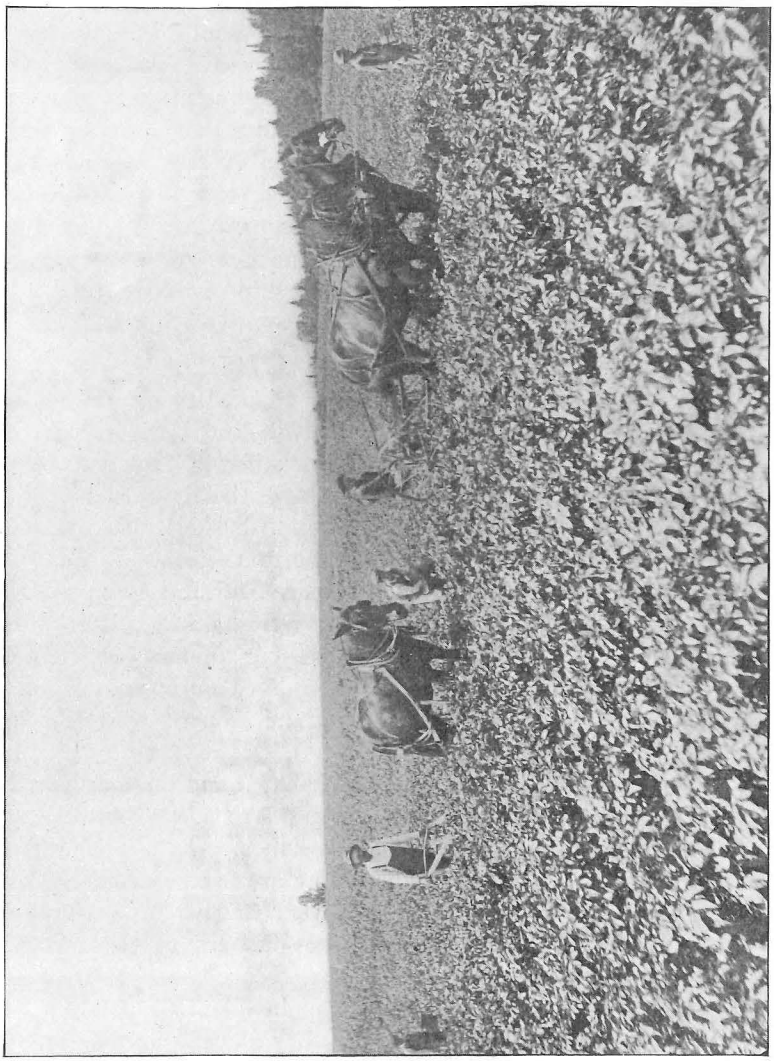
President, F. A. Hackett; vice president, B. H. Sanborn; secretary, George W. Young; treasurer, H. O. Hussey. The directors are Hon. Henry C. Sharp of Monticello, Dr. W. W. White of Bridgewater, F. A. Hackett of Robinson's, C. E. Folsom of Bridgewater, and A. J. Fulton of Blaine, leaving other directors to be added as other towns are reached and stock taken. The capital stock is $100,000, and any business man or farmer may become a stockholder by taking shares and by vote of the company. No stock can be taken by any person not a resident of the county, and no one can sell stock to a person not a resident of the county. The new company has the endorsement of the Aroostook County Pomona Grange, which represents seventeen granges with a membership of nearly 3,000.

POTATOES.

The soil of the county is peculiarly adapted to the raising of potatoes. As illustrative of the growth and development of Aroostook's potato industry it is interesting to note that from the small beginnings of thirty years ago, the shipments of the crop of 1903 amounted to over 6,000,000 bushels. In addition to the above, 1,600,000 bushels went to the starch factories. Then a large quantity has been required for the home use of the more than sixty thousand people residing within the limits of the county, while a steadily increasing amount is required each season by Aroostook farmers for seed purposes. A conservative estimate for the county of the crop of 1903 is over 11,000,000 bushels.

Aroostook potatoes are widely distributed and the long potato trains sent forward over the Bangor and Aroostook Railroad go, in many instances, very extended distances. Large quantities find a market in the South where they are used extensively for planting. Aroostook potatoes are very hardy and admirably adapted for seed purposes, but the planters of the South, although able to produce a fair crop, secure more satisfactory results by using Northern seed than by planting potatoes of their own production. Therefore they depend largely upon the North for their seed potatoes and the outcome is that Aroostook tubers are sent by the hundreds of carloads into North Carolina, South Carolina, Georgia, Texas, and other Southern states. Great quantities are also sent into the Middle

West, notably Ohio, Michigan, and Minnesota, for seed purposes. Shipments have also been made to as distant lands as South Africa and Australia. Great quantities are also sent to



CULTIVATING AN AROOSTOOK POTATO FIELD.

New England points and to New York, where they are always in demand for food purposes.

The crop of 1903 was exceptionally large and the potatoes were almost uniformly of large size, there being a notable

absence of small tubers. Another distinctive feature, and one highly gratifying to Aroostook farmers, was that high prices prevailed throughout the shipping season. In fact, during the year all previous records were eclipsed and a portion of the crop brought as high figures as $3.00 per barrel. Wealth came in bounteous measure to the Aroostook farmers as the outcome of the high prices prevailing during the year, and on every hand, throughout the county, is to be seen evidence of thrift and prosperity.

While the Aroostook farms do not compare in area with those of the West, yet many of them are of large size. Farms of 500 acres and upwards are not unusual, and oldtime methods have given way to the most modern system of scientific farming. Everywhere that it is possible hand labor has been supplanted by machinery and thus the cost of production has been greatly reduced. Everything is conducted on a large scale and, owing to the shortness of the seasons, a great amount of work is necessarily crowded into a few months.

Hon. E. E. Parkhurst, with his sons, is interested in three farms in the vicinity of Presque Isle. They cultivate about forty varieties of potatoes for seed only, planting not less than one hundred acres each year. Their average yield of course varies from year to year, but the Parkhursts say it is safe to put it at 240 to 250 bushels per acre. E. L. Hayden of Presque Isle is one of the largest growers in that vicinity and during 1904 had about 80 acres in potatoes, his average for four years having been about 60 acres. Leslie J. Bean of Presque Isle had, during the season of 1904, about 85 acres in potatoes, and Charles F. A. Phair, also of Presque Isle, 60 acres. Frank Higgins of Maysville Center is another large grower, his average for four years past having been 50 to 65 acres.

Among the large potato growers in and about Fort Fairfield are the J. V. Bayless Seed Company, 60 to 70 acres; George Churchill, 50 acres; Charles Fisher, 50 acres; George Fisher, 50 acres; Henry Davis, 50 acres; and P. H. Reed, 52 acres.

Prominent among the large potato growers in Caribou is the George W. P. Jerrard Company, which raises seed potatoes on a very extensive scale. Mention is made above of only a few, but there are many other large growers, while throughout the county there are a host of farmers who grow from 20 to 40 acres. As we get back into the newer townships, further from

the railroad stations, the acreage decreases to as low as four or five acres.

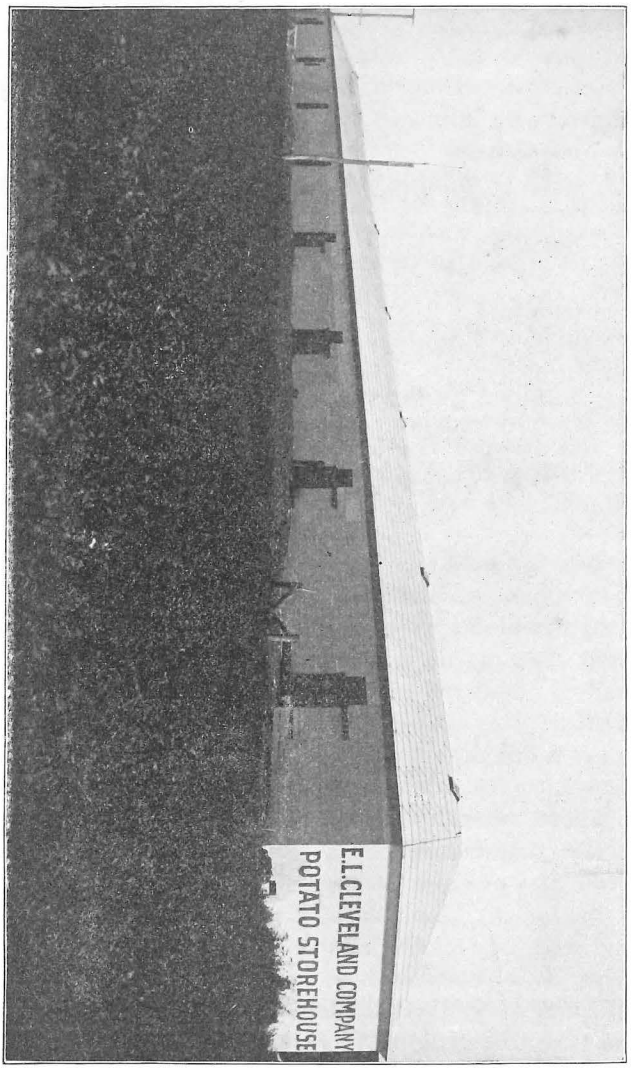
There are a large number of potato shippers throughout the county and times are lively as soon as the potatoes have been harvested and are ready to be sent forward to market. The E. L. Cleveland Company of Houlton reports having shipped in the vicinity of 1,000 carloads of the crop of 1903. Manager George E. Robinson of the Robinson Company, Presque Isle, reports the shipment of about 200,000 barrels, constituting upwards of 900 carloads. Carter and Corey of Presque Isle, representing a large New York interest, make very extensive shipments throughout the season. Irving and Ricker of Caribou shipped, during the season, 106,000 barrels, constituting 530 carloads. P. H. Reed of Fort Fairfield shipped in the vicinity of 80,000 barrels, constituting 430 carloads, chiefly fancy seedlings. In the above enumeration mention is necessarily made of only a few of the more prominent shippers among the many engaged in the business which has assumed very large proportions and is steadily expanding.

Throughout Aroostook county there are very many potato storehouses and at the leading shipping points they are especially numerous, a single firm in some instances having a dozen or more potato houses in different parts of the county.

On the Bangor and Aroostook Railroad, in the immediate vicinity of the Mars Hill and Blaine station, have been erected, during 1904, two large potato houses. Early in the season the potato houses there were consumed by fire and the two spacious structures just built take the place of the buildings burned.

The most northerly of the new structures is 440 feet long by 40 feet wide and is divided into four sections, owned respectively by the E. L. Cleveland Company of Houlton, J. D. Robinson, Safford and York, and York and Hersom, each section being 110 feet long by 40 feet wide. The building is fourteen feet posted above the sills and the roof and walls are covered with asbestos roofing. The sills are 8 by 8 inches and the studding 2 by 5. The walls are boarded up on both sides of the studding and between are five inches of sawdust. On the inner side of the walls is a three inch air space through which hot air is circulated from the cellar. The building is piped throughout for steam, there being between 2,000 and 3,000 feet of pipes. The

steam plant is 33 feet from the potato house, being 8 by 15 feet, with concrete walls and asbestos roofing.



THE BIG POTATO HOUSE AT MARS HILL STATION.

The southerly potato house is 380 feet long by 40 feet wide and is divided into four sections, but not of equal size. One of these is 60 by 40 feet and built by Samuel Currie, another 80 by 40 feet belonging to Gilbert Graham, and the other two, of 120

by 40 feet each, are controlled by R. J. Colbroth, and Pitcher, White and Company. This building is also to be equipped with steam heat. In design and appointments these houses have not a superior in Aroostook county or elsewhere.

In regard to the Aroostook potato display made by the State of Maine commissioners at the St. Louis Exposition, Hon. E. E. Parkhurst, who furnished the exhibit, writes:

"It was composed of fifty varieties of potatoes, put up in bushel crates, three bushels of each variety, and three crates, of a bushel each, of the largest specimens I could collect. Three varieties of these I obtained from the Johnson Seed Company of Richmond, Maine; ten varieties from the Jerrard Seed Company, Caribou; two varieties from Carter and Corey, Presque Isle; and two varieties from the Robinson Company of Presque Isle. Thirty-three of the varieties were selected from stock grown on my own seed farms. I understand the object of the commissioners in calling for three bushels of each variety was that they might place on exhibition, at one time, the fifty varieties and keep them on exhibition for one month, then take from the cold storage fifty more crates which would be fresh and hard and sound, and thus have good, fine looking stock on exhibition all the time."

Aroostook's potato crop in 1904 is probably equal to that of 1903 in volume and superior in quality. Throughout the summer the conditions were ideal and never were crop prospects brighter than in August when the special agent of the Maine Bureau of Industrial and Labor Statistics made an extensive tour of the great potato fields of Aroostook. The large crop this year is due not so much to increased acreage as to improved methods, fertilizers being used in much larger quantities than ever before, while the spraying of the vines has been adopted generally, thus reducing to a minimum the losses by blight.

While fifty or more varieties of potatoes are raised in Aroostook, the Green Mountain largely predominates. During the second week of October, and before the harvesting of the crop of 1904 was completed, a cold spell of unusual severity for the time of year, visited Aroostook. Fears were entertained at the time that many of those not then dug had been affected by the freeze, but the loss proved to be small, and the few so damaged were not a total loss as they were used by the starch factories.

STARCH.

Intimately associated with the growth and development of potato raising in the county is the manufacture of starch. A third of a century has passed since the inauguration of the industry in Aroostook and from small beginnings it has steadily expanded until it now ranks among the prominent industries of the county.

Investigation discloses that there are in Maine today 66 starch factories. All of these are located in Aroostook county with the exception of two, the latter being in the towns of Patten and Springfield respectively, both in Penobscot county. There was a third factory in Penobscot county near Braggville station in Stacyville plantation, but it was destroyed in the disastrous forest conflagration which visited that section in the spring of 1903. Several new factories were erected in Aroostook county in 1904 and a company has been organized to establish a starch plant in the southwestern part of Penobscot county, either in Corinna or Newport. A movement has also been started to build a factory at South Dover in Piscataquis county, and a similar enterprise has been agitated at Norridgewock in Somerset county.

Among the pioneer starch factories in Aroostook county was that built in 1871 by George and Elmer Hibbard at Drew's lake in New Limerick, and which was destroyed by fire in the early eighties. The Hibbards came from New Hampshire, as also did Albe Holmes and several others who figured conspicuously in the early days of Aroostook's starch industry. It was in 1872 that Albe Holmes reared in Caribou a starch factory of very large size, and about the same time one was built at Presque Isle. From that time factories continued to spring up and for more than twenty-five years the starch industry has been a very potential factor in the growth and development of Aroostook county.

Numerous factories have been destroyed by fire, but those burned have usually been replaced by new, while still others have been erected until now the county is dotted with them from Sherman in the south to Fort Kent in the extreme north. Among the new factories built in 1904 is a large one at Goodrich in Fort Fairfield, owned by numerous farmers of that vicinity. Another starch factory has just been completed at Frenchville, and one has also been built at Mars Hill, at the latter place replacing one that had been burned.

The following is a complete list of the starch factories in Maine at the present time:

Ashland, G. B. Hayward.

Blaine, T. H. Phair (Presque Isle post office).

Bridgewater, A. L. Chandler.

Caribou, M. A. Barrett, W. B. Hall, E. A. Holmes, H. E. Jones, T. H. Phair (2) (Presque Isle post office).

Cary Plantation, Cleveland and Ludwig (Houlton post office).

Connor plantation, E. A. Holmes (Caribou post office).

Easton, Hill and Turgeon, T. H. Phair (Presque Isle post office).

Fort Fairfield, Aroostook Valley Starch Company, Bayless and Bard, Austin M. Foss, Horace E. Jones (Caribou post office), J. Lundy, Charles S. Osborne, Perry and Foss, Farmers' Co-operative Company (Goodrich), T. H. Phair (Presque Isle post office).

Fort Kent, George H. Page.

Frenchville, Israel Ouellette, M. A. Gagnon, M. Michaud.

Grand Isle, Van Buren Lumber Company (Van Buren post office).

Hamlin Plantation, Trafton and Bard.

Houlton, Aroostook Produce Company, Mansur, Peabody and Company, John Watson (2).

Limestone, J. B. Durepo and Son, J. M. Noyes and Sons, Trafton and Bard, J. M. Ward, T. H. Phair (2) (Presque Isle post office).

Littleton, John Watson (Houlton post office).

Madawaska, Beloni Hebert.

Mapleton, T. H. Phair (Presque Isle post office).

Mars Hill, Frost and Rees.

Masardis, G. B. Hayward (Ashland post office).

Monticello, John Watson (Houlton post office).

New Limerick, John Watson (Houlton post office).

New Sweden, New Sweden Starch Company, Jacob Hedman (Jemtland post office).

Patten, Piper and Clark.

Perham, T. H. Phair (Presque Isle post office).

Presque Isle, T. H. Phair (3), C. F. A. Phair, Horace E. Jones (Caribou post office).

Sherman, Joseph Piper (Colebrook, N . H., post office).

Smyrna, John Watson (Houlton post office).

Springfield, O. W. Gardner.

St. Agatha, Michel Michaud.

Van Buren, Van Buren Mercantile Company, Joseph Martin and Son.

Washburn, T. H. Phair (2) (Presque Isle post office).

Weston, Thomas S. Gilpatrick.

Westfield Plantation, Briggs and Willey.

Woodland, George O. Goodwin, New Sweden Starch Company (New Sweden post office).

The largest owner of Aroostook starch factories is Hon. Thomas H. Phair of Presque Isle, who has justly been styled the "Starch King." Since the season of 1903 Mr. Phair has sold his Patten factory but he still has fourteen, as follows: One in Blaine, two in Caribou, one in Easton, one in Fort Fairfield, two in Limestone, one in Mapleton, one in Perham, three in Presque Isle, and two in Washburn, while his son, Charles F. A. Phair, also has one in Presque Isle. John Watson of Houlton is second in the volume of starch production with six factories, two of these being in Houlton and one each in Monticello, Littleton, New Limerick and Smyrna.

For a considerable number of years Aroostook boasted of the only woman starch manufacturer in America. Mrs. G. M. Frye for a dozen years operated very successfully a factory at Sherman Mills. She has now retired from active management of the plant, but continues to take enthusiastic interest in an industry which means so much for the prosperity of her home county and is one of the best authorities on the Aroostook starch industry.

The investigations made by the special agent of the Maine Bureau of Industrial and Labor Statistics cover the season of 1903. As has been outlined in preceding pages, the potato crop of that year was exceedingly large, but there was an unusual absence of small potatoes, while the high prices prevalent throughout the season had a tendency to keep potatoes away from the starch factories. Therefore the total starch production fell considerably below that of some preceding years. The banner season was that of 1895 when in the vicinity of 10,000 tons were manufactured. Usually the factories are operated in the fall only, but there have been springs when some of them were set in operation.

There is a wide difference in the amount of starch in potatoes from one season to another. Then an important factor is the price that starch brings in the market. In earlier years starch sold as a rule at much higher prices than have of late been obtainable. Aroostook starch is used largely by the great cotton bleacheries, and when depression reigns in the textile market and mills are down for a more or less extended period this industry is, of course, very materially affected. The long shut down at Fall River, Massachusetts, New England's greatest cotton manufacturing center, has had a depressing effect on the starch industry and Aroostook manufacturers are not, therefore, particularly sanguine for the outlook in 1904.

A visit to a starch factory is one full of interest to all observing persons. We give a description of the process of making starch as it is done at the fine starch factory of John Watson at Monticello, although the process is essentially about the same in all starch factories. The potatoes are received from the team and dumped into the hopper, passing on from that to a revolving tube twenty-eight inches in diameter at one end, thirty-three inches at the other end, and making about seventy-five revolutions a minute. A stream of water under pressure is applied to this tube, which removes the rough dirt from the potatoes as they pass on to the washer, which is supplied with streams of water by the pumps, and here the potatoes are washed perfectly clean.

From the washer they pass on to an elevator which carries them to the grater. The grater is made of wood, with iron heads, and is covered with grater iron. It is twenty-six inches in diameter, four feet long, and makes 500 revolutions per minute. The grated potatoes fall upon a fine brass wire sieve, and the starch, being washed out by streams of water, falls through the sieve into a tank below, while the pumice passes over the end of the sieve, and so onward into the river.

The content of the tank is pumped into the settling vats where it is allowed to remain six or eight hours in order to settle, according to the temperature of the water. The starch settles to the bottom and the water is drawn off. The starch is then shovelled over into vats provided with large stirrers. Fresh water is pumped in, the whole thoroughly mixed, and then pumped up into settling vats again. Here it is allowed to remain twenty-four hours to settle. The water is then drawn

off, the good starch having settled to the bottom. On top there is an impure starch which is called grains. This impure starch is put into a vat called the grain vat. Fresh water is applied and the whole thoroughly mixed, and then the contents are allowed to settle. The portion that does not settle is run off into another vat, which is provided with a stirrer and which has vents, one above the other. The pure starch will settle towards the bottom, and is found and drawn off by means of the vents. All the starch is then allowed to remain until the following day so that the water still mixed with it may separate and rise to the surface. The water being drawn off, the starch is shovelled out, thoroughly pulverized, and then distributed on the racks in the dry house. After a batch of starch is put upon the racks, the kilns are closed, the ventilators are opened, the steam is turned on, and the process of drying the batch goes on rapidly. For the first twelve hours the temperature is kept at about 160 degrees of heat; the balance of the time the heat is increased to 190 or 200 degrees. The process of drying requires about twenty-four hours. The tables beneath the racks, on which the starch falls, are made of indurated fiber board, and are not affected by heat or moisture. The starch as it leaves the dry house should not contain above fifteen per cent of moisture.

The starch is next conveyed to the storehouse, the lower part of which is in one large tightly sealed room, and dumped in, where it is allowed to cool. It is then put into casks holding from 650 to 700 pounds net each. These casks are made of spruce and fir, the heads being made of spruce generally. They are manufactured in the county and generally at the factory. E. A. Holmes of Caribou, who operates two starch factories, makes the casks for three other factories, or five in all.

An exhaustive personal investigation, supplemented by official returns from most of the leading manufacturers, disclosed that during the season of 1903 the Maine starch factories manufactured in the vicinity of 6,500 tons of starch. The factories were in operation a length of time ranging from 18 days to 60 days, the average being about forty days. The number of hands employed ranged from five in the smaller ones to an average of thirteen in the larger factories, the aggregate being in

the vicinity of 700 hands. In a few instances women were employed, but the help is almost exclusively male.

During the season of 1903 the prices paid for starch potatoes ranged from 12 cents to 20 cents per bushel, the average being in the vicinity of 15 cents per bushel, or 35 to 40 cents per barrel, two and three quarters bushels constituting a barrel. More than 1,600,000 bushels of starch potatoes were consumed by the factories, for which the farmers received upwards of $240,000. The factories paid out directly for labor between $40,000 and $50,000. In addition to the cost of potatoes and labor there is the wood, cartage, freight, commission, interest, taxes and insurance, as also the repairs which is quite an item. In the opinion of a prominent manufacturer, the total cost of manufacturing starch, including labor, taxes, interest, freight, etc., is not less than $20 per ton, in addition to the cost of potatoes.

The average amount of starch secured from a bushel of potatoes is eight pounds and therefore 250 bushels are required to make a ton of starch.

The price of starch is liable to fluctuations and the figures the past season have ranged from two and a half to four cents per pound. The total value of the Maine starch manufactured during 1903 is estimated at $400,000. Especially helpful to Aroostook are the starch factories in that they furnish a ready market, at fairly remunerative prices, for small and unmerchantable potatoes.

FLOUR MILLS.

The rise and growth of the roller flour industry of Aroostook marks an important advance in the industrial development of Maine's northern county. The history of wheat itself, found in the tombs of Egypt and old in the days of the Pharaohs, is interesting, and entertaining also is the history of milling from the days of the saddle-stone, mortar and quern to the introduction of the roller flour process in 1878. History recalls that George Washington was a miller and the Father of his Country raised wheat, ground flour, and exported it to Europe and the West Indies, the fame of his Mount Vernon brand being world wide.

The inauguration of the roller flour industry in Aroostook dates from 1897, D. E. Edwards of Fort Fairfield being the

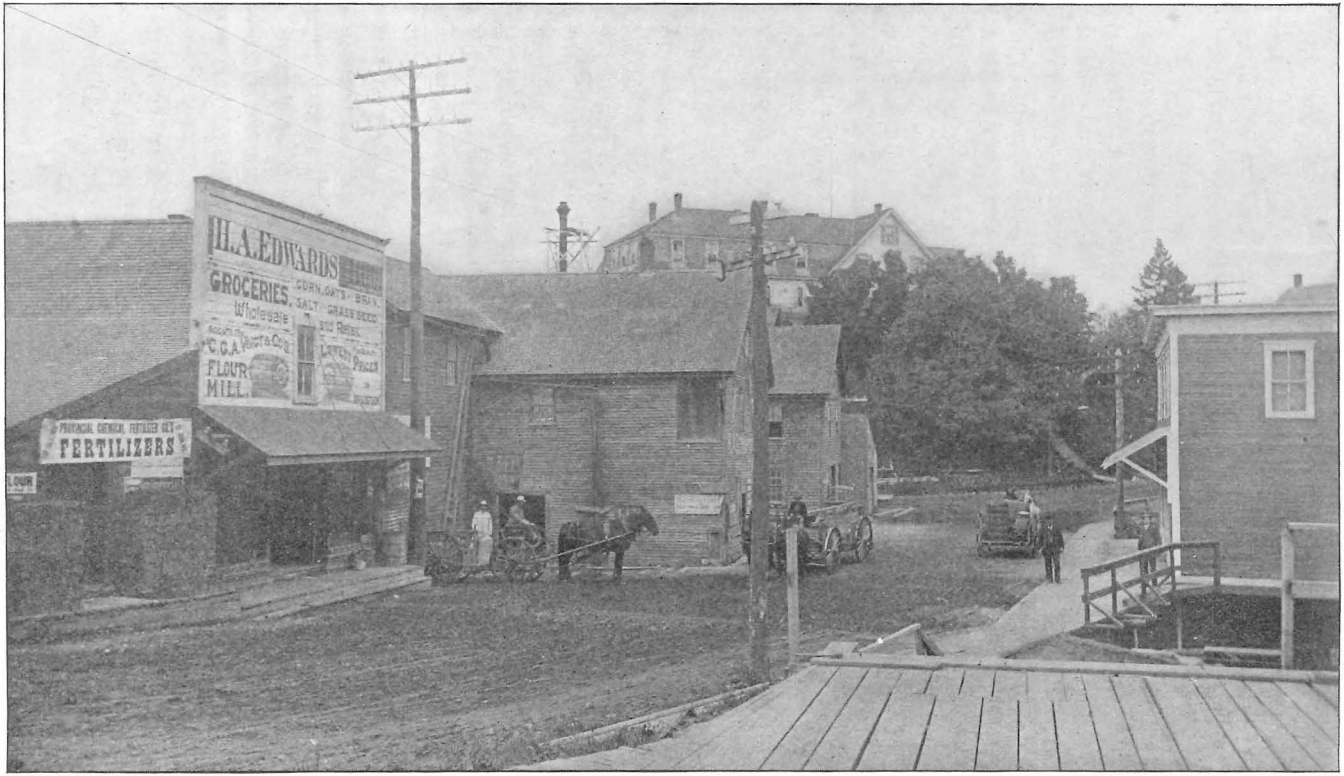
pioneer. The original mill at Fort Fairfield was followed later by two plants erected at Caribou, one by H. A. Edwards and Company and the other by S. W. Collins and Son; and by plants established by Pirington and Cox at Presque Isle, Thomas H. Phair at Washburn, Dilling and York at Mars Hill, and E. Merritt and Sons at Houlton. Summarizing our investigation there are in Aroostook county today seven roller flour mills with an equipment of 26 double stands of rolls and a total capacity of 310 barrels of flour in a day of twenty-four hours.

The Houlton roller flour mill, E. Merritt and Sons proprietors, is not only the largest in Aroostook county, but in New England as well. It was built in 1901 and has a capacity of 60 barrels of flour in twenty-four hours. There are five machines with two pairs of rolls each and the equipment is thoroughly modern. The flour is put up in bags and barrels, and a favorite brand is Merritt's Best. Cereals are also put up at this establishment, one of their specialties being Sugar-Nut, which enjoys quite an extended sale throughout Aroostook county. They also put up graham meal.

D. E. Edwards built, in Fort Fairfield, in 1897, the first roller flour mill in Aroostook county. This mill has an equipment of four double stands of rolls and a capacity of 35 barrels of flour in a day of twenty-four hours. The plant is run largely on custom work and there is a stave mill in connection. Mr. Edwards, in addition to his Fort Fairfield mill, is building another roller flour mill at Four Falls, New Brunswick, about a mile below the Aroostook falls. The new mill will have four double stands of rolls and a daily capacity of forty barrels.

H. A. Edwards and Company at Caribou has a roller flour mill with three stands of rolls and a daily capacity of fifty barrels of flour. The work is largely custom. The mill has been in successful operation about five years. S. W. Collins and Son have at Caribou a roller flour mill established the same year as that of H. A. Edwards and Company. The plant has an equipment of four double stands of rolls and a capacity of 60 barrels of flour in twenty-four hours.

Pirington and Cox five years ago established a roller flour mill at Presque Isle. It is a four stand mill, with a daily capacity of 50 barrels and is run largely on custom work. Dilling and York at Mars Hill have a roller flour mill with an equipment of three or four stands and a capacity in proportion



THE H. A. EDWARDS FLOUR MILL IN CARIBOU.

thereto. Thomas H. Phair of Presque Isle has a roller flour mill at Washburn, built in 1899. It has two stands of rolls and a capacity of 25 barrels in twenty-four hours.

Aroostook's fertile acres are admirably adapted for the cultivation of wheat and not only is the farmer awarded a liberal return for his labors, but his farm is likewise benefitted thereby. A rotation of crops is conducive to success in agriculture and if a field that has been devoted to potato raising is sown to wheat it is much better thereafter for the growth of tubers. Aroostook lands yield much more freely of wheat than do the prairies of the West, and the harvest ranges from twenty to fifty bushels to the acre, twenty-seven bushels being considered an average crop in the northern part of the county.

The average yield of wheat for the State of Maine in 1903 was 25.5 bushels per acre, whereas the ten great prairie states of Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, and Nebraska, averaged 12.7 bushels for the same year. The average for the whole country was 12.3 bushels. Only three states, Montana, Colorado, and Nevada, exceeded Maine in yield of wheat per acre. The average value of the wheat crop per acre in 1903 was for Maine, $24.99; for the whole country, $8.96.

Many varieties of wheat are grown in Aroostook, among the leading favorites being White Russian, Blue Stem, White Fife and Lost Nation. Since the establishment of the roller mills the amount of wheat grown has considerably increased, so that now the amount of wheat annually ground in the county exceeds the entire crop of the State in 1899.

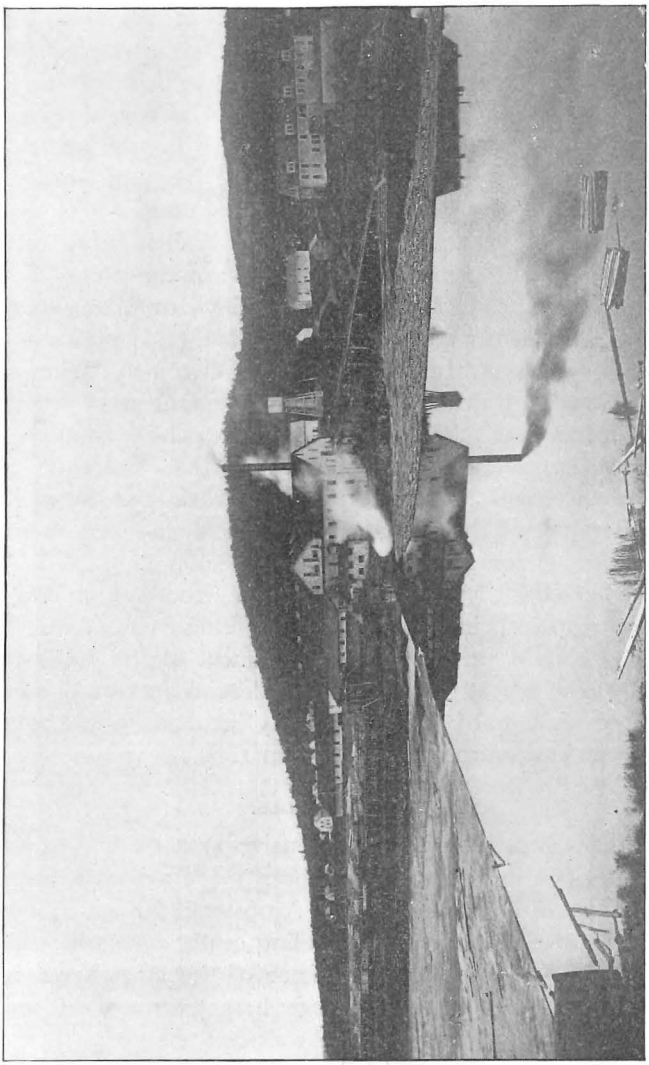
LUMBER MILLS.

Aroostook county, with its extensive area of timber lands, much of which has only recently been made available through the building of the Bangor and Aroostook Railroad and its numerous extensions, is now a leading center of lumber manufacturing, and here are located some of the largest and most modern sawmills in America. We here give a brief review of some of the leading plants in Aroostook territory.

Aroostook Lumber Company.

The Aroostook Lumber Company, of which Arthur R. Gould is president, and Fred Barker, secretary and treasurer, has sawmills in Presque Isle and Fort Fairfield.

The Presque Isle plant was destroyed by fire early in the season of 1904, but has since been rebuilt. The new building is 70 by 140 feet, and its equipment includes a rotary with a



THE ASHLAND LUMBER MILL.

daily capacity of 50,000 feet of long lumber. The output for the season will be about 5,000,000 feet of long lumber and 2,-000,000 shingles.

Within the past year the Aroostook Lumber Company has acquired by purchase the lumber mill formally owned by the Stevens Lumber Company on the shore of the Aroostook river, about two miles above Fort Fairfield. This mill has been operated by the Aroostook Lumber Company during the season of 1904 and its output is about 2,000,000 feet of long lumber and 25,000,000 shingles. In the Presque Isle and Fort Fairfield mills this company gives employment to a large force of hands, while during the winter months a big crew is kept busy securing the necessary logs for the season's sawing.

Ashland Company.

The Ashland Company has an extensive plant two miles from Ashland village. The plant, as originally established in 1896, was known as the Ashland Manufacturing Company's property, its present title having been adopted upon acquirement of the property in 1903 by Stetson, Cutler and Company of Boston and New York. R. H. Pomeroy is general manager, and J. E. Watters of Bangor, superintendent. The home plant comprises about 150 acres of territory, upon a portion of which, bordering the Aroostook river, is located the mill 230 by 65 feet in size.

The equipment consists of two double cutting band sawmills, three planers, a surfacer, lath and clapboard machines. It also has a department for the preparation of pulp wood, the equipment of which comprises eight barkers, and two chippers. The power plant is equipped with three engines aggregating 800 horse power and a battery of four boilers, one of these engines furnishing operating power for a fully equipped machine shop and a 500 light dynamo by which the plant is illuminated.

The approximate output of the Ashland Company is 125,000 feet of long lumber, 30,000 laths, and 3,000 clapboards daily, requiring the consumption of 30,000,000 feet of spruce and pine timber in a season, procured from the company's lands in northern Aroostook. Employment is furnished to 150 hands about the mill plant the larger part of the year, in addition to which 350 more hands and 80 horses are utilized in the woods during the winter months, in securing the season's supply of logs.

Apart from the manufacturing plant there are conveniently distributed about the premises a storehouse 200 by 50 feet, together with numerous smaller storehouses utilized for varied purposes, an office and general merchandise building, 61 tenement structures, and a boarding house accommodating 135 persons. In addition to this property the company has a storehouse and timber supply plant at Machias lake.

A. L. Chandler.

A. L. Chandler operates a sawmill in Bridgewater, employment being given to 20 hands. The estimated output for the season is 2,000,000 feet of long lumber, and 3,000,000 shingles.

S. W. Collins and Son.

S. W. Collins and Son have a sawmill on the Caribou stream in Caribou, which manufactures in a season about 4,000,000 feet of long lumber and 2,000,000 shingles, and at Collins station, on the Van Buren division of the Bangor and Aroostook Railroad, they have another sawmill, the season's output of which is 2,000,000 feet of long lumber and about 3,500,000 shingles.

Andre R. Cushing.

Andre R. Cushing has a lumber manufacturing plant at the foot of Eagle Lake, in Eagle Lake plantation, and less than a half-mile from the Wallagrass railway station. Mr. Cushing was practically the first lumberman to operate a plant upon the site of these waters, having operated a portable mill in the interest of Allston Cushing and Company a few years since, and which later was merged into the Fish River Lumber Company.

In 1903, Mr. Cushing installed his present plant comprising a rotary sawmill, equipped with a matcher, surfacer, lath machine and two shingle machines, operated by a 175 horse power engine, with an auxiliary engine operating an electric light plant in connection therewith. The present output of the plant aggregates 20,000 feet of long lumber, 30,000 shingles and 25,000 laths daily, with a prospective increase thereof.

Apart from consignment shipments to New York and Boston parties, Mr. Cushing makes a specialty of custom sawing.

Employment is furnished 30 hands practically the whole year in addition to numerous hands in the winter engaged in securing the season's supply of 2,500,000 feet of timber. In connection with the plant is a boarding house of sufficient capacity for the accomodation of the employes.

I. H. Davis.

I. H. Davis has a planing and lumber mill in Houlton, in the management of which he has been identified for ten years. The mill comprises a two-story structure bordering the Meduxnekeag river, from which operating power is derived. The moulding mill is equipped with modern mechanical appliances for the manufacture of building finish and ornamental woodworking. He has not only a large three-story warehouse opposite the mill, but has another located in the immediate vicinity, and an additional storehouse 40 by 90 feet, near the Bangor and Aroostook Railroad station.

Fish River Lumber Company.

The Fish River Lumber Company, of which Parker P. Burleigh of Houlton is treasurer, combines practically three lumber manufacturing plants under one and the same management, the main plant being located in Eagle Lake plantation, with others at Winterville station in Hill plantation and at Howe Brook station respectively. The plant in Eagle Lake plantation borders both on the railroad and Eagle Lake, with numerous spurs of the former conveniently intersecting the property, while the plants at Winterville and Howe Brook are equally well situated and provided for with reference to transportation and supply facilities.

The approximate output of these combined plants at present comprises 205,000 feet of long lumber, 130,000 shingles, 115,000 laths, and 4,500 clapboards daily, requiring 35,000,000 feet of spruce, cedar and pine in a season, and furnishing employment to an aggregate of 275 hands in connection with the several manufacturing plants, with between 600 and 700 hands and 240 horses employed in the woods in the winter securing the season's supply of lumber.

The property in Eagle Lake plantation includes 150 acres or more of land, the equipment of the plant being a rotary saw-mill thoroughly equipped for the purpose, with five planers, matchers and surfacers, a clapboard machine and two lath machines; also a shingle mill, equipped with six machines. The power plant in connection consists of three engines aggregating 750 horse power, with a battery of five boilers, one of the former being utilized in operating the shingle mill and also a 500-light dynamo by which the plant can be illuminated. Added to the foregoing is a fully equipped blacksmith and machine shop, numerous storehouses utilized for various purposes, 25 tenement houses, and a boarding house accommodating 125 persons. The output is 125,000 feet of long lumber, 100,000 shingles, 80,000 laths, and 4,500 clapboards daily.

The property at Winterville is comprised in a 25-acre plant with a rotary mill operated by a 125 horse power engine and boiler, which also includes power for a 100 light dynamo. In addition to the mill property, there are scattered about the premises 25 tenement houses and a boarding house of sufficient capacity for the accommodation of those employes not otherwise provided for. The output at this plant is about 30,000 feet of long lumber daily.

The Howe Brook plant is comprised in about 50 acres, with a rotary saw mill, also a lath machine and two shingle machines. The power plant is equipped with twin engines and two boilers which also furnish power for a 300 light dynamo for illuminating purposes. In addition to the foregoing there are 25 tenement structures, and a boarding house accommodating 50 workmen. The output is 50,000 feet of long lumber, 30,000 shingles and 35,000 laths daily.

Fort Kent Mill Company.

The Fort Kent Mill Company, comprising C. O. Bradbury, John Mullen and L. F. Bradbury, the latter being treasurer, is a very important factor in the development and prosperity of Fort Kent and its outlying territory. The plant, combining a rotary saw and shingle mill, with a grist mill and carding mill in connection, and a general merchandise store nearby, is comprised in a dozen or more acres about a mile from the

railway station, the mill property skirting the Fish river from which operating power is derived. The manufacturing plant is thoroughly equipped in every essential for the varied purposes of its use, the sawmill having in connection therewith a planing, clapboard, lath and three shingle machines, its present output being from 23,000,000 to 25,000,000 shingles and 1,500,000 feet of long lumber, requiring about 4,000,000 feet of spruce and cedar timber annually.

The carding and grist mill are equally well equipped, the latter operated by roller process, having a daily capacity of 400 bushels of buckwheat in addition to mill feed.

The office and general store are located upon the main highway, the stock of the latter comprising a general merchandise assortment and lumbermen's supplies. Employment is furnished to 60 hands in the mill plant, in addition to numerous employes and teams in winter, in securing the season's supply of timber.

W. A. Haines.

W. A. Haines of Fort Fairfield has a sawmill in the suberbs of that town, on a tributary of the Aroostook river. The plant includes a rotary sawmill, a shingle mill, a lath machine, and a stave machine, and is operated by both water and steam, a 78 horse power steam plant supplementing the water power. The daily output of the plant aggregates 10,000 feet of long lumber, 15,000 shingles, 10,000 laths, and 4,000 staves. Employment is furnished to 20 hands about the mill plant in addition to numerous employes in the woods during the winter months.

Island Falls Mill Company.

The Island Falls Mill Company operates a sawmill in Island Falls. The daily output is 20,000 feet of long lumber, 13,000 shingles, and about 12,000 laths. About 2,000,000 feet of logs are consumed in a season and employment is given to 30 men. The mill is run by water power and the season of sawing is about six months. The Island Falls Mill Company is not an incorporated company and the members of the partnership are C. S. Perry, James Carson and F. M. Sherman.

Mattawamkeag Lumber Company.

The Mattawamkeag Lumber Company has a modern plant in Island Falls. It stands close to the west branch of the Mattawamkeag river and is operated by steam power, the equipment being three horizontal boilers of 150 horse power each and an engine of over 300 horse power. The mill equipment includes a rotary, surfacer, edger, lath machine, shingle machine, etc. The mill will saw easily upwards of 40,000 feet of long lumber daily and the season's output is about 5,000,000 feet of long lumber, 2,000,000 shingles, and 3,000,000 laths. Employment is given to about 60 hands and the industry is an important one for that section.

The Mattawamkeag Lumber Company also has a plant in the town of Smyrna, near Dudley station. This company is officered as follows: Simeon P. Dean, president; Charles A. Milliken, treasurer; and Carl E. Milliken, clerk and manager.

Elmer E. Milliken.

Elmer E. Milliken operates a sawmill in Bridgewater, the daily output of which is 25,000 shingles, 2,000 pickets, and 15,000 feet of long lumber. The estimated output for the season is 1,500,000 feet of long lumber, and 5,000,000 shingles. Twenty-five hands are employed in the mill, and during the logging season 50 men in the woods.

E. R. Nelson and Company.

E. R. Nelson and Company has, within the limits of Wallagrass plantation, and adjacent to the Fish River division of the Bangor and Aroostook Railroad, a new mill which has a large output of shingles.

Portage Lake Mill Company.

The Portage Lake Mill Company has a plant at Portage station in Portage Lake plantation, consisting of a rotary sawmill with a planer and lath machines, also a shingle mill with three shingle machines, the operating power being furnished by a 250 horse power engine and two boilers. In addition thereto the company has, during the two years since its incorporation,

erected 18 tenement houses, a boarding house accommodating 100 persons, and numerous buildings utilized for storage and other purposes; also a convenient office structure skirting the plant. The entire property is lighted by electricity from a dynamo installed in connection with the power house.

The output of this plant at present is from 35,000 to 40,000 feet of long lumber, 30,000 to 35,000 laths, and 50,000 shingles daily, requiring about 9,000,000 feet of spruce and cedar annually. Employment is furnished to 60 hands a larger part of the year, the company securing considerable timber from their possessions in the immediate vicinity for use during the greater part of the winter season. In addition about 200 hands and 60 horses are employed in the winter in securing an additional timber supply for the following season.

The Portage Lake Mill Company is officered as follows: H. W. Blanchard of Boston, president; Isaac Archibald of North Swansea, Massachusetts, vice president; and Harry B. Sharp of Houlton, treasurer and general manager. The foregoing, with Henry C. Sharp of Monticello and C. L. Pettingall of Island Falls, constitute the board of directors.

Fleetwood Pride.

At St. Croix station, bordering the stream of that name and twenty miles above the junction of the Ashland branch of the Bangor and Aroostook Railroad with the main line, is the plant of Fleetwood Pride. The property includes a rotary sawmill with a shingle mill in connection, the former equipped with planing and lath machines, and the latter with two shingle machines, operating power being derived from a 170 horse power engine and a battery of three boilers. The present daily output is about 35,000 feet of long lumber, 30,000 shingles, and 30,000 laths, this requiring about 7,000,000 feet of spruce, cedar and pine timber, the mill being operated practically the whole year.

Apart from the manufacturing plant there are located about the premises a well equipped repair shop, numerous small structures, an office and general store building, 31 tenement houses, a boarding house accommodating 60 persons, and a school building for the accommodation of children of employes,

with a school teacher assigned thereto. The mill plant is lighted by electricity and amply protected from fire by a powerful steam pump with plenty of hose for any emergency. Employment is furnished to 60 hands about the plant, in addition to which 200 hands and 40 horses are engaged in winter securing the season's supply of logs.

F. C. Robinson's Sons.

F. C. Robinson's Sons operate a lumber mill at Robinson's in the town of Blaine, also one in Portage Lake plantation on the Fish River branch of the Bangor and Aroostook Railroad.

St. John Lumber Company.

The St. John Lumber Company has now in successful operation in Van Buren one of the largest lumber plants in New England. The officers of the company are as follows: President, Hon. Charles A. Milliken, Augusta; treasurer, J. W. Parker, Portland; clerk, Daniel Longfellow, Gardiner; directors, Charles A. Milliken, Augusta; J. W. Parker, Portland; Daniel Longfellow, Gardiner; A. W. Brown, Portland; and Clarence Farrar, Lewiston.

The plant of the St. John Lumber Company, of which A. W. Brown is manager, is located on the St. John river about two and one-half miles above Van Buren village and is connected with the Van Buren division of the Bangor and Aroostook Railroad by a branch railroad which has been extended to the mill. The plant includes a sawmill and a shingle mill, the former being 214 by 60 feet in size and the latter 108 by 54 feet and both are two stories high. The equipment of the sawmill includes two band-saws, and the shingle mill has 10 shingle machines. The equipment of the latter is to be increased by the addition of six more machines later.

The shingle mill was started up in June, 1904, and the saw mill commenced operations about the middle of July following. The shingle mill has a capacity of 1,000,000 shingles per week, and as the mill is expected to run the entire year the annual output will exceed 50,000,000 shingles with its present equipment. During the fall foundations are to be laid for the extension, and

when in another season six additional shingle machines are put in, the total capacity of the sixteen machines will be about 80,000,000 shingles per year.

The sawmill, since starting up, has been sawing from 100,000 to 122,000 feet of long lumber daily and when run on large logs can easily saw 125,000 feet a day. The sawmill is not, for the present, to be run continuously but will probably start up in March and run until early November, the season's output being about 20,000,000 feet of long lumber.

The mill equipment includes also one half dozen or more barkers. The pulp wood that is turned out is shipped to the pulp mill at Howland on the Penobscot river. The mill also has an equipment of lath machines and a considerable quantity of laths will be manufactured yearly.

The power equipment is four horizontal tubular boilers of 250 horse power each, and the big engine for the main mill has a normal horse power of 600, with a maximum of 1,000 horse power. There is also a 200 horse power engine furnishing power for the shingle mill, and a 75 horse power engine for the electric light plant. In and about the mill 175 hands are at present given employment, and during the winter months the securing of 25,000,000 feet of spruce and cedar along the Allagash, St. Francis, Little Black, and the main St. John river, will keep busy a very large number of workmen.

There is a large boom at the mill and also a sorting gap two miles above, about ten piers having been erected at each of these places. In addition to the mill buildings, the company has erected a commodious office, and a boarding house with accommodations for over 100 workmen, and at least a dozen new houses will be built by the company for the accommodation of the employes.

Stadig and Quincy.

In St. Francis plantation, fifteen miles above Fort Kent, and opposite where the waters of the St. Francis stream unite with those of the St. John river, Stadig and Quincy have a new mill where they carry on the manufacture of long lumber and shingles extensively.

Stockholm Lumber Company.

In Stockholm plantation the Stockholm Lumber Company has a steam mill, the season's output of which is about 3,000,000 feet of long lumber, 4,000,000 shingles, and 300,000 laths. Employment is given at the plant to about 35 hands. Carl E. Milliken of Island Falls, with his father, Hon. Charles A. Milliken of Augusta, constitute the Stockholm Lumber Company.

F. W. Titcomb.

F. W. Titcomb, Houlton's veteran lumber manufacturer, has had a unique experience. Since 1873, when he engaged in lumber manufacturing in Houlton, he has lost by fire eight sawmills and is now occupying the ninth. His daily output is from 25,000 to 30,000 feet of long lumber, 25,000 to 30,000 shingles, and 25,000 to 30,000 laths. The entire output in a season is about 4,500,000 feet of long lumber, 8,000,000 shingles and 3,500,000 laths.

Van Buren Lumber Company.

The Van Buren Lumber Company has been an important factor in the development of the upper St. John valley. It is officered as follows: Thomas J. Cochrane, president; John M. Stevens, treasurer; and Allen E. Hammond, general manager. The lumber plant is comprised in some twenty acres about a mile above Van Buren village, upon which, bordering the river, is a modern two story rotary sawmill structure 156 by 40 feet, with an annex loading platform 410 feet in length, paralleled by an extension of the Bangor and Aroostook Railroad, with accommodations for the loading of nineteen cars at one time.

The mill is thoroughly equipped with matchers, surfacers, lath and clapboard machines, with a power plant in connection equipped with three engines aggregating 485 horse power, and a battery of three boilers, this also furnishing operating power for a 350-light dynamo for illuminating purposes. The present output of this plant approximates 100,000 feet of long lumber, 80,000 laths, and from 3,000 to 5,000 clapboards daily, and employment is furnished to about 150 hands.

Apart from the mill property there are scattered about the premises 30 tenement buildings, a boarding house accommodat-

ing 100 workmen, a general headquarters building, and numerous smaller structures utilized for varied purposes.

The company also has a rotary sawmill, with a shingle mill in connection, operated by water power, and located on Violette brook, the output being 10,000 feet of long lumber, and 30,000 shingles daily, this furnishing employment to about 25 hands. In addition to the foregoing is a shingle mill adjacent to the railway station, equipped with twelve machines, operating power being furnished by a 200 horse power engine and boiler. The output of this mill aggregates 180,000 shingles daily, and employment is furnished to 50 hands. Apart from the shingle mill is a storage and loading shed 325 by 40 feet bordering the track, together with a general office structure.

The total cut of timber for both plants for the season is about 25,000,000 feet, this furnishing employment during the winter months to more than 1,000 hands, and 200 horses.

Added to the manufacturing plant is a general merchandise establishment located on Main street and conducted under the title of the Van Buren Mercantile Company.

Weeks Brothers.

In Masardis Weeks Brothers have a sawmill. The daily output is 20,000 feet of long lumber, 20,000 laths, 150,000 shingles, and 3,000 clapboards. The estimated output for the season is 2,000,000 feet of long lumber, and 30,000,000 shingles.

Willey and Briggs.

Willey and Briggs have a sawmill in Westfield plantation. The daily output is 10,000 feet of long lumber, and 13,000 shingles. The estimated output for the season is 700,000 feet of long lumber, and employment is given to 15 hands.

Summary.

The lumber plants enumerated above manufacture, in a season, about 175,000,000 feet of long lumber, and 250,000,000 shingles, employing directly at the mills in the vicinity of 1,500 hands and furnishing employment during the winter months to many thousand men in securing the logs to keep the plants in opera-

tion. When it is understood that the above is only a partial outline of the Aroostook lumber plants and that the output of many small mills are not included therein, the magnitude of Aroostook's lumber industry can, in some degree, be appreciated. Furthermore, many million feet of logs are cut annually on Aroostook's timberlands to be floated down the St. John river and manufactured in New Brunswick.

THE POTATO AS A COMMERCIAL CROP.

HISTORICAL.

The potato, which has become an almost indispensable article of food, was unknown in Europe prior to the discovery of America. It is a native of America, was found by the Spaniards growing wild along the Andes mountains in Chile and Peru in South America and, more or less irregularly, extended into North America, as far north as Colorado. Authorities differ as to whether or not it was cultivated by the Indians before the advent of Europeans. It was taken to Europe, probably to Spain from Peru, early in the sixteenth century.

It is claimed that the potato was first introduced from Virginia into England in 1585 by Sir Walter Raleigh, and in 1586 by Sir Francis Drake, but it seemed for a long time to be regarded more as a curiosity than as an article of food. In 1663 the Royal Society of London recommended it as a possible safeguard against famine among the Irish peasantry, but even in Ireland it was nearly three-quarters of a century later before it was much cultivated.

As late as 1771 there were but two varieties of the potato listed in England, one a white and the other a red variety; and not until the general failure of the grain crop in 1772 did the potato come into popularity there as a food plant.

In America the potato early came into general use and has played an important part in the settlement of the country, particularly in the northern sections, where a bountiful crop was easily and cheaply grown. Along the seaboard and rivers of of our own State, with potatoes in plenty and fish for the catching, the settlers were in no danger from famine.

In 1845 the potato rot very nearly destroyed the whole crop, both in Europe and America. In Ireland, where the potato had become one of the principal articles of food, the loss was most

severely felt, and famine overspread the Island. Although the rot has affected potatoes ever since, the destruction of the crop has never been so nearly complete as in that year. After extensive experiments covering half a century in trying to find a remedy, it is now generally conceded that thorough spraying with the Bordeaux mixture is a very sure preventive of potato rot.

What is now commonly known as the potato bug first came into notice in 1859, in Colorado. It gradually worked its way

DIGGING POTATOES BY MACHINERY.

eastward across the continent, reaching the Atlantic seaboard in 1875. This pest is usually destroyed by spraying with a solution of Paris Green, but in many sections in recent years Bug Death has been substituted, and although the cost of the latter is much greater, it is claimed that Bug Death is less harmful to the foliage, thus securing a larger yield.

The soil and climate of our State are peculiarly adapted to potato raising, in fact Maine stands at the very head of the list

of the states of the Union in the yield per acre and in the quality of tubers grown. While Aroostook county, on account of the extent of her river valleys and the nature of her soil, rich, deep and free from stone, will always be the leading county in potato culture, yet many other sections of the State, smaller in area to be sure, are producing as bountiful crops and of as fine a quality as those grown in Aroostook.

For a long series of years from the settlement of our State, for lack of transportation facilities, potatoes never had any commercial value except on the coast, and even there the demand was small, for there were then no large cities to take our surplus crops, and potatoes were simply grown for home use. But all this has changed. The building of railroads has opened up the remotest corners of our State to the commerce of the world, rendering potatoes a cash crop, and their production has increased to such an extent that they have become the largest and most important commercial crop raised in Maine.

THE POTATO CROP OF THE WORLD.

The normal potato crop of the world is now estimated at about 4,000,000,000 bushels; 3,500,000,000 bushels, or 87.5 per cent, being raised in Europe; 250,000,000 bushels, or 6.25 per cent, in the United States; and 250,000,000 bushels, or 6.25 per cent, in the rest of the world. The normal wheat crop of the world is estimated at 2,700,000,000 bushels; that of corn about the same; rye, 1,600,000,000 bushels; and barley, 1,000,000,000; a total of 8,000,000,000 bushels. This shows the potato crop, when estimated by bushels, equal to one-half the grain crop throughout the world. The bulk of the potato crop in Europe is estimated to be nearly two and one-half times that of the wheat crop; while in the United States the wheat crop is more than double that of potatoes.

POTATOES IN THE UNITED STATES.

The following tables are taken from the Yearbook of the United States Department of Agriculture for 1903.

TABLE I.

ACREAGE, PRODUCTION, VALUE, PRICES, EXPORTS, ETC., OF POTATOES OF THE UNITED STATES, 1866–1903.

Year.	Acreage.	Average yield per acre.	Production.	Average farm price per bushel, December 1.	Farm value, December 1.	Domestic exports, fiscal years beginning July 1.	Imports during fiscal years beginning July 1.
	Acres.	Bush.	Bushels.	Cts.	Dollars.	Bushels.	Bushels.
1866	1,069,381	100.2	107,200,976	47.3	50,722,553	512,380	198,265
1867	1,192,195	82.0	97,783,000	65.9	64,462,486	378,605	209,555
1868	1,131,552	93.8	106,090,000	59.3	62,918,660	508,249	138,470
1869	1,222,250	109.5	133,886,000	42.9	57,481,362	596,968	75,336
1870	1,325,119	86.6	114,775,000	65.0	74,621,019	553,070	458,758
1871	1,220,912	98.7	120,461,700	53.9	64,905,189	621,537	96,259
1872	1,331,331	85.3	113,516,000	53.5	60,692,129	515,306	346,840
1873	1,295,139	81.9	106,089,000	65.2	69,153,709	497,413	549,073
1874	1,310,041	80.9	105,981,000	61.5	65,223,314	609,642	188,757
1875	1,510,041	110.5	166,877,000	34.4	57,357,515	704,379	92,148
1876	1,741,983	71.7	124,827,000	61.9	77,319,541	529,650	3,205,555
1877	1,792,287	94.9	170,092,000	43.7	74,272,500	744,409	528,584
1878	1,776,800	69.9	124,126,650	58.7	72,923,575	625,342	2,624,149
1879	1,336,800	98.9	181,626,400	43.6	79,153,673	696,080	721,868
1880	1,842,510	91.0	167,659,570	48.3	81,062,214	638,840	2,170,372
1881	2,041,670	53.5	109,145,494	91.0	99,291,341	408,286	8,789,860
1882	2,171,636	78.7	170,972,508	55.7	95,304,844	439,443	2,362,362
1883	2,289,275	90.9	208,164,425	42.2	87,849,991	554,613	425,408
1884	2,220,980	85.8	190,642,000	39.6	75,524,290	380,868	658,633
1885	2,265,823	77.2	175,029,000	44.7	78,153,403	494,948	1,937,416
1886	2,287,136	73.5	168,051,000	46.7	78,441,940	434,864	1,432,490
1887	2,357,322	56.9	134,103,000	68.2	91,506,740	403,880	8,259,538
1888	2,533,280	79.9	202,365,000	40.2	81,413,589	471,955	883,380
1889	2,647,989	77.4	204,881,441	35.4	72,610,934	406,618	3,415,578
1890	2,651,579	55.9	148,289,696	75.8	112,341,708	341,189	5,401,912
1891	2,714,770	93.7	254,423,607	35.8	91,012,962	557,022	186,871
1892	2,547,962	61.5	156,654,819	66.1	103,567,520	845,720	4,317,021
1893	2,605,186	70.3	183,034,203	59.4	108,661,801	803,111	3,002,578
1894	2,737,973	62.4	170,787,338	53.6	91,526,787	572,957	1,341,533
1895	2,954,952	100.6	297,237,370	26.6	78,984,901	680,049	175,240
1896	2,767,465	91.1	252,234,540	28.6	72,182,350	926,646	246,178
1897	2,534,577	64.7	164,015,964	54.7	89,643,059	605,187	1,171,378
1898	2,557,729	75.2	192,306,338	41.4	79,574,772	579,833	530,420
1899	2,581,353	88.6	228,783,232	39.0	89,328,882	809,472	155,861
1900	2,611,054	80.8	210,926,897	43.1	90,811,167	741,483	371,911
1901	2,864,335	65.5	187,598,087	76.7	143,979,470	528,484	7,656,162
1902	2,965,587	96.0	284,632,787	47.1	134,111,436	843,075	358,505
1903	2,916,955	84.7	247,127,880	61.4	151,638,094	.....	.....

TABLE II.

ACREAGE, PRODUCTION, AND VALUE OF POTATOES IN THE UNITED STATES IN 1903, BY STATES.

States and Territories.	Acreage.	Average yield per acre.	Production.	Average farm price, December 1.	Farm value, December 1.
	Acres.	Bushels.	Bushels.	Cents.	Dollars.
Maine	87,077	196	17,067,092	56	9,557,572
New Hampshire	18,277	98	1,791,146	65	1,164,245
Vermont	26,590	138	3,669,420	50	1,834,710
Massachusetts	28,874	96	2,771,904	71	1,968,052
Rhode Island	6,764	125	845,500	82	693,310
Connecticut	29,322	96	2,814,912	78	2,195,631
New York	394,870	89	35,143,430	56	19,680,321
New Jersey	57,684	99	5,710,716	69	3,940,394
Pennsylvania	244,153	91	22,217,923	62	13,775,112
Delaware	6,180	84	519,120	56	290,707
Maryland	28,513	70	1,995,910	60	1,197,546
Virginia	49,520	84	4,159,680	64	2,662,195
North Carolina	24,641	67	1,650,947	74	1,221,701
South Carolina	8,555	81	692,955	104	720,673
Georgia	8,628	73	629,844	94	592,053
Florida	3,489	82	286,098	126	360,483
Alabama	9,643	67	646,081	96	620,238
Mississippi	5,635	82	462,070	88	406,622
Louisiana	8,140	50	407,000	91	370,370
Texas	26,437	67	1,771,279	88	1,558,726
Arkansas	23,073	70	1,615,110	79	1,275,937
Tennessee	25,085	66	1,655,610	64	1,059,590
West Virginia	31,226	80	2,498,080	66	1,648,733
Kentucky	36,165	73	2,640,045	68	1,795,231
Ohio	161,947	83	13,441,601	61	8,199,377
Michigan	268,230	78	20,921,940	49	10,251,751
Indiana	77,888	76	5,919,488	66	3,906,862
Illinois	143,369	72	10,322,568	72	7,432,249
Wisconsin	252,522	58	14,646,276	58	8,494,840
Minnesota	140,015	64	8,960,960	61	5,466,186
Iowa	162,741	56	9,113,496	75	6,835,122
Missouri	86,977	66	5,740,482	76	4,362,766
Kansas	72,143	58	4,184,294	85	3,556,650
Nebraska	80,599	64	5,158,336	65	3,352,918
South Dakota	32,437	89	2,886,893	54	1,558,922
North Dakota	24,200	84	2,032,800	48	975,744
Montana	12,904	176	2,271,104	44	999,286
Wyoming	3,665	167	612,055	57	348,871
Colorado	50,758	145	7,359,910	60	4,415,946
New Mexico	1,297	87	112,839	84	94,785
Utah	11,776	177	2,084,352	47	979,645
Nevada	2,522	117	295,074	70	206,552
Idaho	11,672	160	1,867,520	46	859,059
Washington	29,411	145	4,264,595	36	1,535,254
Oregon	35,367	107	3,784,269	50	1,892,134
California	46,536	130	6,049,680	66	3,992,789
Oklahoma	10,227	78	797,706	98	781,752
Indian Territory	9,111	70	637,770	86	548,482
United States	2,916,855	84.7	247,127,880	61.4	151,638,994

TABLE III.

AVERAGE YIELD PER ACRE OF POTATOES IN THE UNITED STATES, 1894-1903, BY STATES.

States and Territories.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.
Maine	147	163	165	59	130	139	126	150	130	196
New Hampshire	120	134	108	51	90	127	101	108	120	98
Vermont	124	154	128	70	105	132	134	90	94	138
Massachusetts	105	133	108	62	97	134	79	77	109	96
Rhode Island	133	138	105	110	123	142	94	98	164	125
Connecticut	79	128	106	54	100	130	96	81	92	96
New York	77	122	89	62	73	88	81	78	66	89
New Jersey	60	94	94	68	75	83	69	59	132	99
Pennsylvania	64	111	109	63	54	85	58	62	83	91
Delaware	50	58	78	60	49	52	48	55	79	84
Maryland	52	87	90	74	58	64	55	60	80	70
Virginia	59	73	93	61	68	66	58	71	75	84
North Carolina	62	79	79	66	67	57	61	64	64	67
South Carolina	59	90	52	65	65	56	78	70	69	81
Georgia	52	58	55	52	54	46	68	64	58	73
Florida	90	55	75	75	64	69	60	62	90	82
Alabama	43	70	64	55	74	56	69	67	50	67
Mississippi	72	58	70	59	74	61	66	62	69	82
Louisiana	45	89	55	64	78	60	70	60	65	50
Texas	80	89	52	60	78	64	62	54	66	67
Arkansas	82	70	59	55	74	63	72	46	72	70
Tennessee	55	64	62	40	52	44	54	46	62	66
West Virginia	52	69	93	56	62	72	80	52	96	80
Kentucky	54	86	85	47	64	51	70	35	80	73
Ohio	65	63	89	42	61	71	76	54	94	83
Michigan	62	101	88	72	79	66	97	81	72	78
Indiana	59	66	85	31	71	76	83	31	101	76
Illinois	50	77	97	38	70	96	92	35	118	72
Wisconsin	45	107	78	99	98	103	103	75	115	58
Minnesota	39	158	84	106	85	96	81	68	98	64
Iowa	43	106	94	60	80	100	72	32	98	56
Missouri	69	109	78	42	66	82	93	17	128	66
Kansas	41	72	69	48	70	95	72	26	138	58
Nebraska	22	67	90	69	65	94	66	33	137	64
South Dakota	23	66	96	94	72	78	73	45	74	89
North Dakota	84	128	102	99	87	103	52	110	105	84
Montana	111	53	170	156	104	141	134	157	153	176
Wyoming	150	100	167	150	120	125	99	113	100	167
Colorado	85	95	88	97	77	84	56	120	100	145
New Mexico	75	80	72	90	58	49	19	50	72	87
Utah	135	172	155	148	135	120	118	114	157	177
Nevada	161	150	190	135	155	102	156	141	212	117
Idaho	178	105	162	140	120	124	136	108	149	160
Washington	125	149	125	162	108	144	116	117	136	145
Oregon	112	64	87	160	86	115	110	90	103	107
California	52	75	80	105	95	119	104	101	118	130
Oklahoma	.....	.....	.....	.....	.....	.....	.....	55	97	78
Indian Territory	.....	.....	.....	.....	.....	.....	.....	63	85	70
General average	62.4	100.6	91.1	64.7	75.2	88.6	80.8	65.5	96.0	84.7

TABLE IV.

AVERAGE VALUE PER ACRE OF POTATOES IN THE UNITED STATES BASED UPON FARM VALUE DECEMBER 1, 1894-1903, BY STATES.

States and Territories.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
Maine	$64 68	$55 42	$62 70	$52 51	$59 80	$58 38	$61 74	$100 50	$84 50	$109 76
New Hampshire	56 40	42 88	50 76	45 90	44 40	58 42	53 53	85 32	82 80	63 70
Vermont	54 56	40 04	37 12	49 00	44 10	47 52	53 60	57 60	54 52	69 00
Massachusetts	68 25	63 84	61 56	55 80	61 11	76 38	52 14	69 30	88 29	68 16
Rhode Island	95 76	62 10	56 70	106 70	78 72	71 00	65 80	91 14	123 00	102 50
Connecticut	53 72	52 48	48 76	48 60	55 00	59 80	67 20	76 14	67 16	74 88
New York	36 96	28 06	27 59	41 54	30 66	35 20	36 45	55 38	38 94	49 84
New Jersey	37 20	31 96	33 84	53 04	45 75	42 33	41 40	50 15	80 52	68 31
Pennsylvania	36 48	31 08	29 43	41 58	31 32	36 55	30 74	47 12	47 31	56 42
Delaware	25 00	22 04	27 30	39 00	33 81	26 52	28 80	42 90	40 29	47 04
Maryland	27 56	26 10	27 00	50 32	30 74	32 64	29 70	46 20	41 60	42 00
Virginia	33 04	27 74	31 62	42 70	37 40	36 96	34 22	52 54	43 50	53 76
North Carolina	37 20	43 45	33 97	42 24	41 54	37 62	39 65	46 08	42 88	49 58
South Carolina	45 43	65 70	34 32	68 25	65 00	58 24	78 00	77 00	66 24	84 24
Georgia	42 12	41 18	41 25	52 00	40 50	38 18	52 36	67 84	52 20	68 62
Florida	67 50	55 00	63 00	90 00	76 80	85 56	63 60	79 98	109 80	103 32
Alabama	37 84	56 70	48 00	51 70	61 42	48 72	56 58	73 03	46 50	64 32
Mississippi	59 04	37 12	43 40	48 38	53 28	62 22	54 78	71 30	63 48	72 16
Louisiana	37 35	64 08	41 80	54 40	58 50	48 60	55 30	60 60	53 30	45 50
Texas	79 20	69 42	40 56	57 00	67 08	58 24	54 56	67 50	56 10	58 96
Arkansas	43 46	35 70	31 27	46 20	40 70	44 73	41 04	57 96	48 96	55 30
Tennessee	26 95	25 60	24 80	29 20	29 64	28 60	31 32	39 56	39 68	42 24
West Virginia	29 64	28 98	28 83	36 40	33 48	37 44	40 80	44 20	48 96	52 80
Kentucky	30 24	33 54	28 05	31 49	29 44	31 11	35 00	30 45	42 40	49 64
Ohio	32 76	20 16	24 14	26 04	25 01	30 53	30 40	45 90	41 36	50 63
Michigan	26 66	16 16	16 72	30 96	21 33	21 12	25 22	55 08	29 52	38 22
Indiana	31 86	20 46	21 25	19 22	29 11	32 68	31 54	27 90	41 41	50 16
Illinois	32 00	23 10	25 22	23 56	32 20	39 36	37 72	32 55	49 56	51 84
Wisconsin	23 85	18 19	14 82	37 62	23 52	26 78	28 84	50 25	37 95	33 64
Minnesota	19 89	22 12	17 64	32 86	21 25	24 00	24 30	45 56	30 38	39 04
Iowa	29 67	20 14	20 68	28 20	24 00	23 00	26 64	30 08	33 32	42 00
Missouri	35 88	27 25	24 18	26 46	29 04	33 20	32 55	18 02	44 80	50 16
Kansas	27 88	30 24	18 63	26 40	35 70	42 75	34 56	27 04	62 10	49 30
Nebraska	16 94	20 10	22 50	31 74	24 05	23 50	32 34	34 65	36 99	41 60
South Dakota	17 02	17 16	19 20	30 08	20 16	21 06	26 28	38 25	32 56	48 06
North Dakota	38 64	21 76	21 42	32 67	29 58	27 81	25 48	53 90	34 65	40 32
Montana	53 28	25 44	54 40	62 40	57 20	74 73	71 02	114 61	76 50	77 44
Wyoming	90 00	56 00	71 81	82 50	78 00	76 25	67 32	112 40	65 27	95 19
Colorado	46 75	31 35	41 36	54 32	41 58	46 20	45 92	108 00	51 00	87 00
New Mexico	60 00	50 40	48 96	70 20	45 24	33 32	21 66	59 00	58 32	73 08
Utah	40 50	58 48	49 60	44 40	41 85	66 00	56 64	68 40	70 65	83 19
Nevada	56 35	57 00	72 20	98 55	139 50	91 80	87 36	128 31	133 56	81 90
Idaho	94 34	42 00	48 60	44 80	64 80	75 64	63 92	90 72	55 13	73 60
Washington	35 00	41 72	50 00	45 36	42 14	72 00	54 52	71 37	51 68	52 20
Oregon	40 32	24 96	33 93	64 00	40 42	56 35	49 50	63 00	56 65	53 50
California	25 48	36 00	42 40	51 45	52 25	74 97	55 12	77 77	68 44	85 80
Oklahoma								69 30	74 69	76 44
Indian Territory								78 12	54 40	60 20
General average	$33 43	$26 73	$26 08	$35 37	$31 11	$34 60	$24 78	$50 27	$45 22	$51 99

TABLE V.

AVERAGE FARM PRICE OF POTATOES PER BUSHEL IN THE UNITED STATES DECEMBER 1, 1894-1903, BY STATES.

States and Territories.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
Maine	44	34	38	89	46	42	49	67	65	56
New Hampshire	47	32	47	90	49	46	53	79	69	65
Vermont	44	26	29	70	42	36	40	64	58	50
Massachusetts	65	48	57	90	63	57	66	90	81	71
Rhode Island	72	45	54	97	64	56	70	93	75	82
Connecticut	68	41	46	90	55	46	70	94	73	78
New York	48	23	31	67	42	40	45	71	59	56
New Jersey	62	34	36	78	61	51	60	85	61	69
Pennsylvania	57	28	27	66	58	43	53	76	57	62
Delaware	50	38	35	65	69	51	60	78	51	56
Maryland	53	30	30	68	53	51	54	77	52	60
Virginia	56	38	34	70	55	56	59	74	58	64
North Carolina	60	55	43	64	62	66	65	72	67	74
South Carolina	77	73	66	105	100	104	100	110	96	104
Georgia	81	71	75	100	75	83	77	106	90	94
Florida	75	100	84	120	120	124	106	129	122	126
Alabama	88	81	75	94	83	87	82	109	93	96
Mississippi	82	64	62	82	72	102	83	115	92	88
Louisiana	83	72	76	85	75	81	79	101	82	91
Texas	99	78	78	95	86	91	88	125	85	88
Arkansas	53	51	53	84	55	71	57	126	68	79
Tennessee	49	40	40	73	57	65	58	86	64	64
West Virginia	57	42	31	65	54	52	51	85	51	66
Kentucky	56	39	33	67	46	61	50	87	53	68
Ohio	52	32	26	62	41	43	40	85	44	61
Michigan	43	16	19	43	27	32	26	68	41	49
Indiana	54	31	25	62	41	43	38	90	41	66
Illinois	64	30	26	62	46	41	41	93	42	72
Wisconsin	53	17	19	38	24	26	28	67	33	58
Minnesota	51	14	21	31	25	25	30	67	31	61
Iowa	69	19	22	47	30	23	37	94	34	75
Missouri	52	25	31	63	44	40	35	106	35	76
Kansas	68	42	27	55	51	45	48	104	45	85
Nebraska	77	30	25	46	37	25	49	105	27	65
South Dakota	74	26	20	32	28	27	36	85	44	54
North Dakota	46	17	21	33	34	27	49	49	33	48
Montana	48	48	32	40	55	53	53	73	50	44
Wyoming	60	56	43	55	65	61	68	100	61	57
Colorado	55	33	47	56	54	55	82	90	51	60
New Mexico	80	63	68	78	78	68	114	118	81	84
Utah	30	34	32	30	31	55	48	60	45	47
Nevada	35	38	38	73	90	90	56	91	63	70
Idaho	53	40	30	32	54	61	47	84	37	46
Washington	28	28	40	28	39	50	47	61	38	36
Oregon	36	39	39	40	47	49	45	70	55	50
California	49	48	53	49	55	63	53	77	58	66
Oklahoma	.....	.....	.....	.....	.....	.....	.....	126	77	98
Indian Territory	.....	.....	.....	.....	.....	.....	.....	124	64	86
General average	53.6	26.6	28.6	54.7	41.4	39.0	43.1	76.7	47.1	61.4

The foregoing tables have been introduced in order to give a general idea of the potato industry of the whole country and to form a basis for comparisons with the industry in Maine.

Table I shows the acreage, average yield per acre, total production, farm values per bushel on December 1, total farm values, exports and imports of potatoes in the United States for each year from 1886 to 1903 inclusive.

It will be noted that at the begining of the period named the total acreage barely exceeded one million acres. The increase has been generally steady with but small fluctuations, reaching the two million mark in 1881, and in very recent years has nearly reached three million acres.

The average yield per acre has shown great fluctuations from year to year, falling as low as 53.5 bushels per acre in 1881, and reaching as high as 110.5 bushels in 1875. But four times during the period named has the average yield reached 100 bushels per acre. The average for the 38 years was 82.1 bushels.

The total product has varied, in round numbers, from 97 million bushels in 1867, to 297 million bushels in 1895. The increase has been far from uniform. Notwithstanding the rapid increase in acreage from year to year, the product of 1875 exceeded that of 1890, 1892 or 1897.

The lowest average farm price per bushel on December 1, 26.6 cents, was reached in 1895, the year of the largest product and, with two exceptions, the largest yield per acre; the highest average farm price per bushel, 91 cents in 1881, when the average yield per acre was lowest, 53.5 bushels.

The increase in the total farm value of the crop during the period named, with few exceptions, has been quite uniform, the high prices in years of small crops and the low prices in years of plenty tending to this result, the most notable exception being the very large increase in the last three years.

In regard to exports of potatoes, the fluctuations from year to year have been small and the increase very gradual, the average during the first five years of the period being about 500,000 bushels and for the last five years an average of 800,000 bushels. But imports have varied greatly, ranging from 75,000 bushels in 1869, to over 8,000,000 bushels in 1881 and 1887.

Table II shows the acreage, average yield per acre, production in bushels, average farm price December 1, and total farm values, by states and territories, of the potato crop of the United States in 1903.

The largest acreage, 394,870 acres, was in New York, and the smallest, 1,297 acres, in New Mexico. The acreage in Maine was 87,077. Eight states, New York, Pennsylvania,

Ohio, Michigan, Illinois, Wisconsin, Minnesota and Iowa had a greater acreage than Maine.

In the average yield per acre Maine heads the list with 196 bushels. Utah with 177 bushels, and Montana with 176 bushels come nearest the Maine yield. Although the Maine yield was 196 bushels per acre there were but 12 states out of the 48 states and territories which showed a yield as high as 100 bushels per acre. The average for the whole country was 87.7 bushels.

Maine produced 17,067,092 bushels of potatoes in 1903, and although eight states largely exceeded Maine in acreage, only three, New York, Pennsylvania and Michigan exceeded our State in production. More potatoes were raised in Maine in 1903 than in the eleven states which formed the Southern Confederacy.

Coming to the average farm price per bushel on December 1, we find Maine stands at a disadvantage, being 56 cents against an average for the whole country of 61.4 cents. Only nine states showed a lower price than Maine, prices running particularly low in the sparsely settled Rocky Mountain and Pacific states where the yield is large. Prices run highest in the Southern states where comparatively few potatoes are raised.

Three states only, New York, Pennsylvania and Michigan, exceeded Maine in total farm value of the potato crop.

Table III shows the average yield per acre, by states and territories, from 1894 to 1903 inclusive. A glance at the table will show that New England and the Rocky Mountain and Pacific states are the sections producing the highest yield per acre. Maine averaged 140.5 bushels per acre for the ten years, while the average for the whole country was 80.9 bushels. Nevada with an average of 151.9 bushels, and Utah with an average of 143.1 bushels are the only states exceeding Maine in average yield per acre for the ten years. The lowest average, 54.5 bushels, was in Tennessee. In only one year, 1897, did Maine fall below the average for the whole country, but in 1894, 1901 and 1903 the average yield per acre in Maine was more than double that of the United States.

Table IV shows the average farm value per acre on December 1 by states and territories from 1894 to 1903 inclusive. Nevada with an average of $94.64, Rhode Island with $85.34,

Wyoming with $79.47, and Florida with $79.46 are the only states which show an average farm value of the crop per acre for the ten years larger than Maine, the average for Maine being $71.00 per acre for the ten years against an average of $36.95 in the whole country for the same time.

Table V shows the average farm price per bushel on December 1 by states and territories, from 1894 to 1903 inclusive. The average for Maine for the ten years was 53 cents against 47.2 cents for the whole country. The great potato growing states in the middle West run lowest, Minnesota averaging 35.6 cents; North Dakota, 35.8 cents; Wisconsin, 36.3 cents, and Michigan, 36.4 cents. The sections of high priced potatoes are in the South and Southwest, Florida averaging for the ten years, $1.10 per bushel; South Carolina, 93.5 cents per bushel; Georgia, 85.2 cents, and New Mexico, 83.2 cents. The average price is lower in Vermont than in Maine but higher in all other New England states.

The acreage and farm value of potatoes in the United States are now about three times what they were 38 years ago. As a rule this country raises potatoes sufficient for home consumption for all purposes. Counting the years from 1866 to 1902 inclusive, eighteen years show an excess of exports, and seventeen years an excess of imports. On account of large imports in several years of scarcity the gross imports for the 37 years amounted to 64,684,224 bushels, while the exports amounted to only 21,561,583 bushels, a surplus of imports of 43,122,641 bushels, or an annual average surplus of 1,165,477 bushels.

Of the potato crop of 1903 practically one-half was raised in the six states of New York, Pennsylvania, Michigan, Maine, Wisconsin and Ohio.

MAINE AS A POTATO GROWING STATE.

Of the early potato crops in Maine we have no very definite records. In 1820 the State attempted to ascertain the volume and value of her farm products by sending blanks for returns to the officers of the several municipalities, but potatoes seemed to be of too little commercial value to be included in the schedules. Greenleaf, in his Survey of Maine, estimates that in 1820 three-fourths of the tillage land of the State was devoted to

corn, wheat and other grains, while one-fourth was devoted to "horticulture, and the field culture of potatoes and other roots for the food of man and beast, (which includes a considerable proportion of the tillage of all farmers, and of some a large part) flax, and other articles."

The first definite figures we have of Maine potatoes were of the crop raised in 1839, which amounted to 10,392,280 bushels. The following June the number of swine in the State, six months old and upwards, to which this immense crop of potatoes was largely fed, was 117,386, a number which has never since been approximated. On account of the large areas of new land being cleared, field crops were generally larger in those days than they have been since 1850. The Maine yield of potatoes in 1839, only a few years prior to the advent of the potato rot, was never equaled, so far as available records show, until 1902. In 1849 the crop had fallen to 3,436,040 bushels.

With the exception of the years 1889 to 1892 inclusive, and also 1901, for which no figures are obtainable, we here give the estimates of the United States Department of Agriculture of the potato crop of Maine from 1867 to 1903 inclusive, including acreage, number of bushels raised, and farm value of the crop on December 1.

Crop of 1867, 40,450 acres, producing 3,503,000 bushels, valued at $3,257,790.

Crop of 1868, 42,307 acres, producing 5,500,000 bushels, valued at $4,290,000.

Crop of 1869, 58,593 acres, producing 7,500,000 bushels, valued at $3,900,000.

Crop of 1870, 52,216 acres, producing 6,527,000 bushels, valued at $4,307,820.

Crop of 1871, 51,478 acres, producing 7,310,000 bushels, valued at $3,362,600.

Crop of 1872, 48,733 acres, producing 3,655,000 bushels, valued at $2,485,400.

Crop of 1873, 25,615 acres, producing 2,997,000 bushels, valued at $1,558,440.

Crop of 1874, 37,398 acres, producing 4,600,000 bushels, valued at $2,484,000.

Crop of 1875, 54,299 acres, producing 5,810,000 bushels, valued at $2,440,200.

Crop of 1876, 58,680 acres, producing 5,868,000 bushels, valued at $3,696,840.

Crop of 1877, 70,000 acres, producing 7,000,000 bushels, valued at $3,320,000.

Crop of 1878, 51,800 acres, producing 3,833,200 bushels, valued at $2,798,236.

Crop of 1879, 51,800 acres, producing 6,993,000 bushels, valued at $2,937,060.

Crop of 1880, 48,170 acres, producing 5,154,190 bushels, valued at $2,474,011.

Crop of 1881, 64,274 acres, producing 3,342,248 bushels, valued at $2,573,531.

Crop of 1882, 66,845 acres, producing 6,684,496 bushels, valued at $5,013,372.

Crop of 1883, 70,856 acres, producing 8,219,296 bushels, valued at $3,945,262.

Crop of 1884, 60,228 acres, producing 5,842,000 bushels, valued at $2,687,320.

Crop of 1885, 62,035 acres, producing 6,204,000 bushels, valued at $2,605,470.

Crop of 1886, 62,035 acres, producing 6,514,000 bushels, valued at $3,582,700.

Crop of 1887, 68,239 acres, producing 4,436,000 bushels, valued at $3,060,840.

Crop of 1888, 71,651 acres, producing 7,882,000 bushels, valued at $3,625,541.

Crop of 1893, 51,905 acres, producing 6,228,600 bushels, valued at $3,363,444.

Crop of 1894, 58,134 acres, producing 8,545,698 bushels, valued at $3,760,107.

Crop of 1895, 62,203 acres, producing 10,139,089 bushels, valued at $3,447,290.

Crop of 1896, 49,140 acres, producing 8,108,100 bushels, valued at $3,081,100.

Crop of 1897, 41,769 acres, producing 2,464,371 bushels, valued at $2,193,290.

Crop of 1898, 45,946 acres, producing 5,972,980 bushels, valued at $2,747,571.

Crop of 1899, 46,865 acres, producing 6,514,235 bushels, valued at $2,735,979.

Crop of 1900, 49,208 acres, producing 6,200,208 bushels, valued at $3,038,102.

Crop of 1902, 80,627 acres, producing 10,481,510 bushels, valued at $6,812,982.

Crop of 1903, 87,077 acres, producing 17,067,092 bushels, valued at $9,557,572.

These government estimates, necessarily, can never be exact, yet they are approximately so, and as far as comparisons with census figures are concerned the estimates are invariably below the census figures. They are always used in government calculations, and are practically as valuable in showing the general increase or decrease of production as though the count was made exact.

The above figures cover two periods in the potato industry of Maine; first, from 1867 to 1888 inclusive, when very much the greater part of the crop was consumed in the State, largely fed to swine and other farm stock; and second, from 1893 to 1903 inclusive, when shipments have been largely on the increase until nearly half the crop is exported. The interesting point in comparing the two periods is the average increase in production. In the first period the annual crop of the State averaged, in round numbers, 5,700,000 bushels, and in the second period, 8,200,000 bushels, an increase of 2,500,000 bushels. The large increase in acreage in very recent years is mainly due to the opening up of new potato territory by the extensions of railroads in Aroostook and Washington counties.

THE MAINE POTATO CROP OF 1899, BY COUNTIES.

The following table is taken from the United States Census Report of 1900 so far as relates to the acreage and number of bushels of potatoes raised. We have added the average number of bushels per acre and the number of bushels per capita raised in each of the several counties and for the entire State. The figures given are for the crop raised in 1899.

THE POTATO CROP IN MAINE IN 1899.

Counties.	Acreage.	Number of Bushels Raised.		
		Total.	Per acre.	Per capita.
Androscoggin	1,724	203,470	118	3.8
Aroostook	41,953	6,466,189	154	106.4
Cumberland	2,726	302,980	111	3.0
Franklin	1,190	140,908	118	7.6
Hancock	1,293	144,011	111	3.9
Kennebec	2,791	282,468	101	4.8
Knox	864	93,151	108	3.1
Lincoln	1,206	114,000	95	5.8
Oxford	2,423	295,256	122	9.2
Penobscot	4,346	513,326	118	6.7
Piscataquis	1,057	132,219	125	7.8
Sagadahoc	766	72,199	94	3.6
Somerset	2,376	265,712	112	7.8
Waldo	2,067	247,151	120	10.2
Washington	1,563	206,184	132	4.6
York	3,420	334,524	98	5.2
The State	71,765	9,813,748	137	14.1

The above table is the only record at hand of the potato crop of Maine by counties in recent years, and a study of the figures is interesting. The total acreage for the State in 1899 was 71,765 acres; for Aroostook county, 41,953 acres, or 58.5 per cent of the whole; for the other fifteen counties of the State, 29,812 acres, or 41.5 per cent of the whole. The total yield for the State was 9,813,748 bushels; for Aroostook county, 6,466,189 bushels, or 65.9 per cent of the whole; for the other fifteen counties of the State, 3,347,559 bushels, or 34.1 per cent of the whole. The average yield per acre in the State was 137 bushels; for Aroostook county, 154 bushels; for the other fifteen counties of the State, 112 bushels.

As a rule the yield per acre was highest in the northern and eastern counties and lowest in the coast counties, although there were a few exceptions to this general rule. The counties showing the highest yield per acre, at or above the average yield for the fifteen counties outside of Aroostook, were Aroostook, 154 bushels; Washington, 132; Piscataquis, 125; Oxford, 122; Waldo, 120; Androscoggin, Franklin and Penobscot, 118 each; Somerset, 122. The counties falling below the average were Cumberland and Hancock, 111 bushels each; Knox, 108; Kennebec, 101; York, 98; Lincoln, 95; Sagadahoc, 94.

The yield per capita in 1899 in Maine was 14.1 bushels; in Aroostook county, 106.4 bushels; in the other fifteen counties

of the State, 5.3 bushels. The yield per capita in the whole country for the same year was 3 bushels.

Of the Aroostook county potato crop of 6,466,189 bushels in 1899, there were shipped over the Bangor and Aroostook Railroad 2,894,672 bushels, or 44¾ per cent of the amount raised, but no figures are at hand showing the amount shipped from that county over the Canadian Pacific Railway.

THE CROP OF 1903.

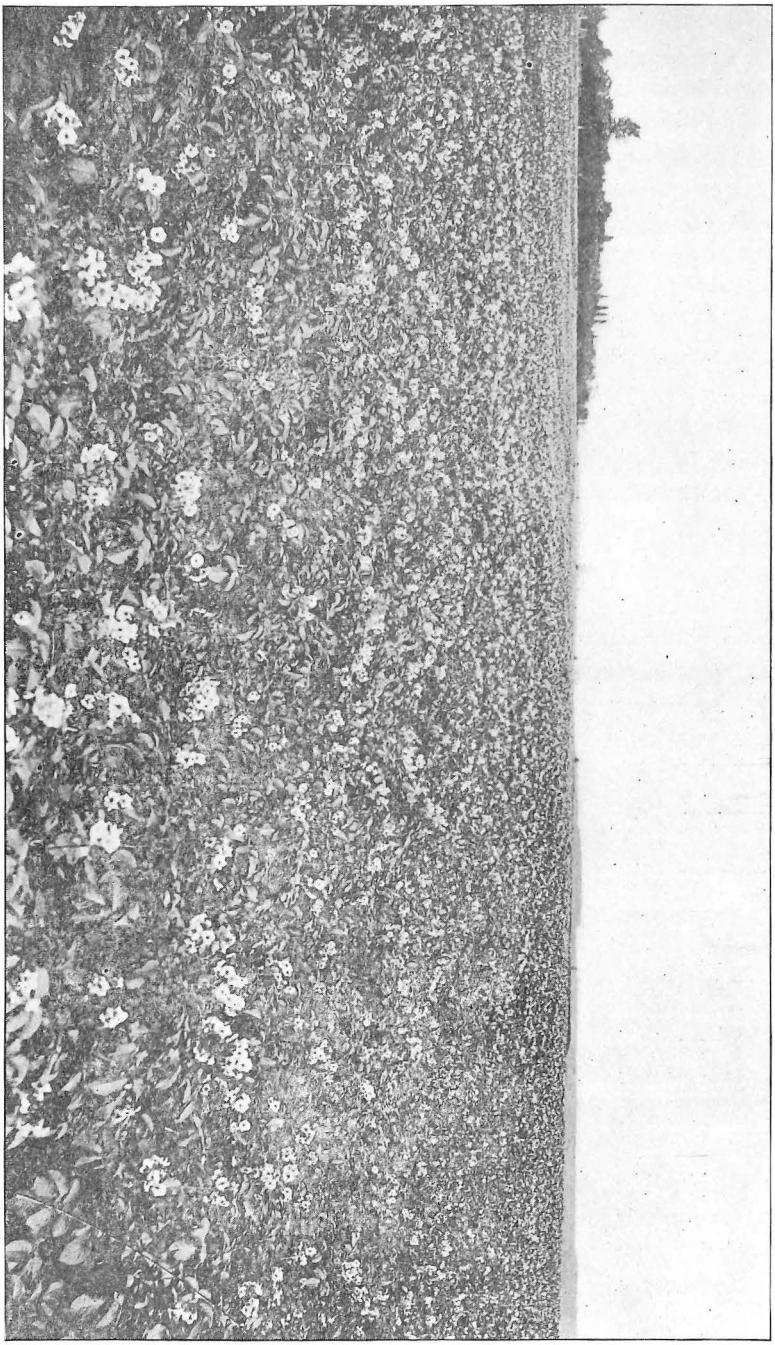
From 1899 to 1903 the potato crop of Maine increased from 9,813,748 bushels to 17,067,092 bushels, or 73.9 per cent; while in the whole country the increase was from 228,783,232 bushels to 247,127,880 bushels, or .8 of one per cent.

During the same time the yield per capita in Maine increased from 14.1 bushels, or 846 pounds, to 24.3 bushels, or 1,458 pounds, a gain of 10.2 bushels, or 612 pounds; while the yield in the whole country per capita increased from 3 bushels, or 180 pounds, to a small fraction over 3 bushels, or 184 pounds, a gain of 4 pounds.

From the best information we can obtain we find that 7,300,000 bushels of the crop of 1903 were shipped by rail, and 1,600,000 bushels were made into starch. Allowing 3 bushels per individual there were 2,100,000 bushels consumed as food on the tables of the 700,000 inhabitants of the State, and about 800,000 bushels were required for seed for the Maine crop of 1904. This foots up 11,800,000 bushels, leaving 5,200,000 bushels to be fed to farm animals.

POTATO HOUSES.

The shipping season of a crop of potatoes is from digging time in early fall, until near the last of June the following year. Many potatoes are hauled direct from the field to the shipping points along the line of railroad, as the farmers are not provided with storage room for their crops. In order to care for these accumulated stocks of potatoes at the railroad stations, immense storage buildings, or potato houses, as they are called, have to be erected and provided with artificial heat to protect the tubers from frost while awaiting shipment. Most of these storage buildings are located in Aroostook county, although



AN AROOSTOOK POTATO FIELD IN BLOSSOM.

there are five in Patten and one in Winn, in Penobscot county, one in Dennysville, in Washington county, and perhaps others in other places. Whenever potatoes are shipped in large quantities potato houses become a necessity.

There is no uniform rule in the construction of these houses. They vary in width from 20 to 70 feet, though the range of most of them is from 30 to 40 feet; and the length varies from 30 to 440 feet. The floor dimensions do not, however, indicate very clearly the capacity of a potato house, as some are built low and some high posted.

We here present a list of potato storage houses along the line of the Bangor and Aroostook Railroad in the county of Aroostook, including those in Patten, giving names of owners, dimensions of buildings, and an approximate estimate of storage capacity in bushels as they exist at the present time. They are given by stations arranged alphabetically.

Ashland.

G. E. Reed has one house 24 by 125 feet, with a capacity of 13,750 bushels.

The Robinson Company, one house 30 by 80 feet, capacity 5,500 bushels.

J. C. Seely, one house 43 by 46 feet, capacity 5,500 bushels.

Total capacity for Ashland, 24,750 bushels.

Bridgewater.

Bradstreet and Pryor, one house 30 by 70 feet, capacity 8,000 bushels.

Bradstreet and Pryor, and White and Pryor, one house 30 by 65 feet, capacity 7,000 bushels.

J. W. Sargent, one house 30 by 60 feet, capacity 8,000 bushels.

A. M. Stackpole, one house 30 by 40 feet, capacity 4,000 bushels.

Stackpole and Hartley, two houses, one 26 by 50 feet, with 5,000 bushels capacity, and the other 25 by 70 feet, with 9,500 bushels capacity, a total capacity of 14,500 bushels.

Total capacity for Bridgewater; 41,500 bushels.

Caribou.

The Bowker Fertilizer Company, Irving and Ricker, agents, one house 40 by 105 feet, capacity 27,500 bushels.

Chapin Brothers, one house 30 by 60 feet, capacity 7,500 bushels.

Collins, Spaulding and Ullrich, one house 40 by 100 feet, capacity 16,000 bushels.

H. A. Edwards and Company, one house 40 by 100 feet, capacity 16,000 bushels.

C. B. Foster, one house 40 by 50 feet, capacity 7,500 bushels.

Goud and King, one house 35 by 35 feet, capacity 9,000 bushels.

H. W. and E. A. Keirstead, one house 30 by 40 feet, capacity 5,000 bushels.

M. J. McCarthy, one house 35 by 100 feet, capacity 13,500 bushels.

Pitcher, White and Company, one house 35 by 55 feet, capacity 9,000 bushels.

F. Putnam and Company, one house 40 by 55 feet, capacity 9,000 bushels.

Shaw and Thomas, one house 40 by 60 feet, capacity 10,000 bushels.

Jeremiah Smith, one house 40 by 102 feet, capacity 18,000 bushels.

The Standard Fertilizer Company, one house 30 by 60 feet, capacity 8,000 bushels.

D. L. Teague, one house 40 by 55 feet, capacity 9,000 bushels.

H. P. Todd, one house 34 by 60 feet, capacity 9,500 bushels.

S. L. White, two houses, one 35 by 40 feet, with 5,500 bushels capacity, and the other 35 by 60 feet, with 9,500 bushels capacity, a total capacity of 15,000 bushels.

S. D. Woodruff and Sons, one house 40 by 70 feet, capacity 9,500 bushels.

Total capacity for Caribou, 199,000 bushels.

Crystal.

Truman B. Bradford, two houses, one 32 by 70 feet, with 4,400 bushels capacity, and the other 40 by 100 feet, with 33,332 bushels capacity, a total capacity of 37,732 bushels.

A. P. Dearborne, one house 20 by 30 feet, capacity 1,650 bushels.

Total capacity for Crystal, 39,382 bushels.

Eagle Lake.

Frank Martin, one house, size and capacity not ascertained.

Easton.

Bartlett and Robinson, one house 24 by 32 feet, capacity 2,750 bushels.

The E. L. Cleveland Company, two houses, one 40 by 60 feet, with 15,000 bushels capacity, and the other 34 by 50 feet, with 10,000 bushels capacity, a total capacity of 25,000 bushels.

G. M. Colbroth, one house 35 by 137 feet, capacity 32,750 bushels.

C. N. DeLaite, one house 24 by 32 feet, capacity 3,500 bushels.

T. M. Hoyt, one house 35 by 130 feet, capacity 30,000 bushels.

S. J. Huson, one house 40 by 40 feet, capacity 10,000 bushels.

Andrew Ladner, one house 34 by 40 feet, capacity 8,000 bushels.

Eugene Thompson, one house 34 by 50 feet, capacity 10,000 bushels.

Towle and Dilling, one house 34 by 60 feet, capacity 11,000 bushels.

W. J. Weymouth, one house 35 by 90 feet, capacity 27,000 bushels.

Total capacity for Easton, 160,000 bushels.

Fairmount.

Ezra Emery Munce, one house 40 by 75 feet, capacity 25,000 bushels.

Clarence A. Powers, one house 38 by 100 feet, capacity 20,000 bushels.

Charles M. Towle, one house 40 by 100 feet, capacity 20,000 bushels.

Total capacity for Fairmount, 65,000 bushels.

Fort Fairfield.

The J. V. Bayless Seed Company, two houses, one 30 by 40 feet, with 4,400 bushels capacity, and the other 40 by 50 feet, with 8,000 bushels capacity, a total capacity of 12,400 bushels.

Chapin Brothers, one house 36 by 40 feet, capacity 6,900 bushels.

A. Foss, one house 30 by 40 feet, capacity 4,400 bushels.

F. P. Grant, one house 36 by 40 feet, capacity 6,900 bushels.

The Hacker Estate, one house 40 by 60 feet, capacity 10,000 bushels.

W. Kinney, one house 36 by 40 feet, capacity 6,900 bushels.

Newsom and Company, one house 40 by 50 feet, capacity 8,000 bushels.

Osborne Brothers, one house 36 by 40 feet, capacity 6,900 bushels.

Total capacity for Fort Fairfield, 62,400 bushels.

Fort Fairfield Junction.

C. L. Whittaker, one house 25 by 47 feet, capacity 5,500 bushels.

Whittaker and Gilman, one house 32 by 32 feet, capacity 3,300 bushels.

Total capacity for Fort Fairfield Junction, 8,800 bushels.

Fort Kent.

David Castonguay, one house 35 by 60 feet, capacity 14,000 bushels.

A. B. Daigle, one house 30 by 50 feet, capacity 8,250 bushels.

Levi Ramsey, one house 30 by 50 feet, capacity 8,250 bushels.

Ramsey and Reed, one house 35 by 60 feet, capacity 14,000 bushels.

Total capacity for Fort Kent, 44,500 bushels.

Goodrich.

The J. V. Bayless Seed Company, one house 40 by 60 feet, capacity 11,000 bushels.

The Bowker Fertilizer Company, rented by W. B. Ward and Company, one house 40 by 60 feet, capacity 9,225 bushels.

L. M. Goodrich, one house 32 by 70 feet, capacity 11,000 bushels.

D. W. Haines, one house 42 by 60 feet, capacity 11,000 bushels.

George H. Klippel, one house 38 by 72 feet, capacity 8,250 bushels.

M. A. Knights, one house 36 by 40 feet, capacity 4,950 bushels.

W. H. Poole, one house 42 by 100 feet, capacity 16,500 bushels.

Total capacity for Goodrich, 71,925 bushels.

Grimes Mill.

Mrs. Ada Doyle, one house 40 by 60 feet, capacity 10,000 bushels.

D. W. Haines, one house 32 by 90 feet, capacity 10,000 bushels.

George W. Hale, one house 40 by 60 feet, capacity 10,000 bushels.

Total capacity for Grimes Mill, 30,000 bushels.

Houlton.

C. A. Atherton, one house 36 by 56 feet, capacity 9,625 bushels.

David M. Bamford, one house 40 by 40 feet, capacity 7,150 bushels.

George H. Benn, one house 30 by 60 feet, capacity 20,000 bushels.

T. H. Blake and Brother, one house 36 by 46 feet, capacity 10,450 bushels.

Frank P. Clark, one house 40 by 79 feet, capacity 19,250 bushels.

Clark Brothers, one house 40 by 73 feet, capacity 11,000 bushels.

The E. L. Cleveland Company, four houses, one 30 by 46 feet, with 7,500 bushels capacity, one 30 by 46 feet, with 7,000 bushels capacity, one 28 by 80 feet, with 9,750 bushels capacity, and the other 28 by 80 feet, with 10,000 bushels capacity, a total capacity of 34,250 bushels.

W. R. Dresser, one house 30 by 65 feet, capacity 12,375 bushels.

H. Edblad, one house 36 by 46 feet, capacity 13,750 bushels.

The National Fertilizer Company, one house 50 by 100 feet, capacity 27,500 bushels.

J. S. Peabody, one house 29 by 40 feet, capacity 5,500 bushels.

A. H. Porter, two houses, one 36 by 52 feet, with 8,250 bushels capacity, and the other 30 by 50 feet, with 8,250 bushels capacity, a total capacity of 16,500 bushels.

E. B. Porter, one house 30 by 50 feet, capacity 9,625 bushels.

Ira Porter, David M. Bamford, lessee, one house 30 by 60 feet, capacity 9,625 bushels.

B. F. Shattuck and H. A. Porter, one house 30 by 50 feet, capacity 8,250 bushels.

W. R. Whitney, three houses, two of the same dimensions and capacity, 36 by 46 feet, and 5,950 bushels, and the other 20 by 40 feet, with 2,750 bushels capacity, a total capacity of 14,650 bushels.

Total capacity for Houlton, 229,500 bushels.

Island Falls.

W. H. Cole and Company, two houses, one 28 by 30 feet, with 7,000 bushels capacity, and the other 40 by 80 feet, with 20,000 bushels capacity, a total capacity of 27,000 bushels.

F. L. Longstaff, one house 40 by 80 feet, capacity 18,000 bushels.

S. C. Spratt, one house 40 by 60 feet, capacity 10,000 bushels.

Vail and Robinson, one house 36 by 60 feet, capacity 12,000 bushels.

Total capacity for Island Falls, 67,000 bushels.

Jemtland.

L. P. Larsson, one house 34 by 36 feet, capacity 19,000 bushels.

L. P. Larsson and E. O. Hedman, one house 40 by 100 feet, capacity 5,500 bushels.

Total capacity for Jemtland, 24,500 bushels.

Limestone.

H. A. Chase, one house 40 by 60 feet, capacity 11,000 bushels.

Clark Brothers, one house 40 by 70 feet, capacity 19,000 bushels.

W. R. Dresser, one house 40 by 70 feet, capacity 22,000 bushels.

C. F. Durepo, one house 40 by 40 feet, capacity 8,250 bushels.

D. A. Foster, one house 40 by 60 feet, capacity 10,000 bushels.

R. B. Leavitt, two houses, one 32 by 42 feet, with 6,700 bushels capacity, and the other 40 by 70 feet, with 13,700 bushels capacity, a total capacity of 20,400 bushels.

George S. Osborne, one house 40 by 70 feet, capacity 13,700 bushels.

C. A. Perry, one house 40 by 70 feet, capacity 13,700 bushels.

Walter Phair, one house 36 by 40 feet, capacity 6,000 bushels.

W. B. Ward and Company, three houses, one 40 by 70 feet, with 13,700 bushels capacity, one 40 by 70 feet, with 17,000 bushels capacity, and the other 40 by 70 feet, with 16,500 bushels capacity, a total capacity of 47,200 bushels.

Total capacity for Limestone, 171,250 bushels.

Littleton.

C. M. Dobson, one house 26 by 36 feet, capacity 3,300 bushels.

J. A. Linton, one house 25 by 57 feet, capacity 8,250 bushels.

J. D. Ross, one house 30 by 35 feet, capacity 3,500 bushels.

A. H. Weeks and Company, one house 28 by 30 feet, capacity 3,300 bushels.

William Whitney, one house 30 by 84 feet, capacity 13,700 bushels.

Total capacity for Littleton, 32,050 bushels.

Ludlow.

G. D. Williamson, one house 34 by 66 feet, capacity 3,000 bushels.

Maple Grove.

George L. Foss, R. C. Hoyt, agent, one house 38 by 60 feet, capacity 8,250 bushels.

C. A. Powers, one house 45 by 85 feet, capacity 27,500 bushels.

Total capacity for Maple Grove, 35,750 bushels.

Mars Hill.

J. W. Adams, one house 70 by 75 feet, capacity 11,000 bushels.

C. N. Allen, one house 32 by 36 feet, capacity 1,800 bushels.

Chase and Nelson, one house 35 by 40 feet, capacity 7,000 bushels.

The E. L. Cleveland Company, J. D. Robinson, Safford and York, Hersom and York, one house 40 by 440 feet, capacity 125,000 bushels.

Samuel Currie, R. J. Colbroth, Gilbert Graham, Pitcher, White and Company, one house 40 by 380 feet, capacity 86,850 bushels.

R. M. Fox, one house 30 by 50 feet, capacity 2,500 bushels.

Total capacity for Mars Hill, 234,150 bushels.

Masardis.

J. W. Carney, one house 30 by 60 feet, capacity 8,500 bushels.

H. A. Willard, one house 40 by 40 feet, capacity 6,500 bushels.

Total capacity for Masardis, 15,000 bushels.

Monticello.

Guy C. Fletcher, one house 30 by 70 feet, capacity 11,000 bushels.

H. L. Good, one house 30 by 60 feet, capacity 8,250 bushels.

D. J. Grass, one house 36 by 60 feet, capacity 11,000 bushels.

M. E. Hill, one house 30 by 115 feet, capacity 13,750 bushels.

Lowrey and Foster, one house 30 by 50 feet, capacity 5,500 bushels.

W. L. Nye, one house 30 by 60 feet, capacity 8,250 bushels.

B. E. Ramsey, one house 36 by 45 feet, capacity 7,700 bushels.

H. C. Sharp, one house 30 by 50 feet, capacity 7,700 bushels.

C. C. Traviss, one house 30 by 45 feet, capacity 5,500 bushels.

Lowell Van Allen, one house 36 by 50 feet, capacity 8,250 bushels.

Van Allen and Good, one house 30 by 50 feet, capacity 6,875 bushels.

John R. Weed, Jr., one house 36 by 50 feet, capacity 11,000 bushels.

Total capacity for Monticello, 104,775 bushels.

New Limerick.

The E. L. Cleveland Company, one house 40 by 60 feet, capacity 5,000 bushels.

C. W. Hatfield, one house 32 by 40 feet, capacity 3,000 bushels.

Locke and Hurd, one house 32 by 40 feet, capacity 3,000 bushels.

J. J. Mackey, one house 40 by 80 feet, capacity 6,000 bushels.

Total capacity for New Limerick, 17,000 bushels.

New Sweden.

George P. Clark, two houses, one 35 by 40 feet, with 4,000 bushels capacity, and the other 35 by 60 feet, with 5,500 bushels capacity, a total capacity of 9,500 bushels.

C. A. Jacobson, one house 40 by 50 feet, capacity 5,500 bushels.

A. Pearson, one house 35 by 40 feet, capacity 5,000 bushels.

A. H. Tornquist, one house 35 by 50 feet, capacity 5,000 bushels.

Ullrich Brothers, one house 35 by 40 feet, capacity 5,000 bushels.

Total capacity for New Sweden, 30,000 bushels.

Oakfield.

Chapin Brothers, one house 34 by 60 feet, capacity 11,000 bushels.

The E. L. Cleveland Company, one house 40 by 60 feet, capacity 13,750 bushels.

W. G. Hersey, one house 30 by 36 feet, capacity 5,000 bushels.

C. S. Lougee, one house 30 by 60 feet, capacity 9,625 bushels.

Martin and Shorey, one house 35 by 60 feet, capacity 14,000 bushels.

Samuel White, one house 34 by 44 feet, capacity, 6,000 bushels.

Total capacity for Oakfield, 59,375 bushels.

Patten.

I. B. Gardner and Sons, two houses, one 40 by 60 feet, with 6,875 bushels capacity, and the other 40 by 68 feet, with 5,425 bushels capacity, a total capacity of 12,300 bushels.

E. J. Parker, one house 40 by 56 feet, capacity 14,000 bushels.

Quincy, Cooper and Rowe, two houses, one 40 by 60 feet, with 10,000 bushels capacity, and the other 40 by 135 feet, with 20,000 bushels capacity, a total capacity of 30,000 bushels.

Total capacity for Patten, 56,300 bushels.

Portage.

N. B. Sutherland, one house 34 by 50 feet, capacity 7,500 bushels.

Presque Isle.

Fred Barker, one house 35 by 50 feet, capacity 9,500 bushels.

Lewis S. Bean, one house 40 by 50 feet, capacity 11,500 bushels.

Carter and Corey, three houses, one 35 by 172 feet, with 45,000 bushels capacity, one 35 by 50 feet, with 9,500 bushels capacity, and the other 40 by 100 feet, with 25,000 bushels capacity, a total capacity of 79,500 bushels.

E. S. Cary, one house 40 by 50 feet, capacity 14,000 bushels.

E. Graves, one house 35 by 40 feet, capacity 7,500 bushels.

Milton Hicks, one house 40 by 50 feet, capacity 10,500 bushels.

Hone Brothers, one house 40 by 130 feet, capacity 30,000 bushels.

E. E. Parkhurst, one house 40 by 50 feet, capacity 10,500 bushels.

T. H. Phair, one house 35 by 100 feet, capacity 15,000 bushels.

The Robinson Company, three houses, one 40 by 176 feet, with 47,000 bushels capacity, one 40 by 50 feet, with 11,500 bushels capacity, and the other 35 by 40 feet, with 8,000 bushels capacity, a total capacity of 66,500 bushels.

A. M. Smith, one house 35 by 60 feet, capacity 7,500 bushels.

M. C. Smith, one house 30 by 40 feet, capacity 3,000 bushels.

John Stephens, one house 40 by 60 feet, capacity 15,000 bushels.

G. B. Whidden, three houses, one 32 by 50 feet, with 8,000 bushels capacity, one 32 by 70 feet, with 15,000 bushels capacity, and the other 40 by 60 feet, with 15,000 bushels capacity, a total capacity of 38,000 bushels.

Total capacity for Presque Isle, 318,000 bushels.

Robinson's.

J. Gilman, one house 32 by 40 feet, capacity 4,600 bushels.

T. G. Huntington, one house 32 by 69 feet, capacity 8,500 bushels.

Safford and York, one house 32 by 40 feet, capacity 4,600 bushels.

Total capacity for Robinson's, 17,700 bushels.

Sherman.

W. S. Blake, two houses, one 30 by 50 feet with 6,000 bushels capacity, and the other 30 by 50 feet with 3,000 bushels capacity, a total capacity of 9,000 bushels.

Albert Butterfield, one house 30 by 50 feet, capacity 6,000 bushels.

Jerry Cummings, one house 30 by 50 feet, capacity 9,000 bushels.

H. A. Farmer, one house 25 by 30 feet, capacity 5,000 bushels.

F. J. McAvey, two houses, one 30 by 55 feet, with 11,700 bushels capacity, and the other 25 by 30 feet, with 5,300 bushels capacity, a total capacity of 17,000 bushels.

Total capacity for Sherman, 46,000 bushels.

Smyrna Mills.

C. A. Atherton, one house 35 by 68 feet, capacity 13,750 bushels.

L. R. Drew, one house 40 by 60 feet, capacity 19,255 bushels.

A. M. Leavitt, one house 32 by 70 feet, capacity 11,000 bushels.

W. H. and A. Roach, one house 34 by 46 feet, capacity 9,000 bushels.

Wiseman and Gilman, one house 36 by 50 feet, capacity 14,500 bushels.

Total capacity for Smyrna Mills, 67,505 bushels.

Stockholm.

John Anderson, one house 40 by 40 feet, capacity 6,000 bushels.

Van Buren.

R. W. Dresser, one house 35 by 50 feet, capacity 5,000 bushels.

Allen E. Hammond, one house 35 by 160 feet, capacity 20,000 bushels.

Joseph Martin and Son, one house 35 by 50 feet, capacity 5,000 bushels.

J. F. Theriault, one house 35 by 50 feet, capacity 5,000 bushels.

Total capacity for Van Buren, 35,000 bushels.

The above foots up 201 houses, with an aggregate capacity of 2,326,612 bushels. In addition to the potato houses located along the lines of the Bangor and Aroostook Railroad, there are in the neighborhood of 30 such houses on the branches of the Canadian Pacific Railway in Aroostook county, the capacity of which we have not obtained.

It will be seen that the capacity of the houses enumerated will accommodate considerably less than one-half the potatoes

shipped. While many potatoes are loaded on the cars direct from teams, and large quantities are stored in farm cellars, other accommodations have to be provided and many of the farmers have constructed large storage buildings at their homes, in which to care for their crops until such time as they can be taken by the railroads. Such storage buildings are found not only in Aroostook but are extending into other counties as well.

THE SHIPMENT OF MAINE POTATOES.

The shipment of potatoes from Maine antedates the advent of railroads. A century ago, limited quantities were carried from our coast towns in small sailing vessels, and at times a considerable trade was carried on with the South Atlantic States, vessels taking out potatoes and returning loaded with corn. As railroads pushed further into the State and regular lines of steamboats were established between Boston and Maine ports, the trade gradually increased, but no very large quantities were shipped except in years of scarcity in other potato growing states.

Greenleaf gives some meager accounts of shipments of Maine potatoes in 1826. That year Portland exported 4,316 bushels, valued at $1,871, or at the rate of 43 cents per bushel. The same year both Bath and Belfast shipped some potatoes but the amounts were undoubtedly small, as they were lumped with other articles. A part of those sent from Belfast went to Eastport.

The old line of steamboats on the Penobscot river, running between Old Town and Mattawamkeag prior to the building of the European and North American Railway, did a considerable business some years in shipping potatoes from the upper Penobscot section, and when the above mentioned railroad was opened, shipments increased from that region.

It was not until the building of branch railroads from New Brunswick into Houlton, Fort Fairfield, Presque Isle and Caribou, in the early seventies, that the shipment of potatoes from Aroostook county was commenced. We have no record of the amounts shipped over the Canadian roads, except for the crop of 1903, which amounted to 900,000 bushels.

The real boom, however, in Maine potatoes, did not fairly open until the building of the Bangor and Aroostook Railroad, which reached Houlton late in 1893, and has been extended so that it now fairly covers the potato growing sections of that county. The facilities for shipment have greatly stimulated their cultivation so that now fully two-thirds of the potatoes raised in Maine are grown in Aroostook county.

The Bangor and Aroostook Railroad covers Aroostook and Piscataquis counties and a few stations in Penobscot. The potato shipments over this road, principally from Aroostook county, from 1894 to 1903 inclusive, were as follows:

1894	1,496,929 bushels.
1895	1,586,267 bushels.
1896	2,371,847 bushels.
1897	1,291,175 bushels.
1898	2,567,808 bushels.
1899	2,894,672 bushels.
1900	3,043,879 bushels.
1901	4,471,183 bushels.
1902	3,112,466 bushels.
1903	5,604,666 bushels.

We have no data from other railroads in the State relating to the shipment of potatoes in the years prior to 1903.

SHIPMENTS OF THE CROP OF 1903.

The shipments of the potato crop of 1903 originating on the Bangor and Aroostook Railroad, according to the sworn statement of the officials of that road, amounted to 168,140 tons, or 5,604,666 bushels, allowing 60 pounds to the bushel, which is the legal weight. Shipments of 20,972 tons, or 699,066 bushels, originated on the Maine Central Railroad, 900,000 bushels on the Canadian Pacific Railway, and 56,700 bushels on the Washington County Railroad, while about 40,000 bushels originated on other roads of the State, enough to bring the total shipments from the whole State up to 7,300,000 bushels, or 42.7 per cent of the 17,067,092 bushels raised in Maine that year. Of the amount shipped by rail, 76.8 per cent originated on the Bangor and Aroostook Railroad, 9.6 per cent on the Maine Cen-

tral, 12.3 per cent on the Canadian Pacific, and 1.3 per cent on other roads in the State.

For the purpose of showing the amount of potatoes shipped from the various counties of the State, as well as to get at the particular localities where potatoes are being raised in commercial quantities, blanks were sent to all railroad stations outside of Aroostook county, calling for the number of bushels shipped to points outside of the State, also number of bushels shipped to points within the State.

Returns were received from the larger part of the station agents, many of them showing that no potatoes had been shipped, but so many neglected to send the information called for that the totals, as given in the tables, do not show the full amount of shipments in either of the fifteen counties, but the returns are tabulated for the purpose of indicating, in a general way, the different sections of the State where potatoes are grown for shipment. For total shipments we have used the figures furnished by the officials of the several railroads, as given above.

No blanks were sent into Aroostook county for the reason that we have the figures of the Bangor and Aroostook Railroad and the Canadian Pacific Railway, which practically cover that county. No division is made of Aroostook potatoes between those shipped to points within or without the State but it is a well known fact that the great bulk of potatoes from the county goes outside of Maine.

SHIPMENTS FROM AROOSTOOK COUNTY, CROP OF 1903.

Aroostook being by far the most important county in the export of potatoes, shipping nearly five-sixths of the amount sent out of Maine, and having the returns complete as to number of carloads sent from each station over the Bangor and Aroostook Railroad and the amount in bulk sent over the Canadian Pacific Railway, we have made the tabulation of shipments from this county separate from that of the other counties of the State where the returns are incomplete.

The information in regard to the shipments was obtained from the general freight agents of the Bangor and Aroostook Railroad and Atlantic Division of the Canadian Pacific Railway and is thoroughly reliable. We have computed the approximate num-

ber of bushels sent from each station on the basis of 550 bushels to a carload. This, of course, is not absolutely correct, as there is more or less variation in the capacity of potato cars, but on the whole cannot be far out of the way.

From Ashland, 145 cars were shipped, approximating 79,750 bushels.

From Bridgewater, 209 cars were shipped, approximating 114,950 bushels.

From Caribou, 1,280 cars were shipped, approximating 704,000 bushels.

From Crystal, 89 cars were shipped, approximating 48,950 bushels.

From Eagle Lake, 4 cars were shipped, approximating 2,200 bushels.

From Easton, 219 cars were shipped, approximating 285,450 bushels.

From Fairmount, 263 cars were shipped, approximating 144,650 bushels.

From Fort Fairfield, 455 cars were shipped, approximating 250,250 bushels.

From Fort Fairfield Junction, 133 cars were shipped, approximating 73,150 bushels.

From Fort Kent, 72 cars were shipped, approximating 39,600 bushels.

From Goodrich, 364 cars were shipped, approximating 200,200 bushels.

From Grimes Mill, 126 cars were shipped, approximating 69,300 bushels.

From Houlton, 1,032 cars were shipped, approximating 567,600 bushels.

From Island Falls, 96 cars were shipped, approximating 52,800 bushels.

From Jemtland, 55 cars were shipped, approximating 30,250 bushels.

From Limestone, 432 cars were shipped, approximating 237,600 bushels.

From Littleton, 124 cars were shipped, approximating 68,200 bushels.

From Ludlow, 97 cars were shipped, approximating 53,350 bushels.

From Maple Grove, 279 cars were shipped, approximating 153,450 bushels.

From Mars Hill and Blaine, 654 cars were shipped, approximating 359,700 bushels.

From Masardis, 38 cars were shipped, approximating 20,900 bushels.

From Monticello, 377 cars were shipped, approximating 207,350 bushels.

From New Limerick, 232 cars were shipped, approximating 127,600 bushels.

From New Sweden, 227 cars were shipped, approximating 124,800 bushels.

From Oakfield, 167 cars were shipped, approximating 91,850 bushels.

From Portage, 16 cars were shipped, approximating 8,800 bushels.

From Presque Isle, 1,315 cars were shipped, approximating 723,250 bushels.

From Robinson's, 120 cars were shipped, approximating 66,000 bushels.

From Sherman, 222 cars were shipped, approximating 122,100 bushels.

From Smyrna Mills, 122 cars were shipped, approximating 67,100 bushels.

From Stockholm, 6 cars were shipped, approximating 3,300 bushels.

From Van Buren, 133 cars were shipped, approximating, 73,150 bushels.

From Wallagrass, 2 cars were shipped, approximating 1,100 bushels.

From Wiley Road, 111 cars were shipped, approximating 61,050 bushels.

The total shipments from the county over the Bangor and Aroostook Railroad, as above computed, foots up 9,516 carloads, or 5,233,800 bushels. To this should be added 900,000 bushels shipped over the Canadian Pacific Railway from the four stations of Caribou, Presque Isle, Fort Fairfield and Houlton, making a grand total of 6,133,800 bushels exported from Aroostook county, of the crop of 1903.

SHIPMENTS FROM THE STATE OUTSIDE OF AROOSTOOK, CROP OF 1903.

The following tabulation of returns received from station agents along the lines of the several railroads in the fifteen counties outside of Aroostook, foots up 598,945 bushels, and covers a little more than one-half of the potatoes shipped by rail from those counties, the total being, according to the returns of the several railroad companies, 1,166,200 bushels.

Returns by Station Agents of Potatoes Shipped of Crop of 1903.

ANDROSCOGGIN COUNTY.

Stations.	Number of bushels shipped.		
	To points out of the State.	To points within the State.	Total.
Curtis' Corner	118	29	147
Danville Junction	.....	120	120
East Livermore	50	27	77
Leeds Center	.....	38	38
Leeds Junction	20	80	100
Lisbon	75	25	100
Livermore Falls	80	12	92
North Leeds	94	122	216
Poland	100	100	200
West Minot	.....	150	150
	537	703	1,240

CUMBERLAND COUNTY.

Brunswick	2,100	300	2,400
East North Yarmouth	100	.....	100
Freeport	.....	2,995	2,995
Gorham	25	50	75
Gray	.....	50	50
Harrison	.....	150	150
Hillside	88	23	111
New Gloucester	500	5,000	5,500
Pownal	200	1,800	2,000
Scarboro Beach	.....	15	15
Steep Falls	.....	197	197
Walnut Hill	40	14	54
West Baldwin	.....	250	250
Westbrook	50	.....	50
Yarmouth	.....	800	800
Yarmouth Junction	22	9	31
	3,125	11,653	14,778

FRANKLIN COUNTY.

Chisholm	.....	1,000	1,000
East Wilton	.....	50	50
Farmington	1,286	743	2,029
Madrid	.....	300	300
North Jay	223	.....	223
Strong	.....	500	500
West Farmington	72	1,001	1,073
Wilton	75	75	150
	1,656	3,669	5,325

HANCOCK COUNTY.

Stations.	Number of Bushels Shipped.		
	To points out of the State.	To points within the State.	Total.
Bucksport	2,618	150	2,768
Bucksport Center	700	.....	700
Ellsworth	239	180	419
Ellsworth Falls	5	74	79
Franklin	31	21	52
Hancock	517	274	791
Washington Junction	12	8	20
	4,122	707	4,829
KENNEBEC COUNTY.			
Albion	300	200	500
Belgrade	2,300	200	2,500
Clinton	.....	150	150
Monmouth	95	580	675
North Belgrade	.....	100	100
North Vassalboro	.....	4	4
Oakland	560	40	600
Readfield	328	14	342
South China	33	10	43
Vassalboro	3,050	105	3,155
Weeks' Mills	300	100	400
Windsor	6	.....	6
Winslow	.....	50	50
	6,972	1,553	8,525
KNOX COUNTY.			
Warren	50	.....	50
	50	.....	50
LINCOLN COUNTY.			
Cooper's Mills	13	3	16
Damariscotta Mills	100	500	600
Muscongus Bay	54	53	107
Nobleboro	.....	600	600
Sheepscot	30	.....	30
South Newcastle	707	212	919
Westport	.....	500	500
Whitefield	13	50	63
Winslow's Mills	.....	800	800
	917	2,718	3,635
OXFORD COUNTY.			
Bethel	4,800	200	5,000
Bryant's Pond	.....	500	500
Brownfield	800	3,000	3,800
Buckfield	.....	2,500	2,500
Canton	.....	486	486
Dixfield	35	71	106
East Peru	.....	58	58
East Sumner	100	920	1,020
Fryeburg	20,000	4,000	24,000
Gilead	105	108	213
Hiram	10	134	144
Locke's Mills	2,000	66	2,066
Oxford	.....	100	100
Rumford Falls	75	200	275
South Paris	800	400	1,200
West Bethel	.....	500	500
West Paris	189	521	710
	28,914	13,764	42,678

PENOBSCOT COUNTY.

Stations.	Number of Bushels Shipped.		
	To points out of the State.	To points within the State.	Total.
Alton	32	393	425
Bangor	11,589	1,686	13,275
Brewer Junction	.....	10	10
Carmel	4,570	322	4,892
Corinna	38,510	6,510	45,020
Costigan	.....	20	20
Dexter	15,190	.....	15,190
East Newport	14,788	5,658	20,446
Enfield	500	200	700
Etna	9,408	173	9,581
Hermon Pond	12,177	72	12,249
Hermon Center	506	506	1,012
Holden	2,000	400	2,400
Kingman	32,500	.....	32,500
Lagrange	4,225	1,633	5,858
Lincoln	3,000	.....	3,000
Lincoln Center	10,819	156	10,975
Newport Junction	875	632	1,507
Olamon	27	63	90
Orono	1,905	19	1,924
Orrington	30	.....	30
Passadumkeag	23	326	349
Patten	68,200	.....	68,200
South Lagrange	2,904	607	3,511
Winn	15,023	1,323	16,346
Wytopitlock	3,850	.....	3,850
	252,651	20,709	273,36

PISCATAQUIS COUNTY.

Abbot	6,000	.....	6,000
Abbot Village	2,900	1,000	3,900
Blanchard	5	785	790
Boyd Lake	.....	80	80
Brownville Junction	428	.....	428
Dover and Foxcroft	5,000	.....	5,000
East Dover	500	3,385	3,885
Greenville	330	250	580
Guilford	4,500	250	4,750
Milo Junction	.....	160	160
Shirley	1,000	1,200	2,200
South Sebec	900	400	1,300
	21,563	7,510	29,073

SAGADAHOC COUNTY.

Richmond	3,000	865	3,865
Topsham	14	16	30
Woolwich	3	.....	3
	3,017	881	3,898

SOMERSET COUNTY.

Stations.	Number of Bushels Shipped. To points out of the State.	To points within the State.	Total.
Bingham	50	450	500
Detroit	1,800	500	2,300
Norridgewock	2,135	825	2,960
North Anson	3,150	100	3,250
Pishon's Ferry	1,500	500	2,000
Pittsfield	1,700	600	2,300
Skowhegan	3,000	550	3,550
Solon	1,200	300	1,500
Strickland's Ferry	1,072	155	1,227
	15,607	3,980	19,587

WALDO COUNTY.

Belfast	750	.....	750
Burnham Junction	.....	306	306
City Point	35	150	185
Knox	7,100	.....	7,100
Palermo	200	300	500
Thorndike	14,975	18,393	33,368
Unity	30,000	10,000	40,000
	53,060	29,149	82,209

WASHINGTON COUNTY.

Baring	1,800	.....	1,800
Cherryfield	1,500	.....	1,500
Columbia	1,000	.....	1,000
Columbia Falls	154	25	179
Danforth	43,557	.....	43,557
Dennysville	10,400	2,500	12,900
Eastport	675	.....	675
Eaton	1,000	.....	1,000
Forest	1,516	142	1,658
Harrington	1,239	59	1,298
Jonesboro	47	19	66
Machias	5,151	242	5,393
Pembroke	11,000	.....	11,000
Perry	24,407	.....	24,407
Princeton	900	225	1,125
Unionville	8	4	12
Vanceboro	.....	150	150
Whitneyville	18	8	26
	104,372	3,374	107,746

YORK COUNTY.

Alfred	140	13	153
Buxton Center	132	252	384
Cornish	.....	216	216
East Waterboro	50	200	250
Eliot	42	.....	42
Kennebunk	20	.....	20
North Berwick	400	.....	400
South Berwick	22	.....	22
Springvale	90	10	100
Wells' Beach	400	.....	400
West Kennebunk	.....	25	25
	1,296	716	2,012

RECAPITULATION.

Counties.	Number of Bushels Shipped.		
	To points out of the State.	To points within the State.	Total.
Androscoggin	537	703	1,240
Cumberland	3,125	11,653	14,778
Franklin	1,656	3,669	5,325
Hancock	4,122	707	4,829
Kennebec	6,972	1,553	8,525
Knox	50	.....	50
Lincoln	917	2,718	3,635
Oxford	28,914	13,764	42,678
Penobscot	252,651	20,709	273,360
Piscataquis	21,563	7,510	29,073
Sagadahoc	3,017	881	3,898
Somerset	15,607	3,980	19,587
Waldo	53,060	29,149	82,209
Washington	104,372	3,374	107,746
York	1,296	716	2,012
	497,859	101,086	598,945

By reference to the table it will be seen that in the extreme northern part of Washington county there were shipped from the various stations along the line of the Maine Central Railroad nearly 50,000 bushels, Danforth being the principal shipping point; while in the southeastern part of the county, from the stations in Dennysville, Pembroke and Perry there were shipped as many more.

From the northeastern section of Penobscot county along the line of the Maine Central from Wytopitlock station to Lincoln, about 70,000 bushels were shipped, while from the southwestern section of the county, including the stations in Corinth, Carmel, Dexter, Etna, Hermon and Newport, considerably over 100,000 bushels were shipped. Bangor shipped about 13,000 bushels, and Patten about 68,000 bushels.

From the northern part of Waldo county there were shipped from the stations of Unity, Thorndike, Knox and Brooks about 100,000 bushels.

The larger part of the potatoes from Piscataquis county were from the stations in Abbot, Guilford and Shirley, from which nearly 17,000 bushels were sent out, although about 9,000 bushels were shipped from the Dover and Foxcroft and East Dover stations.

The shipments from Somerset county were about 5,000 bushels from Detroit and Pittsfield, and 15,000 bushels from the Kennebec river towns, nearly evenly divided among the towns of Bingham, Solon, Anson, Norridgewock, Skowhegan and Fairfield.

Oxford county shipped over 40,000 bushels, 24,000 bushels from Fryeburg, while Bethel, Brownfield, Buckfield and Greenwood contributed from 3,000 to 5,000 bushels each.

In the remaining nine counties in the State there seems to be no section where any several contiguous towns are shipping many potatoes, but here and there a town shipped a few thousand bushels, among which may be mentioned Richmond in Sagadahoc county, Farmington in Franklin county, New Gloucester, Freeport and Brunswick in Cumberland county, Bucksport in Hancock county, Vassalboro and Belgrade in Kennebec county.

THE CROP OF 1904.

From reports received from various sections of the State it is evident that the acreage of potatoes in 1904 exceeded that of 1903. The preliminary report of the United States Department of Agriculture estimates the Maine yield at 215 bushels per acre, against 110.4 bushels for the whole country. The above estimates would place the 1904 yield in Maine at about 19,000,000 bushels. Prices are considerably lower than in 1903, but the crop is finding a ready sale at a figure that insures a fair margin of profit to the producer.

FUTURE OF THE MAINE POTATO.

Within a few years there has been developed considerable interest in raising potatoes on a large scale outside of Aroostook county. Reports have come to this office of increased acreage from Penobscot, Piscataquis, Somerset, Kennebec, Washington and Sagadahoc counties, where potato machinery is being purchased, better shipping facilities provided, and starch factories projected.

In Winn in Penobscot county, and in Dennysville in Washington county, potato houses have been erected during 1904, and no doubt others will follow at other points in several of the eastern counties.

In the town of Richmond in Sagadahoc county, the Johnson Seed Potato Company is raising large quantities of seed potatoes which find a ready market in various parts of the country. The present year, 1904, there were planted on the several farms owned by this company, 62 acres of potatoes, from which a yield of about 17,000 bushels were harvested, or at the rate of 274 bushels per acre. Several farmers in Lee in Penobscot county, report yields from 300 bushels to 500 bushels per acre, and other towns have done as well.

While the raising of potatoes in commercial quantities is generally conceded to be one of the most remunerative branches of farming in Maine, yet there have been seasons when the value of the crop hardly paid the cost of production. The hardest season in recent years for the potato farmer, not only in Maine but also in all the great potato producing states of the country, was that of 1895. On the first day of December of that year the prices quoted per bushel in some of the states were as follows: Minnesota, 14 cents; Michigan, 16 cents; Wisconsin and North Dakota, 17 cents; Iowa, 19 cents; New York, 23 cents; Missouri, 25 cents; South Dakota and Vermont, 26 cents; Pennsylvania and Washington, 28 cents. The average quotation for the whole country was 26.57 cents per bushel, and later in the season prices dropped to a very low figure, so that potatoes were hardly worth the handling, and many were sold at a nominal price during the spring and made into starch.

The crop in Maine that year amounted to 10,139,089 bushels, a much larger yield than the State had ever produced, with the exception of 1839, and it was not again equaled until 1902. The crop in the whole country the same year amounted to 297,237,370 bushels, a yield which has never been equaled, before or since. In addition to the enormous crop, business throughout the country was largely at a standstill, willing hands were out of work and markets were demoralized. But such a combination of adverse circumstances does not often occur.

With changed business conditions, notwithstanding the immense yield of 284,632,787 bushels in 1902, the second largest crop ever produced in the country, Maine's product of 10,481,510 bushels sold at remunerative prices, and the unprecedented crop of 17,067,092 bushels in the State in 1903 was a mine of wealth to the producers.

There are risks and uncertainties in all kinds of business, in potato growing as well as in commercial and mercantile pursuits. Continued spring rains may delay planting, and the same conditions after planting may cause much of the seed to decay. A drouth may curtail or nearly ruin the crop, or an early frost do it much damage. The potato bug and potato rot must be dealt with, and the price and availability of farm labor has a bearing on the matter. An immense yield throughout the country may so cheapen the price that the investment will pay no dividend, or great disturbances in the industrial world may throw labor out of employment, stop the general circulation of money, and produce a like result.

The above are some of the conditions that may occur, but past experience has taught us that they are more likely to remain in the background or to be overcome by the intelligent work of the producer, than they are to ruin his crop of potatoes.

The potato bug can be destroyed by insecticides, and it is believed that the rot can be prevented or reduced to a minimum by persistent spraying. There is no state more exempt from the effects of flood and drouth, and no state where larger crops of potatoes can be grown than in Maine, and as to quality they are equal to the best. Machinery has cheapened their production and the starch factories take care of the small and otherwise worthless potatoes. The crop is as certain as any other cultivated in the State, and perhaps more so, and the average price received makes it as profitable a crop as any grown on the farm.

While it is not advisable that every Maine farmer should raise potatoes to the exclusion of other annual crops or other lines of agricultural industry, yet there is no doubt that, for a profitable cash crop year after year, the potato has the lead in our State.

MAINE'S MILLING INDUSTRY.

In prosecuting the work of investigation of the grist mill industry, blanks were placed in the hands of every mill owner in the State. While some failed to make returns many others had kept no records of their business, and their returns contained so little information as to be of no value. Although the number of returns compiled for use in this article represents less than half the number of mills, yet the greater part of them came from the larger plants and cover about two-thirds of the milling done in Maine.

This is our first attempt to make an investigation of this industry, and it is to be regretted that conditions were such as to render the matter incomplete, as we always desire to make thorough work of whatever is undertaken.

A gradual change is going on in the milling industry. The old fashioned native mill stones are being displaced by the French buhrstone and the steel rollers. The old time custom grist mill, where the miller took his toll out of the grist, is being superseded by more modern methods, and while formerly practically all the mills ground for family use, in recent years the mills that grind for feed only are multiplying rapidly.

From the early settlement of the State mills have been in use for grinding corn, wheat and other grain. As the people for many years depended for a livelihood principally upon the products of their farms, largely corn and grain, grist mills were a necessity. Small streams affording water power were abundant in every section of the State, and grist mills were erected in every considerable settlement. At first these mills were crude, the millstones being cut from the rock in which the country abounded, and serving only to grind the grain into meal, but as time advanced improved stones were introduced and much excellent flour was made for home consumption.

For several years the State paid a small bounty on every bushel of wheat raised and in this way greatly stimulated the raising of the cereal.

With very few exceptions the early grist mills of Maine did custom grinding only, but later, as the raising of corn in the State largely fell off, an extensive wholesale trade grew up in the larger cities, and mills of greater capacity were erected at these central points. As a result cracked corn and corn meal, instead of whole corn, are now largely distributed to retailers throughout the State.

Within a few years several large milling plants using the roller process have been erected in Aroostook county, in which large quantities of native wheat are converted into flour. This has stimulated the cultivation of wheat in the fertile valley of the Aroostook.

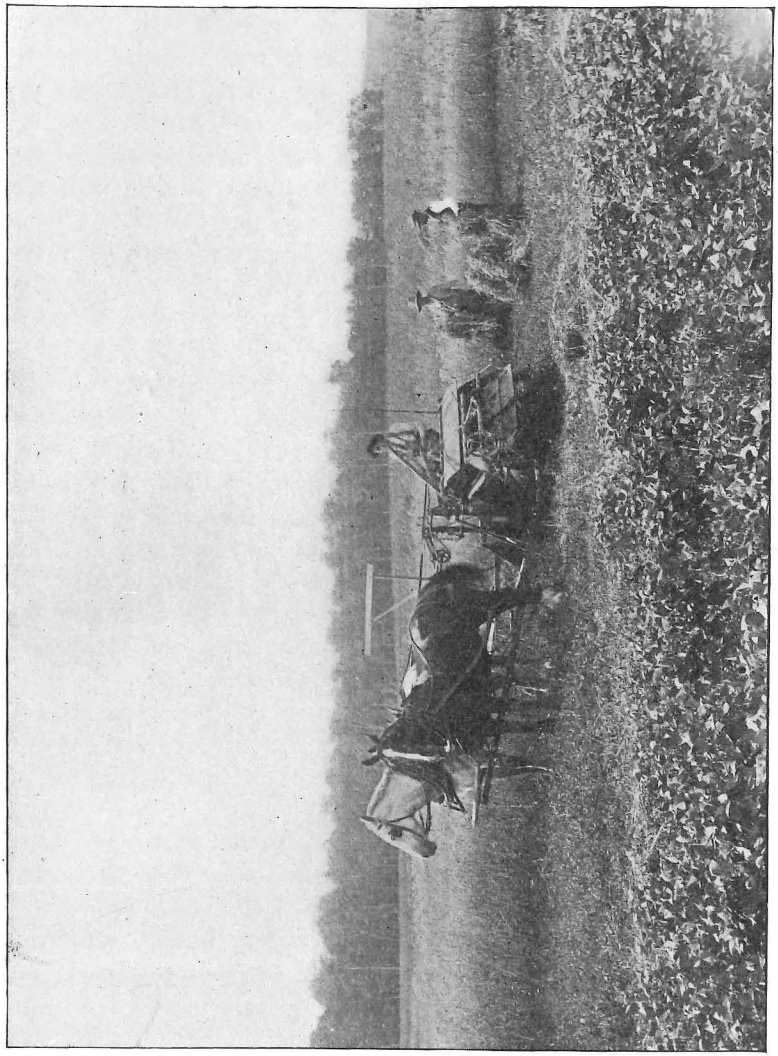
Maine is nearly as large as all the rest of New England combined. The total land area of the State, as given by the United States Census of 1890, is 29,895 square miles. In giving the land area of the several counties in this article we have quoted the same authority. Of this total land area, 20,052 square miles were then in the wilderness state, leaving only 9,843 square miles in farms. Of this 9,843 square miles of farm land only 3,729 square miles were tilled, leaving 6,114 square miles in pastures, woodlots, etc. It will readily be perceived from the above that some states of much smaller area have more land under cultivation than Maine.

In 1899 the State had 166,896 acres devoted to the cereals, on which were produced 5,291,655 bushels. The greatest area of this was in oats, nearly 65 per cent of the entire amount being given to that cereal, 108,661 acres having been cultivated, on which 3,799,435 bushels were raised.

The total number of farms in Maine in 1899 was 59,299. The average size was 106.2 acres, the total acreage being 6,299,246, but of this 62.1 per cent was unimproved. The total value of farm products in 1899 was $37,113,469.

The State of Maine lies between forty-three degrees and six minutes, and forty-seven degrees, twenty-seven minutes and thirty-three seconds north latitude, the forty-fifth parallel of latitude crossing the State very near its geographical center. The mean annual temperature for the whole State is forty and

eighty-eight hundredths degrees. It will thus be seen that the average temperature of Maine is cool, although the summers are generally warm. All the hardy grains, fruits, berries and



AN AROOSTOOK OAT FIELD WITH REAPER.

vegetables can be successfully cultivated. The soil and climate of Maine is well adapted to the raising of wheat, rye, oats, barley and buckwheat. Corn can be successfully raised in all the

southern portions of the State, but is an uncertain crop in the extreme northern portion. A line drawn irregularly across the State from the vicinity of the Rangeley lakes to Mars Hill would very nearly mark the northern boundary of the corn belt.

The development of the great central states in what is known as the corn belt of the United States, and the enormous crops of corn there produced, taken together with the remarkable transportation facilities afforded by railroads, canals, and the commerce of the great lakes, have all had a tendency to so cheapen this once important Maine crop that its cultivation at the present time gives the farmer of our State but little profit; consequently the census returns show a marked decrease in the number of bushels of corn raised in Maine at nearly every decade since 1849. The cultivation of sweet corn, however, for canning purposes, has increased largely within the last few years.

What has just been said in regard to the raising of corn in the State of Maine, can, with almost equal force, be said concerning the production of wheat. The introduction of the roller mill, however, has had the effect of increasing its production, and in some parts of the State a gratifying increase in the annual product of this cereal is observed.

To show the decrease in the production of corn and wheat within the last half century it may be stated that in 1849 the number of bushels of corn raised in the State was 1,750,056, and in 1899 the number of bushels raised was 645,040. In 1849 there were 296,259 bushels of wheat raised in Maine, and in 1899 the number of bushels was 116,720. The other cereals show an increase in production in the northern counties, with the exception of rye.

The development of agriculture in the southern part of Maine during the past fifty years has been attended by changes similar to those noted in other New England states, namely, a steady growth in the importance of dairying and market gardening, and a marked decrease in the acreage devoted to cereals. In the northern part of the State, where agriculture has been more recently developed, very different conditions prevail. The distance from city markets, while retarding the development of special branches of husbandry, has favored general farming, and the production of such cereals as are adapted to the soil and climate has been steadily increasing for several decades.

This is especially true of Aroostook county, where the total area in cereals increased 37,116 acres, or 82.6 per cent, from 1879 to 1899, while for the remainder of the State there was a decrease of 57,233 acres, or 40.3 per cent. In 1879 Aroostook county cultivated 24 per cent of the total acreage in cereals; in 1889, 33.5 per cent; and in 1899, 49.2 per cent, or approximately one-half the acreage of the State.

Of the total area in cereals in 1899, 65.1 per cent was devoted to oats; 15.1 per cent to buckwheat; 10.1 per cent to corn; 5.3 per cent to barley; 4 per cent to wheat; and .4 of one per cent to rye. Most of the barley is raised in the southern counties, and the total acreage of this grain decreased 26.4 per cent in the last decade. In 1899, 83.7 per cent of the total area devoted to buckwheat was in Aroostook county; also 48.4 per cent of the total acreage in oats, and 86.4 per cent of the total acreage devoted to wheat. Very little attention is given to rye.

The acreage given for cereals does not include the 14,212 acres of grain cut green for hay, nor the 12,494 acres devoted to corn, non-saccharine sorghum and similar crops, grown for forage or ensilage. Our returns from mill owners also show that in many parts of the State mixed grains, such as wheat, barley and oats, or wheat, oats and rye, are raised in considerable quantities for feed.

With the above general survey of the cereal area and production of the State, a clearer understanding of the answers to the questions sent to mill owners will be obtained.

QUESTIONS SENT TO MILL PROPRIETORS.

The following list of questions was printed on the official blanks of the Bureau of Industrial and Labor Statistics and a blank, together with a postpaid envelope, was mailed to every mill owner in the State, as far as the same could be ascertained. The questions were as follows:

1. Name of town or city where plant is located..... post office.....
2. What is the value of your plant?.....
3. Is your mill run by steam, water or electric power?.....
4. Total horse power used.....

5. Is yours a roller mill, or have you runs of stones, or both?.....

6. Number of pairs of rolls.....number of runs of stones.....

7. Is yours a feed mill, or for grinding for family use, or both?.....

8. Is your mill a custom mill, or a mill where the proprietors buy the raw material?.....

9. Is your mill constantly in operation, or only occasionally?.....

10. State approximately the number of bushels of corn ground .....wheat .....rye .....barley ....oats ..... buckwheat .....for last fiscal year.

11. State approximately the number of bushels of the above raised in Maine .....corn .....wheat ..... rye .....barley .....oats .....buckwheat .....

12. Number of hands employed.....

13. Average daily wages paid.....

14. If a custom mill, what was your income from toll or cash paid for grinding for the last fiscal year?..... Approximate value of all grain ground.....

15. If you buy grain, cost of material for the last fiscal year.....Gross value of product.....

16. Are the farmers in your vicinity raising more grain and corn than formerly?.....

LIST OF GRIST MILLS BY COUNTIES.

In the following list are presented the names and locations of mill proprietors who responded to the call for information sent out by the Bureau.

Androscoggin County.

Auburn, J. E. Tibbetts and Company, G. F. Parsons (East), J. P. Vickery and Company.

Poland (East), Bailey Brothers.

Webster (Sabattus), Judson Bangs.

Aroostook County.

Caribou, H. A. Edwards and Company.
Fort Fairfield, D. E. Edwards.
Fort Kent, Fort Kent Mill Company.
Houlton, E. Merritt and Sons, two mills.
Sherman (Mills), John Gosnel.
Van Buren, Van Buren Lumber Company.
Washburn, Thomas H. Phair.

Cumberland County.

Bridgton, Hall and Hamblen.
Brunswick, D. and C. E. Scribner.
Cumberland (Center), O. S. Thomes.
Harpswell (Center), Curtis and Pierce.
Harrison, H. H. Caswell.
New Gloucester (Intervale), J. S. True.
North Yarmouth (East), F. W. Loring.
Portland, F. A. Waldron and Son, S. W. Thaxter and Company.
Pownal (West), Charles L. Dow.
Westbrook, J. W. Morris.

Franklin County.

Chesterville (North), L. S. Keith.
Farmington, Ranger, McLeary Company.
Wilton, George R. Fernald and Company.

Hancock County.

Dedham, J. T. Black.
Eden (Bar Harbor), Nickerson, Spratt and Greeley.
Gouldsboro, William L. Guptill.
Orland, S. R. Hutchins.
Sullivan (East), Herman Smith.

Kennebec County.

Augusta, B. F. Parrott Company, Pinkham and Philbrick.
Gardiner, W. M. Wood and Son.

Oakland, S. H. Morrill and Son.
Readfield, W. C. Record.
Vassalboro (East), Thomas Piper.
Waterville, Merrill, Runnels and Mayo Company.

Knox County.

Appleton (North), Robert S. Keene.
Camden, Camden Grist Mill Company, Frye and Porter.
Rockport, S. E. and H. L. Shepherd Company.
Thomaston, J. A. Creighton and Company.
Vinalhaven, C. F. Noyes.

Lincoln County.

Bristol, W. J. Hatch.
Waldoboro (Winslow's Mills), Vannah, Chute and Company.
Wiscasset, Wiscasset Grain Company.

Oxford County.

Bethel, Woodbury and Purington.
Denmark (East Fryeburg), Warren Brothers.
Hanover, Harry A. Staples.
Hiram, E. W. Bosworth.
Norway, C. B. Cummings and Sons, A. C. McCrellis, Partridge Brothers.
Paris (South), Maxim and Russell, A. E. Shurtleff.
Porter (Stanley), Charles W. Young.
Rumford (Falls), James S. Morse.
Upton, H. S. Raymond.
Woodstock (Bryant's Pond), E. Andrews.

Penobscot County.

Bangor, A. R. Hopkins and Company, J. C. Towle and Company.
Carmel, Damon Brothers.
Corinth, Frank H. Skinner.
Dexter, S. L. Small.
Exeter (Corinna), A. J. Ordway.
Hampden (Bangor, R. F. D. 2), F. F. Emerson.
Mattawamkeag, B. Wyman and Son.

Piscataquis County.

Foxcroft, A. W. Gilman and Company, E. A. Ireland.
Greenville, M. G. Shaw Lumber Company.
Guilford, Hussey and Goldthwaite.
Sangerville (East), K. P. Knowlton.
Sebec, A. H. Morrison.

Sagadahoc County.

Bath, C. A. Hooker, Kimball Brothers.
Richmond, C. H. Reed.
Woolwich, Eben Dana.

Somerset County.

Canaan, Williams and Gleason.
Fairfield, F. J. Savage and Company.
Madison, Weston and Weston.
Pittsfield, Hunter and McMaster Company.
Skowhegan, D. A. and W. E. Porter, Steward Brothers.
Solon, C. H. Severy and Son.
Starks, C. W. Snell.

Waldo County.

Belfast, Fred Holmes, Mathews Brothers, Swan and Sibley Company.
Brooks, Swan and Sibley Company.
Lincolnville, William L. Howe.
Monroe, Fred L. Palmer.

Washington County.

Brookton, L. O. Dudley.
Calais (Milltown), William Hutchinson, (Red Beach), Red Beach Plaster Company.
Eastport, Blanchard Manufacturing and Canning Company.
Machias, D. C. Getchell and Company.
Pembroke, E. H. Sprague and Son.

York County.

Berwick, J. A. Tebbetts.
Biddeford, Bean Brothers.
Lyman, Dolliff and Walker.
North Berwick, D. P. Morrill.
South Berwick, Mrs. C. F. Varney.

FACTS, FIGURES AND SUGGESTIONS GATHERED FROM THE RETURNS.

Androscoggin County.

From Androscoggin county five returns were received, reporting an aggregate value of plants of $16,500. Four mills are run by water, developing 115 horse power; and one is run by steam, developing 20 horse power, a total of 135 horse power.

The five mills run stones only. The total equipment consists of 8 runs of stones. Three are feed mills, and two grind both for feed and family use. Two are proprietary mills, that is, buy the raw material wholly, and three both custom and proprietary. Four are in constant operation, while one is run the larger part of the time.

The amount of grain ground was 105,000 bushels of corn, and 24,600 bushels of oats, of which amount there were grown in Maine 600 bushels of corn, and 300 bushels of oats. In three mills 2 hands are employed constantly, one of the mills also employing a third hand a part of the time. In the other two the work is done by the proprietors. Wages vary from $1.75 to $2.00 per day, averaging $1.83.

The value of custom ground grain was $6,828, from which a toll of $333 was received. The value of grain purchased was $72,492, worth $78,180 when manufactured. The total value of products was $85,341.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" three proprietors answered, they are not; one answered, I think so; and one answered that he did not know.

Androscoggin county has a land area of 485 square miles. It is made up of twelve towns and two cities. The Androscoggin river flows through the county and affords some of the finest water powers in New England. Hence we find such

flourishing manufacturing cities and towns as Lewiston, Auburn, East Livermore and Lisbon. Farmers give considerable attention to raising sweet corn for canning purposes; also to raising vegetables and small fruits for the markets in these industrial centers. All the grains, fruits, berries and garden vegetables can be raised in this county successfully.

Aroostook County.

From Aroostook county eight returns were received, reporting an aggregate value of plants of $54,000. One mill is run by water and electricity, developing 80 horse power; four by water and steam, developing 170 horse power; and three by water only, developing 180 horse power, a total of 430 horse power.

Two mills use stone grinders only, five use both rollers and stones, and one rollers only. The total equipment of the eight mills consists of 38 pairs of rollers, and 17 runs of stones. One is a feed mill, and seven grind both for feed and family use. One is a custom mill, one proprietary, and six both custom and proprietary. Five are in constant operation, two run most of the time, and one grinds only an occasional grist.

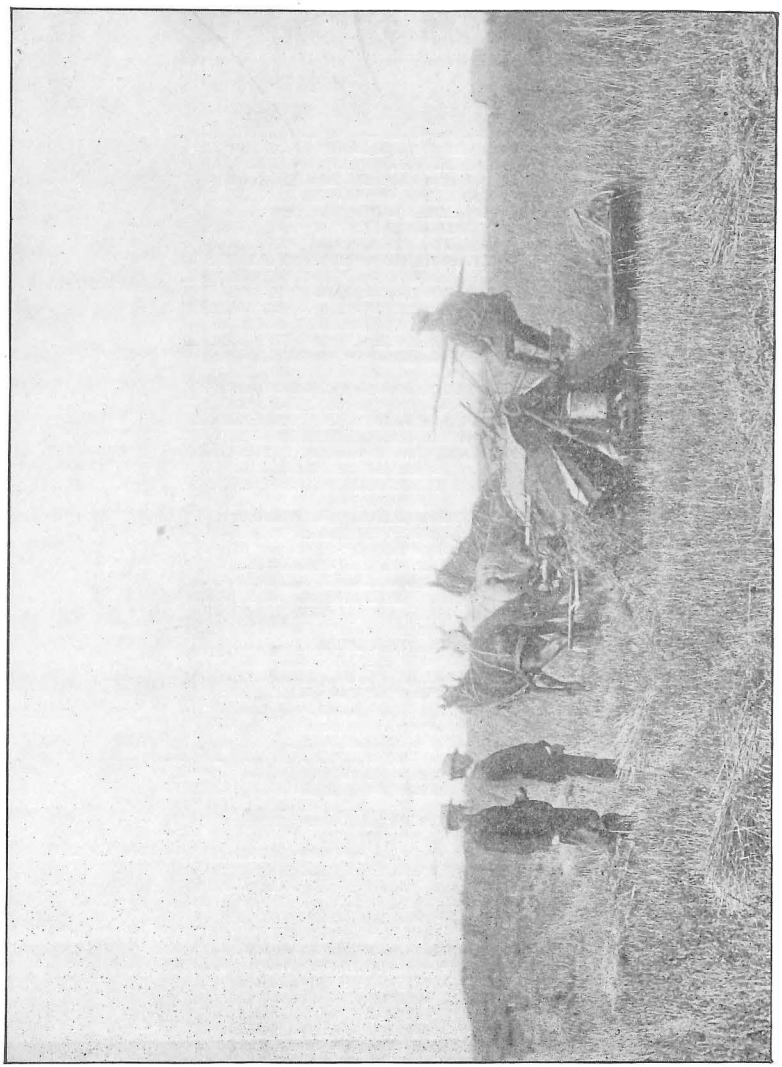
The amount of grain ground during the year was 62,500 bushels of corn, 79,218 bushels of wheat, 1,000 bushels of rye, 11,000 bushels of barley, 32,873 bushels of oats, and 63,590 bushels of buckwheat, all of which was grown in Maine with the exception of the corn, that having been brought from the West. One proprietor did his own work, while the other seven mills employed 14 hands, with wages varying from $1.50 to $2.00 per day, and averaging $1.83.

The value of custom ground grain was $89,990, from which a toll of $7,031 was received. The value of grain purchased was $112,600, worth $121,733 when manufactured. The value of products amounted to $218,754.

In answer to the question, "Are the farmers in your vicinity raising more grain and corn than formerly?" four mill owners answered, they are raising more; one answered, they are raising more wheat; and two answered, they are raising less grain than formerly.

In addition to the above we have verbal reports as to the amount of wheat ground, from the three large flour mills in

this county which failed to make returns. The additional figures would indicate that about 130,000 bushels of Aroostook grown wheat of the crop of 1903 were ground in the county, the total crop for the State that year being 207,366 bushels.



AN AROOSTOOK WHEAT FIELD WITH REAPER. (Farm of C. H. Doe, Caribou).

Aroostook county contains 6,700 square miles of land area, and is the northern county of the State; in fact, the whole northern section of Maine is in Aroostook county. The county

is very nearly equal, in area, to the whole state of Massachusetts. The St. John river forms the northern boundary of the county and the State. The valley of the St. John in Maine is a fertile section and in the eastern parts are some of the finest farms in the county. This section produces large quantities of wheat, oats, barley and buckwheat.

The Aroostook valley is another fertile section. The Aroostook river rises in the central portion of the county and flows in

AN AROOSTOOK ORCHARD. (Limbs Propped to Prevent Breaking).

an easterly direction, finally emptying into the St. John river just over the border, in New Brunswick. This is one of the most productive valleys in the State, and all the grains are grown here very successfully. In the southern portion of the county are the valleys of the Meduxnekeag, the Mattawamkeag, and several smaller streams.

The whole county seems to be underlaid with a calcareous shale rock which apparently supplies lime to the soil. The cultivated part of the county is a strip on the eastern side, border-

ing New Brunswick. The whole western and northwestern section is an almost unbroken forest.

The county is one of the best agricultural sections of New England, and all the cereals, except corn, can be raised in abundance. Apples and plums can be raised, except in the extreme north, while small fruits can be cultivated successfully in the southern part of the county. While more grain is raised in Aroostook county than in any other part of Maine, so profitable has been the raising of potatoes in late years that the raising of grain seems to be only of secondary consideration.

Cumberland County.

From Cumberland county eight returns were received, reporting an aggregate value of plants of $51,500. Four mills are run by steam, developing 58 horse power; two by electricity, developing 115 horse power; one by water, developing 40 horse power; and one by gasoline, developing 14 horse power, a total of 227 horse power.

Three are roller mills, four run stones only, and one has both rollers and stones. The total equipment of all these mills consists of 19 pairs of rollers, and 7 runs of stones. One is a feed mill, and seven grind both for feed and family use. Five are proprietary mills, one is a custom mill, and two are both custom and proprietary. Two are constantly in operation, while six are operated only a part of the time.

The amount of grain ground during the year was 299,000 bushels of corn, 1,200 bushels of wheat, 2,100 bushels of rye, and 15,850 bushels of oats, of which amount 900 bushels of corn, and 600 bushels of oats were raised in Maine.

One proprietor did his own work, while in the other seven mills 24 hands were employed, with wages varying from $1.25 to $2.25 per day, averaging $1.68.

The value of custom ground grain was $2,450, from which a toll of $225 was received. The value of grain purchased was $202,782, worth $219,982 when manufactured. The total value of products was $222,657.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" four answered, no; two answered, yes; two answered that they did not know; and one that more corn is raised.

Cumberland county contains 1,005 square miles of land area. Its largest river is the Presumpscot, the outlet of Sebago, the largest lake in southern Maine. This river furnishes over 20,000 horse power for manufacturing purposes in its 22 miles from the lake to the sea, and many large industries are found along its course.

This county has many fine agricultural towns, and all the cereals, fruits and small fruits can be raised in abundance. Probably market gardening is carried on here more extensively than in any other county in the State. Our returns show but little grain or corn raised in the county, but the mill proprietors purchase largely from the West. Sweet corn, fruits and vegetables seem to be the principal agricultural products, although hay and potatoes are large crops in certain sections.

Franklin County.

From Franklin county three returns were received, reporting an aggregate value of plants of $16,300. Two mills are run by water, developing 75 horse power; and one by steam, developing 25 horse power, a total of 100 horse power.

Two mills run stones only, while one runs an attrition mill in addition to stones. The total equipment of the three mills consists of 7 runs of stones, and 1 attrition mill. Two grind both for feed and family use, and 1 grinds feed only. One is a custom mill, one proprietary, and one both custom and proprietary. One runs constantly, and two only a part of the time.

The amount of grain ground in the three mills was 45,000 bushels of corn, 500 bushels of barley, and 23,500 bushels of oats, of which amount there were raised in Maine 6,000 bushels of corn, 500 bushels of barley, and 3,000 bushels of oats. At one mill the proprietor did his own work, while the other two employed 7 hands. Wages varied from $1.50 to $1.75 per day, averaging $1.71.

The value of custom ground grain was $5,775, from which a toll of $550 was received. The value of grain purchased was $34,425, worth $38,125 when manufactured. The total value of products was $44,450.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" all answered less than formerly.

Franklin county has a land area of 1,660 square miles. Its surface is more diversified than that of any county in the State. It has three mountains that attain a height of about 4,000 feet each, namely, Saddleback mountain, Mount Abraham and Mount Blue. The Rangeley lakes lie partly in Franklin and partly in Oxford counties, while the Androscoggin river flows across the southwest corner of the county.

Along the river valleys of this county, particularly the Sandy river valley, are found some of the most productive sections of Maine. All the grains, fruits and berries can be grown here successfully. There are some woolen mills, one or two edge tool factories, and several wood novelty mills in the county, but the main industry is agriculture, although not nearly as much corn and grain is raised now as formerly. Apple culture is carried on extensively and this branch of farming is increasing. A large amount of sweet corn is raised, while hay and potatoes form a considerable portion of the farmers' product.

Hancock County.

From Hancock county five returns were received, reporting an aggregate value of plants of $6,700. Four mills are run by water, developing 112 horse power; and one is run by steam, developing 50 horse power, a total of 162 horse power.

Two are roller mills, and three grind with stone only. The total equipment of the five mills consists of 6 pairs of rollers, and 3 runs of stones. Three are feed mills, and two grind both for feed and family use. Three are custom mills, and two are proprietary. One runs constantly, and four only a part of the time.

The amount of grain ground was 65,200 bushels of corn, 60 bushels of wheat, 2,070 bushels of barley, and 4,670 bushels of oats, of which amount there were grown in Maine 129 bushels of corn, 60 bushels of wheat, 2,070 bushels of barley, and 3,000 bushels of oats. In four of the mills the work was done by the proprietors, while in the other, 4 hands were employed, with wages averaging $2.00 per day.

The value of custom ground grain was $10,367, for which a toll of $838 was paid. The cash value of grain purchased was $31,800, worth $33,708 when manufactured. The total value of products was $44,913.

In answer to the question, "Are the farmers in your vicinity raising more grain and corn than formerly?" one proprietor answered, more oats and barley, not so much corn; one answered, about the same as formerly; one answered, more barley, oats and peas; and two answered, not nearly as much as formerly. One mill owner wrote that twenty years ago he ground 1,500 bushels of wheat a year, and now grinds none; also that he ground many more oats than now. Another wrote that his business had fallen off one-half within a year or two, on account of the traders buying Western meal instead of whole corn.

Hancock county enjoys the distinction of having the most extensive seaboard and more harbors than any coast of equal extent in the United States. There are said to be 300 islands within the limits of the county. Its land area is 1,312 square miles. The Union river valley is the best agricultural section of the county, although there are numerous small fertile valleys scattered all through the whole region.

Hancock is the great summer resort county of the State, for within its borders are Bar Harbor, Sorrento, Southwest Harbor, Northeast Harbor, and other noted resorts. Farmers in the vicinity of these resorts have turned their attention largely to market gardening and poultry raising, to the neglect of raising grain.

Kennebec County.

From Kennebec county seven returns were received, reporting an aggregate value of plants of $43,500. Three mills are run by water, developing 165 horse power; two by steam, developing 55 horse power; one by water and steam, developing 100 horse power; and one by water and electricity, developing 80 horse power, a total of 400 horse power.

One is a roller mill, four grind with stones only, one has both rollers and stones, and one runs a mill for crushing and grinding whole ears of corn, in addition to stones. The total equipment of the seven mills consists of 14 pairs of rollers, 12 runs of stones, and 1 mill for whole ears of corn. Three grind for feed only, and four both for feed and family use. One is a custom mill, three proprietary, and three both custom and proprietary. Four run constantly, and three only a part of the time.

The amount of grain ground in the seven mills was 380,000 bushels of corn, 220 bushels of wheat, 210 bushels of rye, 2,400 bushels of barley, 23,800 bushels of oats, and 4 bushels of buckwheat, of which amount there were raised in Maine 9,000 bushels of corn, 20 bushels of wheat, 10 bushels of rye, 2,400 bushels of barley, 3,100 bushels of oats, and 4 bushels of buckwheat. The number of hands employed was 26. Wages varied from $1.50 to $2.00 per day, averaging $1.86.

The value of custom ground grain was $29,410, for which a toll of $2,000 was paid. The value of grain purchased was $233,505, worth $258,080 when manufactured. The total value of products was $289,490.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" three proprietors answered, not as much; two answered, more; and two answered, about the same as formerly, but more sweet corn.

Kennebec county has a land area of 888 square miles. It is in the central part of the State and the Kennebec river flows through the county from north to south. The surface is much broken by hills, but there are no mountains. The underlying rock is granite, and at Hallowell are some of the finest granite quarries in the world. The soil is very fertile and the county is one of the best agricultural sections of the State. The Kennebec river furnishes grand water powers at Waterville and Augusta, and large cotton mills are found in both of these cities. There are also large pulp and paper mills in the county, and many smaller manufactories.

This county produces fine apples, and large quantities of hay and potatoes. It is undoubtedly a fact that less corn and grain are raised here than formerly, but more sweet corn, apples and small fruits. The soil and climate are adapted to raising all the cereals, and fruits of all kinds.

Knox County.

From Knox county six returns were received, reporting an aggregate value of plants of $35,275. Four mills are run by water, developing 160 horse power; one by steam, developing 40 horse power; and one by gasoline, developing 35 horse power, a total of 235 horse power.

Four are roller mills, one uses stones only, and one has both rollers and stones. The total equipment of the six mills consists of 13 pairs of rollers, and 2 runs of stones. Two are feed mills only, and 4 grind both for feed and family use. One is a custom mill, while the other five purchase all their grain. None of them run on full time.

The amount of grain ground during the year in the six mills was 78,500 bushels of corn, 50 bushels of barley, and 300 bushels of oats, of which amount there were grown in Maine 20 bushels of corn, 50 bushels of barley, and 100 bushels of oats. Nine hands were employed, the rate of wages varying from $1.50 to $2.00 per day, averaging $1.85.

The value of custom ground grain was $654, which paid a toll of $46. The value of grain purchased was $50,530, worth $54,500 when manufactured. The total value of products was $55,200.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" five mill owners answered that they are not, and one that they are. One proprietor answered that there is no corn raised in his vicinity except sweet corn for canning purposes.

Knox county has a land area of 328 square miles. The Georges river flows through the county from north to south, dividing it into two nearly equal parts. Some of the best agricultural sections are found in the Georges valley.

The county has many high elevations of land, known collectively as the Camden hills. Mount Megunticook is 1,265 feet high; Ragged mountain, 1,230 feet high; Mount Pleasant, about the same; Bald mountain, 1,140 feet; and Mount Battie, 1,000 feet. There are several other slighter elevations, making the scenery of Camden and several neighboring towns very attractive. As a summer resort this county is increasing in favor, and the shores along Penobscot bay are fast becoming dotted with cottages of summer tourists.

The production of lime may be said to be the leading pursuit of Knox county, although of late years market gardening and the raising of fruit have increased wonderfully. The soil in the valleys is very fertile and all the cereals, small fruits and vegetables can be grown successfully. The farmer and market

gardener finds a ready demand in the local markets for all he produces.

Lincoln County.

From Lincoln county two returns were received, reporting an aggregate value of plants of $9,500. One mill is run by water and steam, developing 40 horse power; and one by gasoline, developing 30 horse power, a total of 70 horse power.

Both mills use rollers and stones. The total equipment of the two mills consists of two pairs of rollers, and two runs of stones. One is a feed mill, and one grinds both for feed and family use. Both mills buy grain and are in constant operation.

The amount of grain ground was 150,000 bushels of corn, 500 bushels of wheat, 100 bushels of rye, and 5,000 bushels of oats, none of which was grown in Maine. Six hands were employed, and wages varied from $1.75 to $2.00 per day, averaging $1.87. The grain purchased cost $95,000, worth $101,500 when manufactured, this being the total value of products reported.

In answer to the question, "Are farmers in your vicinity raising more corn and grain than formerly?" both proprietors answered, they are not.

Lincoln county has a land area of 520 square miles. It is much cut up by arms of the sea and pond-like rivers but there are no great variations of altitude in the surface. Damariscotta river occupies nearly the middle line of the county, extending from north to south. Parallel to this on the west is Sheepscot river with its excellent harbor at Wiscasset, and in the eastern section is the Medomac river. These river valleys are all fertile and are adapted to the raising of all the cereals, as well as fruits, berries and vegetables. The county is not one of the best agricultural sections of the State, hence we find but little corn and grain furnished to the mills from local farmers.

The canning of sardines is one of the leading pursuits of this county, while the production of granite from the excellent quarries in Waldoboro gives employment to many workmen. Boothbay and Bristol are noted as summer resorts, and many farmers in the vicinity have turned their attention to market gardening and poultry raising to supply summer hotels and boarding houses.

Oxford County.

From Oxford county twelve returns were received, reporting an aggregate value of plants of $37,600. Four mills are run by water, developing 144 horse power; one by steam, developing 20 horse power; four by electricity, developing 80 horse power; and three by gasoline, developing 66 horse power, a total of 310 horse power.

Three are roller mills, seven use stones only, and two use both rollers and stones. The total equipment of the twelve mills consists of 19 pairs of rollers, and 13 runs of stones. Three are feed mills, and nine grind both for feed and family use. Two do custom grinding only, six purchase all their grain, and four are both custom and proprietary. Seven run constantly, and five only a part of the time.

The amount of grain ground was 334,400 bushels of corn, 1,250 bushels of wheat, 400 bushels of rye, 200 bushels of barley, 116,500 bushels of oats, and 540 bushels of buckwheat, of which amount there were raised in Maine 2,300 bushels of corn, 75 bushels of rye, 200 bushels of barley, 1,050 bushels of oats, and 540 bushels of buckwheat. In three mills the work was all done by the proprietors. In the other nine there were 21 hands employed, with wages varying from $1.25 to $2.00 per day, and averaging $1.60.

The value of custom ground grain was $28,170, from which a toll of $2,400 was received. The amount paid for grain was $233,187, worth $252,450 when manufactured. The total value of products amounted to $283,020.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" five proprietors answered, not so much; six answered, they are raising more; and one answered, they are raising more sweet corn.

Our returns from mill proprietors seem to indicate the same changes in agricultural methods in this county as in other sections, that is, the raising of less grain and corn, and the raising of more sweet corn for canning purposes, an increase in fruit culture, and the raising of small fruits and vegetables.

Oxford county has a land area of 1,892 square miles. Its extreme length is about 100 miles, and as it lies in near neighborhood to the White mountains of New Hampshire, Oxford

county is emphatically the hill region of Maine. The county has more lofty mountain peaks than any other equal extent of territory in New England, with the exception of northern New Hampshire. Among these are Mount Pleasant in Denmark, Speckled mountain in Grafton, and Streaked mountain in Buckfield. The famous Mount Mica is in Oxford county, and many localities in the county abound in beautiful tourmalines and other gems.

The Rangeley lakes lie mostly in this county, and the Androscoggin river runs for nearly one-third of its length within the limits of the county. The Saco and the Little Androscoggin are the two most important streams, aside from the Androscoggin. The intervales along all these rivers are extremely productive, and all the numerous valleys among the hills contain fertile lands adapted to the raising of all the cereals. The county is one of the best fruit growing sections of Maine and this branch of agriculture is increasing rapidly.

The development of Rumford Falls, by the utilization of the mighty water power there, is building up a thriving manufacturing town, and its immense paper mills are among the largest in the world.

Penobscot County.

From Penobscot county six returns were received, reporting an aggregate value of plants of $29,000. Four mills are run by water, developing 280 horse power; one by steam, developing 50 horse power; and one by gasoline, developing 8 horse power, a total of 338 horse power.

Two are roller mills, one has runs of stones only, one runs both rollers and stones, one has rollers and a disc mill, and one is a corn and cob crushing mill. The total equipment of the six mills consists of 20 pairs of rollers, 5 runs of stones, 1 disc mill, and 1 corn and cob crusher mill. Two are feed mills, and four grind both for feed and family use. Two are custom mills, three proprietary, and one both custom and proprietary. Three run constantly, and three only a part of the time.

The amount of grain ground was 495,000 bushels of corn, 400 bushels of wheat, 50 bushels of rye, 1,000 bushels of barley, 53,000 bushels of oats, and 5,000 bushels of buckwheat, of which amount there were grown in Maine 7,000 bushels of corn,

400 bushels of wheat, 50 bushels of rye, 500 bushels of barley, 9,000 bushels of oats, and 5,000 bushels of buckwheat. Two proprietors did their own work. In the other four mills 10 hands were employed, with wages ranging from $1.50 to $2.00 per day, and averaging $1.80.

Grain to the value of $18,837 was custom ground, for which a toll of $1,065 was paid. The cash value of grain purchased was $320,500, worth $336,600 when manufactured. The total value of products was $356,502.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" three mill owners answered, more than formerly; and three answered, not so much.

Penobscot county contains a land area of 3,332 square miles. The county is very irregular in shape and may be said to consist of several rectangles joined together. The Penobscot river flows nearly through the entire length of the county from north to south. This river furnishes many valuable water powers from its source to tide water, and from Old Town to Bangor are a succession of magnificent powers, where some of the largest lumber mills in the State are found. There are also large pulp and paper mills along this river. Penobscot county has been in the past, and is now, the leading county in the State in the manufacture of lumber.

The county is not mountainous, but there are many hills, and the surface is much broken. The river valleys are fertile and all the cereals can be raised here successfully, as well as fruits, berries and vegetables. In Orono is the University of Maine, and on the fine farm connected with it can be seen agriculture carried to perfection.

Piscataquis County.

From Piscataquis county five returns were received, reporting an aggregate value of plants of $21,500. Three mills are run by water, developing 80 horse power; one by gasoline, developing 15 horse power; and one by water and gasoline, developing 50 horse power, a total of 145 horse power.

Two are roller mills, two grind with stones, and one has both rollers and stones. The total equipment of the five mills consists of 10 pairs of rollers, and four runs of stones. One is a feed mill, and four grind both for feed and family use. All pur-

chase more or less grain and also do custom grinding. Two run continuously, and three run only a part of the time.

The total amount of grain ground was 98,650 bushels of corn, 500 bushels of wheat, 3,000 bushels of barley, 31,500 bushels of oats, and 2,450 bushels of buckwheat, of which amount there were grown in Maine 7,100 bushels of corn, 2,500 bushels of barley, 23,500 bushels of oats, and 2,450 bushels of buckwheat. Nine hands were employed, with wages varying from $1.50 to $2.00 per day, and averaging $1.83.

The value of custom ground grain was $19,200, on which was paid a toll of $1,360. The value of grain purchased was $64,675, worth $69,900 when manufactured. The total value of products was $90,460.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" four proprietors answered, more than formerly; and one answered, about the same. One proprietor answered that there is more mixed grain raised, also more sweet corn.

Piscataquis county has a land area of 3,772 square miles. It has within its limits the most elevated land in Maine, Mount Katahdin rising to a height of 5,385 feet, and many others several hundred feet above the surrounding regions. The average altitude of the surface of the county above the sea is upwards of 1,200 feet. There is probably no other tract of land of equal area in the world having so many lakes and ponds. A great portion of the county is still covered with forests. The Piscataquis river flows for nearly its whole length in this county and the valley of this river is one of the best agricultural sections of the State. All the cereals can be raised in this valley.

There are extensive slate quarries in the county, also valuable iron mines, not now worked. Kineo, on Moosehead lake, is a famous summer resort, and the whole county is a favorite resort for hunters and fishermen. Lumbering is one of the chief occupations of the people, although next to Aroostook county, Piscataquis raises more wheat, barley, buckwheat, and mixed grain than any other county in Maine.

Sagadahoc County.

From Sagadahoc county three returns were received, reporting an aggregate value of plants of $11,500. One mill is run by steam, developing 20 horse power; one by electricity, developing 30 horse power; and one by gasoline developing 30 horse power, a total of 80 horse power.

One is a roller mill, and two have runs of stones only. The total equipment of the three mills consists of five pairs of rollers, and two runs of stones. One is a feed mill, and two grind both for feed and family use. One is a proprietary mill, and two both custom and proprietary. Neither mill runs full time.

The amount of grain ground was 59,500 bushels of corn, 1,100 bushels of barley, and 300 bushels of oats, of which amount there were grown in Maine 500 bushels of corn, 100 bushels of barley, and 100 bushels of oats. In one mill the proprietor did his own work. In the other two mills 4 hands were employed, with wages varying from $1.50 to $2.00 per day, and averaging $1.75.

Grain to the value of $650 was custom ground, for which a toll of $50 was paid. The cash value of grain purchased was $37,225, worth $39,650 when manufactured. The total value of products was $40,350.

In answer to the question, "Are the farmers in your vicinity raising more corn and grain than formerly?" one mill owner answered that they are raising more, and two answered that they are raising less.

Sagadahoc county is small in land area, containing only 260 square miles. It is situated upon the lower portions of the Kennebec and Androscoggin rivers. The county is remarkable for the number of its streams, bays and coves, and three of its towns, Arrowsic, Perkins and Georgetown are islands. Summer tourists are beginning to appreciate the advantages of this county, especially at Popham beach and Smallpoint, and many fine cottages are already erected. Sagadahoc is the shipbuilding county of the State, and the output of the shipyards of Bath is known the world over.

The surface of the county is much broken, although there are no high eminences. The soil near the coast is thin, but there are fine agricultural towns in the county, and a fair amount of all the cereals are grown. Both soil and climate are adapted

to raising all kinds of agricultural products, but more especially fruits, berries and vegetables. Lumber manufacturing, shipbuilding and the fisheries, aside from agriculture, are the principal occupations.

Somerset County.

From Somerset county eight returns were received, reporting an aggregate value of plants of $46,200. Six mills are run by water, developing 278 horse power; and two by electricity, developing 70 horse power, a total of 348 horse power.

One is a roller mill, six have runs of stones only, and one uses both rollers and stones. The total equipment of the eight mills consists of 8 pairs of rollers, and 20 runs of stones. Two are feed mills, and six grind both for feed and family use. Two are custom mills, one proprietary, and five both custom and proprietary. Six run constantly, and two only a part of the time.

The amount of grain ground was 217,000 bushels of corn, 800 bushels of wheat, 650 bushels of rye, 5,800 bushels of barley, 44,000 bushels of oats, and 6,400 bushels of buckwheat, of which amount there were grown in Maine 15,500 bushels of corn, 50 bushels of wheat, 90 bushels of rye, 2,500 bushels of barley, 22,000 bushels of oats, and 6,400 bushels of buckwheat. In one mill the work was done by the proprietor. In the other seven 16 hands were employed, with wages varying from $1.50 to $2.00 per day, and averaging $1.94.

The value of custom ground grain was $11,800, from which a toll of $1,025 was received. The cash value of grain purchased was $166,111, worth $177,700 when manufactured. The total value of products was $190,525.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" three answered, yes; two answered, no; one answered, about the same; and one answered that the farmers are trying to raise as much. One mill owner said he bought 42,000 bushels of corn, and 10,000 bushels of oats in the West, but always bought all the home grain he could. He said we send too much money out West, and thought farmers should use more labor saving machinery.

Somerset county has a land area of 3,644 square miles. It is about 135 miles in length, north and south, and averages

about 30 miles in width. Moose river, with its wonderful chain of ponds, lies almost wholly in this county, and the Kennebec river flows for nearly half its length in Somerset county. There are several lofty mountain peaks in the county, the highest being Mount Bigelow. Some of the other mountains are Spencer, Bald and Moxie.

The Kennebec river furnishes excellent water powers at Skowhegan, and here we find a woolen mill and several pulp and lumber mills. The chief industry of this county is agriculture, for which both soil and climate are well adapted. The town of Madison, on the Kennebec river, has several woolen mills, and a large pulp mill, and the great water power at that point is being utilized in the establishment of important industries. The county is probably, next to Aroostook, one of the best agricultural counties in the State.

Waldo County.

From Waldo county five returns were received, reporting an aggregate value of plants of $4,400. Four mills are run by water, developing 120 horse power; and one by steam, developing 20 horse power, a total of 140 horse power.

Four mills have runs of stones only, and one runs both rollers and stones. The total equipment of the five mills consists of 2 pairs of rollers, and 7 runs of stones. Three are feed mills, and two grind both for feed and family use. Two are custom mills, two are proprietary, and one is both custom and proprietary. They run only a part of the time.

The amount of grain ground was 39,900 bushels of corn, 275 bushels of barley, 2,400 bushels of oats, and 25 bushels of buckwheat, of which amount there were grown in Maine 275 bushels of barley, 1,900 bushels of oats, and 25 bushels of buckwheat. In three of the mills the proprietors did their own work. In the other mills 2 hands were employed, with wages varying from $1.40 to $1.75 per day, and averaging $1.58.

The value of custom ground grain was $6,060, from which a toll of $383 was received. The cash value of grain purchased was $20,900, worth $22,900 when manufactured. The total value of products was $29,343.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" two mill owners answered, yes; two answered that they cannot tell; and one answered that farmers raise no grain to grind.

Waldo county contains 705 square miles of land area. It is situated on the western shore of Penobscot river and bay, and has several good harbors open all the year. The surface of the county is much broken and there are several high elevations of land, notably Mount Waldo, and Mosquito mountain. These two mountains are composed of fine granite and form two of the best granite quarries in the State. Hundreds of men are employed here in the granite industry.

There are no great water powers in the county, hence no great manufactories. The soil is fertile and adapted to the raising of all the cereals, fruits, berries and vegetables. Agriculture is one of the leading industries and might be carried on much more extensively than now.

Washington County.

From Washington county six returns were received, reporting an aggregate value of plants of $18,500. Three mills are run by water, developing 155 horse power; and three by steam, developing 60 horse power, a total of 215 horse power.

Two are roller mills, three have runs of stones only, and one uses both rollers and stones. The total equipment of the six mills consists of 9 pairs of rollers, and 5 runs of stones. Two are feed mills, and four grind both for feed and family use. Five are proprietary mills, and one both custom and proprietary. One runs constantly, and five only a part of the time.

The amount of grain ground was 143,000 bushels of corn, 1,200 bushels of barley, 3,500 bushels of oats, and 3,000 bushels of buckwheat, of which amount there were grown in Maine 1,200 bushels of barley, 1,000 bushels of oats, and 3,000 bushels of buckwheat. In the six mills 10 hands were employed, with wages varying from $1.25 to $2.00 per day, and averaging $1.53.

Grain to the value of $2,750 was custom ground, for which a toll of $230 was paid. The cash value of grain purchased was $91,750, worth $99,360 when manufactured. The total value of products was $102,340.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" four mill owners

answered, not so much as formerly; and two answered that they did not know.

Washington county has a land area of 2,452 square miles. It has more miles of seacoast than any other county in the State, abounding in bays and inlets which afford excellent harbors. There are several rivers in the county, of which the St. Croix, Narraguagus, Pleasant, East and West Machias, and Dennys, are the most important. The county has no high elevations of land, but abounds in ridges and low hills. The soil is fertile in the river valleys, and soil and climate are adapted to raising any crops that are grown elsewhere in Maine. There are many fine water powers on the rivers, and lumber manufacture is an important industry. The county has some of the finest red and black granite quarries in the world, and these are worked extensively.

This is the banner county in the United States for the canning of sardines, and this industry gives employment to thousands of men, women and children. The sardine industry has stimulated market gardening in some parts of the county, but there has been a falling off in the production of the cereals in late years.

York County.

From York county three returns were received, reporting an aggregate value of plants of $17,000. One mill is run by water, developing 75 horse power; and two by electricity, developing 40 horse power, a total of 115 horse power.

Two mills have runs of stones, and one has rollers and a disc mill. The total equipment of the three mills consists of 5 runs of stones, 1 pair of rollers, and a disc mill. One is a feed mill, and two grind both for feed and family use. Two are proprietary mills, and one both custom and proprietary. They run only a part of the time.

The amount of grain ground was 66,000 bushels of corn, 70 bushels of wheat, 60 bushels of rye, and 4,650 bushels of oats, none of which was grown in Maine. In the three mills 10 hands were employed, with wages varying from $1.50 to $1.67 per day, and averaging $1.59.

Grain to the value of $2,000 was custom ground, for which a toll of $154 was paid. The cash value of grain purchased

was $43,225, worth $49,850 when manufactured. The total value of products was $52,004.

In answer to the question, "Are the farmers in your vicinity raising more grain and corn than formerly?" one mill owner answered, not so much; one answered, about the same; and one thinks they are raising more.

York county has a land area of 920 square miles. It lies in the southwestern part of Maine, and has the most temperate climate of any section of the State. There are several high elevations of land, of which Mount Agamenticus is the most noted. The soil near the coast is somewhat sandy, but is more fertile inland. A portion of the county has considerable pine growth. There are more sea beaches along the coast than in any other section, the best known of which are Old Orchard, Wells, and York. These beaches are much frequented during the summer by tourists, and the numerous hotels and cottages furnish fine markets for the products of farmers in the vicinity. Hence market gardening has received quite an impetus in this county within a few years, and the attention of farmers will probably be directed more and more towards poultry raising, market gardening, and the raising of fruit.

The town of Sanford, on the Mousam river, is a large manufacturing center, and the plush mills there are noted for their fine product. Biddeford and Saco, on the Saco river, have large cotton mills, and are prosperous and growing cities.

GENERAL SUMMARY.

From the sixteen counties of the State ninety-two returns were received, reporting an aggregate value of plants of $418,975. Forty-six mills are run by water, developing 1,979 horse power; seventeen by steam, developing 418 horse power; eleven by electricity, developing 335 horse power; nine by gasoline, developing 198 horse power; six by water and steam, developing 310 horse power; two by water and electricity, developing 160 horse power; and one by water and gasoline, developing 50 horse power, a total of 3,450 horse power.

Of the ninety-two mills reporting, twenty-two are roller mills, forty-eight have runs of stones only, seventeen use both rollers and stones, two use both stones and corn and cob crushers, two

use rollers and disc mills, and one has an attrition mill in addition to runs of stones. The total equipment of the ninety-two mills consists of 166 pairs of rollers, 119 runs of stones, 2 corn and cob crushers, 2 disc mills, and 1 attrition mill. Thirty are feed mills, and sixty-two grind both for feed and family use. Sixteen are custom mills, forty-one are proprietary, and thirty-five both custom and proprietary. Thirty-eight are in constant operation, while fifty-four run only a part of the time.

The amount of grain ground was 2,638,650 bushels of corn, 84,218 bushels of wheat, 4,570 bushels of rye, 28,595 bushels of barley, 386,443 bushels of oats, and 81,009 bushels of buckwheat, a total of 3,223,485 bushels. Of the above amount there were grown in Maine 49,049 bushels of corn, 79,748 bushels of wheat, 1,225 bushels of rye, 23,295 bushels of barley, 101,523 bushels of oats, and 81,009 bushels of buckwheat, a total of 335,849 bushels, showing the great bulk of grain ground, or 2,887,636 bushels, was brought into the State.

In nineteen mills the proprietors did their own work. In the other seventy-three mills 178 hands were employed, with wages varying from $1.25 to $2.25 per day, and averaging $1.76. The value of custom ground grain was $234,941, on which a toll of $17,690 was paid. The value of grain purchased was $1,810,707, worth $1,954,218 when manufactured. The total value of products was $2,206,849.

In answer to the question, "Are farmers in your vicinity raising more grain and corn than formerly?" mill owners differed materially in their opinions, but a larger number answered that farmers are raising less grain and corn than formerly, than those that answered that they are raising more.

It must be kept in mind that the above is not a complete census of the milling business of Maine. It includes only 92 plants, whereas the census of 1900 gave the number of grist mills in the State as 227, but these 92 mills are doing two-thirds of the milling, while the 135 mills not heard from are doing only one-third.

An analysis of the figures will show some interesting facts. Of the 198,392 bushels of wheat, rye, barley and buckwheat ground, 185,277 bushels, or 93 per cent, were raised in Maine; of the 386,443 bushels of oats ground, 101,523 bushels, or 26 per cent, were raised in Maine; and of the 2,638,650 bushels of corn

ground, only 49,049 bushels, or less than 2 per cent, were raised in Maine.

Of the 84,218 bushels of wheat ground, 79,218 bushels, or 94 per cent, were raised in Aroostook county; of the 4,500 bushels of rye ground, 1,000 bushels, or 22 per cent, were raised in Aroostook county; of the 28,595 bushels of barley ground 11,000 bushels, or 38 per cent, were raised in Aroostook county; and of the 81,009 bushels of buckwheat ground, 63,590 bushels, or 78 per cent, were raised in Aroostook county. Of the 185,277 bushels of wheat, rye, barley and buckwheat reported raised in Maine, 153,808 bushels, or 83 per cent, were raised in Aroostook county.

From the above it is evident that nearly all the corn and about three-quarters of the oats ground in Maine mills are raised outside of the State, and that nearly all the other cereals ground were raised in Maine.

There were raised in Maine 296,259 bushels of wheat in 1849; 233,876 bushels in 1859; 278,793 bushels in 1869; 665,714 bushels in 1879; 79,826 bushels in 1889; 116,720 bushels in 1899; 177,314 bushels in 1901; and 207,366 bushels in 1903. It wll be seen by the above that the crop of 1879 was more than double that of any other year reported, being equivalent to a little more than one bushel to an inhabitant of the State; while the smallest crop reported was in 1889, which amounted to less than one-eighth of a bushel to an inhabitant. In very recent years the increase has been steady, but the increase has been mostly in Aroostook county.

The yield of wheat per acre in Maine in 1903 was 25.5 bushels, against 12.3 bushels for the whole country, and for the last ten years the average for Maine has been 21.5 bushels, against 13.4 bushels in the whole country. No section, except a few of the Rocky Mountain states, produces so large a yield per acre as Maine. The value of the crop per acre in Maine in 1903 was $24.99, against $8.96 for the whole country, and the average for Maine during the last ten years has been $19.52, against $8.44 for the whole country. Looking at the above facts from one standpoint it would seem that Maine ought to become a great wheat producing state, but the cost of fertilizers for our wheat lands undoubtedly reduces the net value of the crop to such an extent as to make it unprofitable, except in certain fav-

ored localities; and when we consider that the average value of an acre of potatoes for the last ten years was $71.00, compared with $19.52 for an acre of wheat, it is very evident that potatoes will be exported from the State and flour imported, for generations to come.

The outlook for grain growing in Maine is not flattering. Not more than one-fourth the amount of corn of fifty years ago is being raised at the present time; wheat is only a fraction of what it was formerly; rye has almost disappeared as a farm crop; barley is gradually decreasing; buckwheat is just about holding its own, and only oats show anything like a substantial increase.

Another thing which is acting against the milling industry in Maine is that large quantities of meal are now being imported from the West, instead of whole corn as formerly.

THE GRAIN CROP OF MAINE BY COUNTIES, 1899.

The following table shows the amount of the different kinds of grain raised in the several counties of Maine, in 1899.

Counties.	Barley.	Buckwheat.	Corn.	Oats.	Rye.	Wheat.
Androscoggin	3,910	330	42,520	53,170	390	140
Aroostook	59,990	385,370	810	1,807,435	4,990	99,090
Cumberland	3,300	340	47,620	49,560	470	380
Franklin	9,290	3,050	45,800	100,790	30	850
Hancock	8,420	130	3,400	55,270	240	700
Kennebec	32,780	1,810	108,550	261,760	260	1,300
Knox	5,930	220	6,950	17,650	180	450
Lincoln	16,040	40	10,710	44,270	260	370
Oxford	1,220	3,950	89,550	87,020	450	390
Penobscot	49,730	30,460	52,310	528,270	640	8,380
Piscataquis	13,380	8,720	23,120	155,390	60	920
Sagadahoc	4,420	170	6,520	24,900	80	130
Somerset	11,580	26,910	75,550	357,200	400	1,180
Waldo	24,720	1,520	37,490	188,600	100	1,260
Washington	5,640	5,140	1,540	53,310	150	740
York	2,500	160	92,600	14,840	530	440
Total	252,850	468,320	645,040	3,799,435	9,296	116,720

From the above table we find that practically one-half the grain grown in Maine in 1899, the latest available figures by counties, was raised in the county of Aroostook. With the exception of oats, which are mostly fed whole, there were but 1,492,220 bushels of grain raised in the State, and of this amount, 645,040 bushels, or 43 per cent, was corn, while 847,180 bushels, or 57

per cent, comprised the wheat, rye, barley and buckwheat. More than one-half the barley was raised in the counties of Aroostook, Penobscot and Kennebec, and very little in the western counties of Cumberland, York and Oxford.

Of the total amount of buckwheat, Aroostook county raised about five-sixths, or to be exact, 83.7 per cent. Penobscot and Somerset being the only other counties where any considerable amounts were grown. The growing of corn was fairly well scattered in all the counties except Aroostook and Washington. Kennebec, York, Oxford and Somerset were the leading counties in the production of this crop.

Of oats, Aroostook produced nearly one-half, while Penobscot, Somerset and Kennebec raised fairly large amounts. Of rye, very little was raised, more than one-half growing in Aroostook county, no other county producing more than a few hundred bushels. Aroostook produced six-sevenths of the wheat and Penobscot one-half of the other seventh.

PRESENT CONDITION OF THE MILLING INDUSTRY.

As has been before stated the milling industry has undergone great changes during the last century, and changes are continually taking place. A hundred years ago the people of Maine were mostly farmers. The State was but little settled, and as the pioneers pushed further into the wilderness and cleared new farms they found the land productive, so much so that several crops of corn and grain could be raised without fertilizers before seeding to grass. As a result every farmer in the new settlements had a large amount of grain to grind, and, as a matter of course, grist mills flourished in every section. But when the farm was all cleared and the owner had to depend upon plowed fields for his crops, he found that in order to raise grain he must have fertilizers. His barnyard afforded only a limited amount of dressing and he soon realized that where he had formerly raised ten acres of wheat, a single acre was all he could grow under the changed conditions, and the value of the crop would not warrant the purchase of commercial fertilizers.

With the available farm lands practically all cleared, except in the northern part of the State, we find comparatively little grain raised except in Aroostook county, and this condition must

continue to exist. The farmer must, and has, found more profitable crops to raise and better lines of agriculture to follow. Potato raising, orcharding, dairying, sweet corn raising, market gardening and poultry raising have taken the place of the raising of grain.

There is no doubt of the fact that our breadstuffs and feedstuffs can be brought from the West and sold at a profit and for less money than they can be produced in most parts of Maine. We must accept the situation. We cannot afford, out of sentiment, to always do as our grandfathers did. The greater part of the wayside gristmills must disappear or be diverted to other uses, as they have been disappearing in the older settled parts of the State for a hundred years or more.

To sum up the whole matter, rural grist mills are flourishing only in the northern counties where new land is being cleared, the only exception on any extended scale being in Aroostook county on the potato lands along the fertile river valleys where quite large quantities of wheat are raised in the rotation of crops. Aside from this are the large amounts of corn ground at distributing points in our wholesale trade, and even this field is, to a certain extent, being invaded by the importation of ground meal and feed stuffs.

CENTRAL ELECTRIC LIGHT AND POWER STATIONS.

Central electric stations supply current for motive power for running street railway cars, manufacturing plants and elevators; also current for lighting streets, parks, tunnels, business places and private dwellings; for charging batteries, and for heating purposes. In addition to central electric stations there are light and power stations operated by electric railway companies, also private electric plants operated to furnish light or power for the business of the owner.

Electric arc lamps were first used commercially, to a limited extent, in 1876, but the first central electric light station supplying current to such lamps was not installed until 1879. Incandescent lamps were introduced commercially during 1880 and 1881, and the first station commenced operations in 1882.

The industry had not developed sufficiently to be enumerated in the census of 1880. The first information appeared in the census of 1890, but the statistics were presented for only a few places, so that no comparisons can be made to show the growth of the industry in the entire country.

At the time of making the latest investigation of electric light and power plants in 1902, electricity had been used commercially for light and power purposes only twenty-three years, yet during this comparatively short period the industry had outstripped many other industries of importance in the country which were much older. The urban population is now largely dependent upon it for transportation facilities, artificial light, and power for manufacturing purposes.

Central electric stations have become active competitors for purposes of illumination with plants for the manufacture of gas, but this competition has been neutralized to some extent by the control which, in many instances, gas companies have secured over competing electric stations. Yet, notwithstanding this, and also the fact that the gas industry in this country dates

from 1806, while electric stations have been in existence only since 1879, the latter industry is becoming by far the more important.

The State of Maine, with its magnificent water powers and its wealth of raw material for manufacture, is rapidly utilizing this new motive power, and already electricity is fast superseding steam for manufacturing purposes. It has very nearly eliminated the horse from street railways, it has, to a large extent, superseded gas for illuminating purposes, it is used somewhat for heating purposes, and its uses in various ways are multiplying daily. No one would dare to predict the future uses of electricity, but that it will soon replace steam as a motive power is the belief of many practical railroad men and engineers.

QUESTIONS SENT TO ELECTRIC COMPANIES.

In order to proceed systematically in the investigation of central electric light and power stations in Maine, the following questions were printed on the official blanks of the Bureau of Industrial and Labor Statistics and sent to the different managers.

(Electric Light and Power Plants.)

1. Location and title of station and plant.....
2. Capital stock authorized.....
3. Kind of power used for generating electricity, water, steam or both combined.....
4. Number of water wheels in use.....Total horse power of same.....
5. Number of steam engines.....Total horse power of same.....
6. Do you generate electricity for lighting streets.....business places.....residences.....
7. Do you furnish electric power for propelling street cars .....for running mills or manufacturing plants..... for elevators.....
8. For what cities or villages do you furnish electricity for lighting.....number of arc lights..... incandescent lights.....number of miles of wire.....
9. For how many miles of electric road do you furnish power....for how many and what kind of manufactories.....

10. What is the value of your station or plant.....

11. What was the cost of material used during your last fiscal year, exclusive of labor.....

12. What was the income of your plant or station during your last fiscal year.....

13. What classes of employes have you, how many of each class, and daily wages of each class.....

Managers and proprietors of electric stations responded promptly and in most cases satisfactorily to these questions, and we are enabled to present a very full account of the central electric light and power stations of the State.

LIST OF CENTRAL ELECTRIC LIGHT AND POWER STATIONS IN MAINE.

The electric plants that come under the definition of central electric light and power stations are as follows:

Private Ownership.

Auburn; Lewiston and Auburn Electric Light Company.

Augusta, Gardiner and Hallowell; Kennebec Light and Heat Company.

Bangor; Public Works Company.

Bar Harbor; Bar Harbor Electric Light Company.

Bath; Sagadahoc Light and Power Company.

Belfast; Belfast Gas and Electric Company.

Bethel; Bethel Light Company.

Biddeford; York Light and Heat Company.

Boothbay Harbor; Boothbay Harbor Electric Light and Power Company.

Bridgton; Bridgton Water and Electric Company.

Brownville; Brownville Electric Light and Power Company.

Brunswick; Brunswick Electric Light and Power Company.

Bucksport; Bucksport Light and Power Company.

Calais; St. Croix Gas Light Company.

Caribou; Caribou Water, Light and Power Company.

Crerryfield; Cherryfield Electric Light Company.

Corinna; Corinna Electric Light Company.

Dexter; Dexter Electric Light and Power Company.

Dover; Dover and Foxcroft Light and Heat Company.

Eastport; Eastport Electric Light Company.
Ellsworth; Ellsworth Water Company.
Farmington; Farmington Electric Light Company.
Fort Fairfield; Stevens Electric Company.
Freeport; Freeport Electric Light, Heat and Power Company.
Fryeburg; Fryeburg Electric Light Company.
Guilford; Piscataquis Woolen Company.
Houlton; Houlton Electric Company.
Houlton; Houlton Incandescent Light Company.
Kennebunkport; Kennebunk Electric Light Company.
Kingfield; Huse Spool and Bobbin Company.
Livermore Falls; Livermore Falls Light and Power Company.
Machias; Machias Electric Light Company.
Mechanic Falls; Mechanic Falls Water, Electric Light and Power Company.
North New Portland; C. H. Bartlett.
Norway; Oxford Light Company.
Oakland and Waterville; Oakland Electric Company.
Old Town; Old Town Electric Company.
Phillips; Phillips Electric Light and Power Company.
Pittsfield; Pittsfield Electric Light and Power Company.
Portland; Consolidated Electric Light Company of Maine.
Portland; Portland Lighting and Power Company.
Presque Isle; Presque Isle Electric Light Company.
Rumford Falls; Rumford Falls Light and Water Company.
Sanford; Sanford Light and Power Company.
Skowhegan; Skowhegan Electric Light Company.
Sorrento; Sorrento Electric Light Company.
South Berwick; Berwick and Salmon Falls Electric Company.
Waterville; Union Gas and Electric Company.
Westbrook; Westbrook Electric Light and Power Company.
Yarmouth; Yarmouth Manufacturing Company.
York; Agamenticus Light and Power Company.

Municipal Ownership.

Bangor; city of Bangor.
Kennebunk; town of Kennebunk.
Lewiston; city of Lewiston.

In the above list are found 51 stations under private ownership, and 3 stations under municipal ownership, a total of 54.

SUMMARY OF RETURNS BY COUNTIES.

In the following pages a summary of the returns of electric light and power stations in Maine is presented by counties.

Androscoggin County.

There are four central electric light and power stations in Androscoggin county, namely, the Lewiston Street Lighting Department, Lewiston; the Livermore Falls Light and Power Company, Livermore Falls; the Mechanic Falls Water and Electric Light and Power Company, Mechanic Falls; and the Lewiston and Auburn Electric Light Company, Auburn.

Three plants report an aggregate capital stock of $265,000. Three use water for motive power, and one both water and steam. The motive equipment of the four plants consists of 10 water wheels, developing 3,740 horse power, and one steam engine, developing 100 horse power, a total of 3,840 horse power.

Three plants generate electricity for lighting streets, residences and business places, and one for lighting streets only; the cities and villages lighted being Auburn, Lewiston, Chisholm, Hebron, Livermore Falls, Mechanic Falls, Oxford and Welchville. One plant reports 190 arc lights, and one reports 6,000 incandescent lights. Two plants furnish power for running 2 machine shops, 1 basket shop, 1 pumping station, 1 sawmill, 1 foundry, 1 grist mill, and 1 printing plant, and one furnishes power for running elevators.

Two report an aggregate value of plants of $129,450. One gives the cost of materials used during the last fiscal year as $2,000, and one the gross income as $7,364. Three report an aggregate of 110 miles of wire. Three report 14 employes, designated as superintendents, linemen, stationmen and trimmers, with wages varying from $1.50 to $3.25 per day, according to the skill and position of the workmen.

Aroostook County.

There are five central electric light and power stations in Aroostook county, namely, the Caribou Water, Light and Power Company, Caribou; the Stevens Electric Company, Fort Fairfield; the Houlton Electric Company, Houlton; the Houlton Incandescent Light Company, Houlton; and the Presque Isle

Electric Light Company, Presque Isle. The Bureau failed to receive a return from the Houlton Electric Company, therefore our figures are made up from four stations.

Two plants report an aggregate capital stock of $60,000. One uses steam for motive power, and three both water and steam. The motive equipment of the four plants consists of 5 water wheels, developing 675 horse power, and 6 steam engines, developing 650 horse power, a total of 1,325 horse power.

Three plants generate electricity for lighting streets, residences and business places, and one for lighting residences and business places only, the villages lighted being Caribou, Fort Fairfield, Houlton and Presque Isle. The four plants report 79 arc lights, and 10,800 incandescent lights. Three furnish no power, while one furnishes power for running 2 grist mills and 2 starch factories.

Three report an aggregate value of plants of $102,000; cost of materials during the last fiscal year, $5,875; and aggregate income, $20,000. Three report 16 miles of wire. The four plants employ 15 hands, with daily wages varying from $2.00 to $2.50 per day, and from $40 to $70 when paid by the month.

Cumberland County.

There are seven central electric light and power stations in Cumberland county, namely, the Bridgton Water and Electric Company, Bridgton; the Brunswick Electric Light and Power Company, Brunswick; the Freeport Electric Light, Heat and Power Company, Freeport; the Portland Lighting and Power Company, Portland; the Consolidated Electric Light Company of Maine, Portland; the Westbrook Electric Light and Power Company, Westbrook; and the Yarmouth Manufacturing Company, Yarmouth. No return was received from the latter plant. The Westbrook plant is not a separate corporation, but is a part of the great S. D. Warren manufacturing plant, and sells current in that community.

Five plants report an aggregate capital stock of $1,150,000. One uses water for motive power, two use steam, and three both water and steam. The motive equipment of the six plants consists of 13 water wheels, developing 4,750 horse power, and 18 steam engines, developing 4,250 horse power, a total of 9,000 horse power.

All the plants generate electricity for lighting residences and business places, and five for lighting streets; the cities and villages lighted being Portland, South Portland, Westbrook, Bridgton, Brunswick, Falmouth, Freeport, Gorham, South Freeport, Topsham and Yarmouth. Three plants furnish power for running elevators, and five for running manufacturing plants, including grist mills, structural iron works, lumber mills, wood working shops, printing offices, clothing shops, shoe factories, machine shops, foundries, brickyards, paper mills, besides a large number of miscellaneous mills and shops, the number of each not always given in detail, but amounting in the aggregate to nearly 100. Four plants report 697 arc lights, and five report 86,442 incandescent lights.

Three report an aggregate value of plants of $151,000. Four report the cost of materials used during the last fiscal year as $63,932, and the gross income as $227,828. Three report 343½ miles of wire. Five report 84 hands employed. Men by the day receive from $1.50 to $3.25. Some work by the month with wages varying from $55 to $100, while some skilled electricians, in certain positions, receive as high as $1,500 yearly salary.

Franklin County.

There are three central electric light and power stations in Franklin county, namely, the Farmington Electric Company, Farmington; the Huse Spool and Bobbin Company, Kingfield; and the Phillips Electric Light and Power Company, Phillips. The treasurer of one of the companies, in reply to the blank and letter sent out, writes that the plant has been in the hands of the present owners for so short a time that they are unable to give satisfactory answers to the questions; therefore the figures, as given for this county, relate to two plants only.

The two plants report an aggregate capital stock of $60,000. One uses steam for motive power, and one both water and steam. The motive equipment of the two plants consists of 1 water wheel, developing 80 horse power, and two steam engines, developing 155 horse power, a total of 235 horse power.

Both plants generate electricity for lighting streets, residences and business places; the villages lighted being Farmington, Kingfield and Phillips. The number of incandescent lights reported is 1,400.

The value of plants is $11,000; the cost of materials used during the last fiscal year, $1,750; gross income, $3,649; miles of wire in use, 10. Number of hands employed, 4, with wages varying from $150 to $2.00 per day.

Hancock County.

There are four central electric light and power plants in Hancock county, namely, the Sorrento Electric Light Company, Sorrento; the Bucksport Light and Power Company, Bucksport; the Ellsworth Water Company, Ellsworth; and the Bar Harbor Electric Light Company, Bar Harbor. The Sorrento plant only lights the hotel and a few cottages at that place and the manager considered it of too little consequence to give definite figures, so our calculations are based on the returns from three plants.

Three plants report an aggregate capital stock of $164,650. Two use steam for motive power, and one both water and steam. The motive equipment of the three plants consists of 1 water wheel, developing 150 horse power, and 5 steam engines, developing 1,175 horse power, a total of 1,325 horse power.

The three plants all generate electricity for lighting streets, residences and business places, the cities and villages lighted being Ellsworth, Bar Harbor, Bucksport, Ellsworth Falls, North East Harbor, Seal Harbor and Sorrento. Two plants report 120 arc lights, and the three, 20,500 incandescent lights. One furnishes power for running elevators, and two for running manufacturing plants, including 1 lumber mill, 1 planing mill, 1 grist mill, 1 stone polisher, 2 upholstering establishments, 2 carriage factories, 1 rock crusher, 1 coal and wood plant, and 1 ice cream establishment.

One reports the value of plant as $2,500; one the cost of materials used during the last fiscal year, $1,600; and one the gross income, $2,600.

Two report 210 miles of wire. About 20 hands are employed, with wages varying from $1.50 to $3.00 per day.

Kennebec County.

There are three electric light and power stations in Kennebec county, namely, the Kennebec Light and Heat Company, Augusta; the Oakland Electric Company, Oakland; and the Union Gas and Electric Company, Waterville.

The three plants report an aggregate capital stock of $400,000. One uses water for motive power, and two both water and steam. The total motive equipment consists of 10 water wheels, developing 3,300 horse power, and 4 steam engines, developing 1,000 horse power, a total of 4,300 horse power.

Two plants generate electricity for lighting streets, residences and business places, and one for residences and business places only; the cities and villages lighted being Augusta, Gardiner, Hallowell, Waterville, Oakland and Winslow. The three plants report 199 arc lights, and 22,000 incandescent lights. One plant furnishes power for running 5 elevators, and the three furnish power for running 27 industrial plants, including 8 printing establishments, 1 pulp mill, 2 woolen mills, 2 scythe factories, 1 clothes manufactory, 1 roller mill, car repair shops, etc.

Two report an aggregate value of plants of $118,000; cost of materials used during the last fiscal year, $5,307; gross income, $28,084; and the three report 124 miles of wire. Information in regard to hands employed and wages paid is very meagre, one reporting 5 hands, and another wages at $2.00 per day.

Knox County.

Knox county has no distinctive electric light and power station, but Rockland, Camden, Rockport and Thomaston are lighted from the power house of the Rockland, Thomaston and Camden Street Railway. This plant also furnishes power for running manufactories of various kinds, and current for lighting public buildings, business houses and residences. Steam power is used in generating electricity.

Lincoln, Sagadahoc and Waldo Counties.

The above named counties have but one electric light and power plant each, hence we give the consolidated figures for the three counties in order to avoid giving the detailed business of

either. They are the Boothbay Harbor Electric Light and Power Company, Boothbay Harbor, Lincoln County; the Sagadahoc Light and Power Company, Bath, Sagadahoc county; and the Belfast Gas and Electric Company, Belfast, Waldo county.

The three plants report an aggregate capital stock of $350,000. Two use steam for motive power, and one both water and steam. The motive equipment of the three plants consists of 2 water wheels, developing 150 horse power, and 7 steam engines, developing 1,675 horse power, a total of 1,825 horse power.

All generate electricity for lighting streets, residences and business places; the cities and villages lighted being Bath, Belfast, Boothbay and Boothbay Harbor. Two plants report 83 arc lights, and one reports 2,000 incandescent lights. One furnishes power for running street cars and manufacturing plants, one for manufacturing plants only, and one for manufacturing plants and elevators. The manufacturing plants for which power is furnished include machine shops, ship yards, sardine factories, etc.

Two report an aggregate value of plants of $100,000. One reports the cost of materials used during the last fiscal year as $2,500, and two report a gross income of $61,688. Two report an aggregate of 83 miles of wire. The three plants report about 40 employes, with wages varying from $1.50 to $2.00 per day; from $5.00 to $12.00 per week; and from $25.00 to $85.00 per month.

Oxford County.

There are four central electric light and power stations in Oxford county, namely, the Bethel Light Company, Bethel; Fryeburg Electric Light Company, Fryeburg; the Oxford Light Company, Norway; and the Rumford Falls Light and Water Company, Rumford Falls.

The four plants report an aggregate capital stock of $236,000. One uses water for motive power, one uses steam, one both water and steam, and one gasoline. The motive equipment of the four plants consists of 5 water wheels, developing 1,500 horse power; 2 steam engines, developing 430 horse power; and 1 gasoline engine, developing 25 horse power, a total of 1,955 horse power.

Three plants generate electricity for lighting streets, residences and business places, and one for lighting business places

only; the villages lighted being Fryeburg, Mexico, Norway, Rumford Falls and South Paris. Two plants report 71 arc lights, and four report 13,694 incandescent lights. One furnishes power for running street cars, manufacturing plants and elevators, and one for manufacturing plants only, in all 27 plants, including grist mills, lumber mills, planing mills, machine shops, shoe factory, and printing offices.

The four report an aggregate value of plants of $227,500; cost of materials used during the last fiscal year, $7,404; and three report the gross income as $26,113. The four plants report an aggregate of 97½ miles of wire. Two plants report 9 employes, with wages varying from $1.25 to $2.25 per day.

Penobscot County.

Penobscot county had five central electric light and power stations up to July 4th, last, when the Corinna station was destroyed by fire and has not since been rebuilt, namely, the Corinna Electric Light Company, Corinna; the Bangor Electrical Department City of Bangor, Bangor; the Public Works Company, Bangor; Dexter Electric Light and Power Company, Dexter; and the Old Town Electric Company, Old Town.

Three plants report an aggregate capital stock of $648,000. Three use both water and steam for motive power, while one plant purchases power. The motive equipment of three plants consists of 20 water wheels, developing 3,375 horse power, and 5 steam engines, developing 2,332 horse power, a total of 5,707 horse power.

One plant generates electricity for lighting streets, residences and business places, one lights residences and business places, and one lights streets only, while a fourth lights streets, residences and business places with electricity purchased; the cities and villages lighted being Bangor, Brewer, Old Town, Dexter, Great Works, Hampden, Milford, Orono, Stillwater and Veazie. Two plants report 337 arc lights, and four report 33,694 incandescent lights. One plant furnishes power for running 30 miles of street cars, 75 manufacturing plants, and several elevators.

Four report an aggregate value of plants of $447,596. Three give the cost of materials used during the last fiscal year as

$14,769; three the gross income as $243,110; and three report an aggregate of 118¼ miles of wire. Four plants report 150 employes, with wages varying from $1.50 to $2.50 per day.

Piscataquis County.

There are three central electric light and power stations in Piscataquis county, namely, the Brownviile Electric Light and Power Company, Brownville; Dover and Foxcroft Light and Heat Company, Dover; and the Piscataquis Woolen Company, Guilford.

The three plants report an aggregate capital stock of $175,000. One uses water for motive power, and two both water and steam. The motive equipment of the three plants consists of 5 water wheels, developing 476 horse power, and 2 steam engines, developing 275 horse power, a total of 751 horse power.

All generate electricity for lighting streets, residences and business places; the villages lighted being Brownville, Dover, Foxcroft, Guilford and Sangerville. One plant reports 10 arc lights, and two report 4,200 incandescent lights. One furnishes power for manufacturing plants.

The three report an aggregate value of plants of $126,000; and gross income, $12,900. Two plants report cost of materials used during the last fiscal year as $550. Two report an aggregate of 10 miles of wire. The three plants employ 7 hands, with wages varying from $1.55 to $2.50 per day, and from $480 to $800 per year.

Somerset County.

There are three central electric light and power stations in Somerset county, namely, Charles H. Bartlett, North New Portland; Pittsfield Electric Light and Power Company, Pittsfield; Skowhegan Electric Light Company, Skowhegan.

The three plants report an aggregate capital stock of $100,000. One plant uses steam for motive power, and two both water and steam. The motive equipment of the three plants consists of 4 water wheels, developing 645 horse power, and 3 steam engines, developing 745 horse power, a total of 1,390 horse power.

All generate electricity for lighting streets, residences and business places; the villages lighted being Norridgewock, North

New Portland, Pittsfield and Skowhegan. Two plants report 52 arc lights, and three report 7,408 incandescent lights.

The three report an aggregate value of plants of $165,000; gross income, $22,103; and two report the cost of materials used during the last fiscal year as $1,150. They report an aggregate of 61 miles of wire. The three plants employ 11 hands, with wages varying from $1.25 to $2.00 per day.

Washington County.

There are four central electric light and power stations in Washington county, namely, the Cherryfield Electric Light Company, Cherryfield; Eastport Electric Light Company, Eastport; Machias Electric Light Company, Machias; and the St. Croix Gas Light Company, Calais.

The four plants report an aggregate capital stock of $107,000. One uses steam for motive power, and three use both water and steam. The motive equipment of the four plants consists of 4 water wheels, developing 750 horse power, and 5 steam engines, developing 760 horse power, a total of 1,510 horse power.

All generate electricity for lighting streets, residences and business places; the cities and villages lighted being Calais, Eastport, Cherryfield and Machias. Two plants report 140 arc lights, and four report 5,866 incandescent lights. One furnishes power for running manufacturing plants and elevators.

Three report an aggregate value of plants of $90,000; three report the cost of materials used during the last fiscal year, $2,320; and two report the gross income, $6,000. The four plants report an aggregate of 111 miles of wire. Three report 7 employes, with wages varying from $25.00 to $90.00 per month.

York County.

There are six central electric light and power stations in York county, namely, the Agamenticus Light and Power Company, York; Berwick and Salmon Falls Electric Light Company, South Berwick; Kennebunk Electric Light Plant, Kennebunk; Kennebunk Electric Light Company, Kennebunkport; Sanford Light and Power Company, Sanford; and the York Light and Heat Company, Biddeford.

Five plants report an aggregate capital stock of $550,000. Two use water for motive power, three use steam, and one both water and steam. The motive equipment of the six plants consists of 4 water wheels, developing 400 horse power, and 8 steam engines, developing 1,600 horse power, a total of 2,000 horse power.

Four plants generate electricity for lighting streets, residences and business places, one for streets and business places, and one for streets only; the cities and villages lighted being Biddeford, Saco, Kennebunk, Kennebunk Beach, Kennebunkport, Old Orchard, Sanford, South Berwick, Springvale, West Kennebunk, York Beach and York Harbor. Three plants report 178 arc lights, and five report 13,700 incandescent lights. One furnishes power for running elevators, and also manufacturing plants, consisting of grist mills, sawmills, and printing offices.

The six report an aggregate value of plants of $710,985; five give the cost of materials used during the last fiscal year as $32,687; and gross income, $79,637. The six plants report an aggregate of 368 miles of wire. Four report 30 employes, with wages varying from $1.50 to $3.25 per day.

Recapitulation.

In making this investigation we have received reports from 52 out of the 54 private and municipal central electric light and power plants now existing in the State. Two or three reports gave no direct information and several others were more or less defective, so the totals do not represent the full amount of business of all the plants.

Forty-three plants report an authorized capital stock of $4,265,650. Seven plants are run by water, 14 by steam, 24 by water and steam, one by gasoline, and one by power purchased. Forty-six plants report 84 water wheels, developing 19,991 horse power; 68 steam engines, developing 15,147 horse power; and 1 gasoline engine, developing 25 horse power, a total of 35,163 horse power.

Forty-three plants furnish light of streets, 44 for residences, and 46 for business places, lighting 19 cities and 64 villages. Aside from this, Rockland, Camden, Rockport and Thomaston, are lighted by an electric railway plant.

Twenty-eight plants report 2,156 arc lights, and 41 plants report 227,704 incandescent lights. Three plants furnish power for running street cars, 22 for running manufacturing plants, and 16 for running elevators.

Thirty-eight returns give an aggregate value of plants of $2,381,031. Thirty-three returns report $141,844 as the cost of materials used during the last fiscal year. Thirty-four plants report $741,076 as the gross income for the year. Forty returns report 1,662¼ miles of wire. Forty returns report 396 employes.

STREET RAILWAY ELECTRIC POWER PLANTS.

Besides the central electric light and power stations enumerated, there are the great electric power plants of the street railways. Some of these are very extensive and their cost and equipment far exceeds the cost and equipment of an equal number of central electric light and power stations. It must be remembered that these railway plants furnish electric lights for their cars, also for lighting the buildings, parks, etc., owned by the respective companies.

The street railways that own their own power plants are given below, together with the number of miles operated.

Atlantic Shore Line Railway	34.15
Augusta, Winthrop and Gardiner Railway	26.64
Bangor Street Railway, (Public Works Company)	9.06
Benton and Fairfield Railway	4.12
Biddeford and Saco Railroad	7.61
Calais Street Railway	7.00
Lewiston, Brunswick and Bath Street Railway	57.77
Penobscot Central Railway	26.25
Portland and Brunswick Street Railway	15.40
Portsmouth, Dover and York Street Railway	39.76
Portland Railroad	77.82
Rockland, Thomaston and Camden Street Railway	21.07
Skowhegan and Norridgewock Railway	5.75
Waterville and Fairfield Railway and Light Company	4.75
Waterville and Oakland Street Railway	5.75

The following electric railways purchase their power:

Bangor, Hampden and Winterport Railway	4.52
Bangor, Orono and Old Town Railway	16.20

Norway and Paris Street Railway..... 2.13
Somerset Traction Company..... 12.20

The railways that own their power stations are running 342.90 miles of road, and those that purchase power are running 35.05 miles, making a total of 377.95 miles of electric railways in the State.

PRIVATE ELECTRIC PLANTS.

In addition to the central electric light and power stations and the power stations of the various street railway companies, there are a very large number of smaller electric light and power plants scattered throughout the State for private use. Many manufacturers have their own electric plants which light their buildings and also furnish power for running parts of their machinery.

The Great Northern Paper Company at Millinocket has an electric plant that would be sufficient to light any city in the State. From the electricity generated at this plant, not only all the paper machines and some other machinery in the mills are propelled, but the acres of buildings constituting the manufactory, as well as two hotels in the village owned by the company, are lighted.

Many of the wood novelty concerns have their electric lighting apparatus, and it is said that the Willimantic spool manufactory, in the town of Willimantic, Piscataquis county, was the very first manufacturing plant in the State to be lighted by electricity. Even in the cities there are many mills, factories and other establishments that have their electric lighting plants. In the city of Portland, the Young Men's Christian Association building has its lighting plant, as do also the Jefferson theater and many other public and private buildings.

The Poland Spring hotel has an electric plant sufficiently ample to light a small village, and the same might be said of scores of other summer resort houses and hotels in the State. Kineo has its electric plant, and many other isolated hotels are as well lighted from their own electric plants as their kindred hotels in the cities.

The generation of electricity by water power is more economical than by steam, and the time is fast coming when the vast power in the streams and rivers of Maine, now running to waste, will be utilized in generating electricity for lighting and power

purposes. Immense plants like that at Veazie, and the one just completed at Deer rips, Lewiston, will multiply until all the large centers of population in the State will have great central plants from which to draw.

In the mighty water power at Rumford Falls there are said to be 30,000 horse power available but not yet utilized. Undoubtedly the next move in the development of that industrial town will be the construction of the largest electric light and power plant this side of Niagara. There is no state in the Union so amply endowed with water power as our own, and when these powers are utilized in generating electricity, Maine will probably become one of the most prosperous manufacturing states in the Union.

THE ELECTRIC PLANT AT DEER RIPS, LEWISTON.

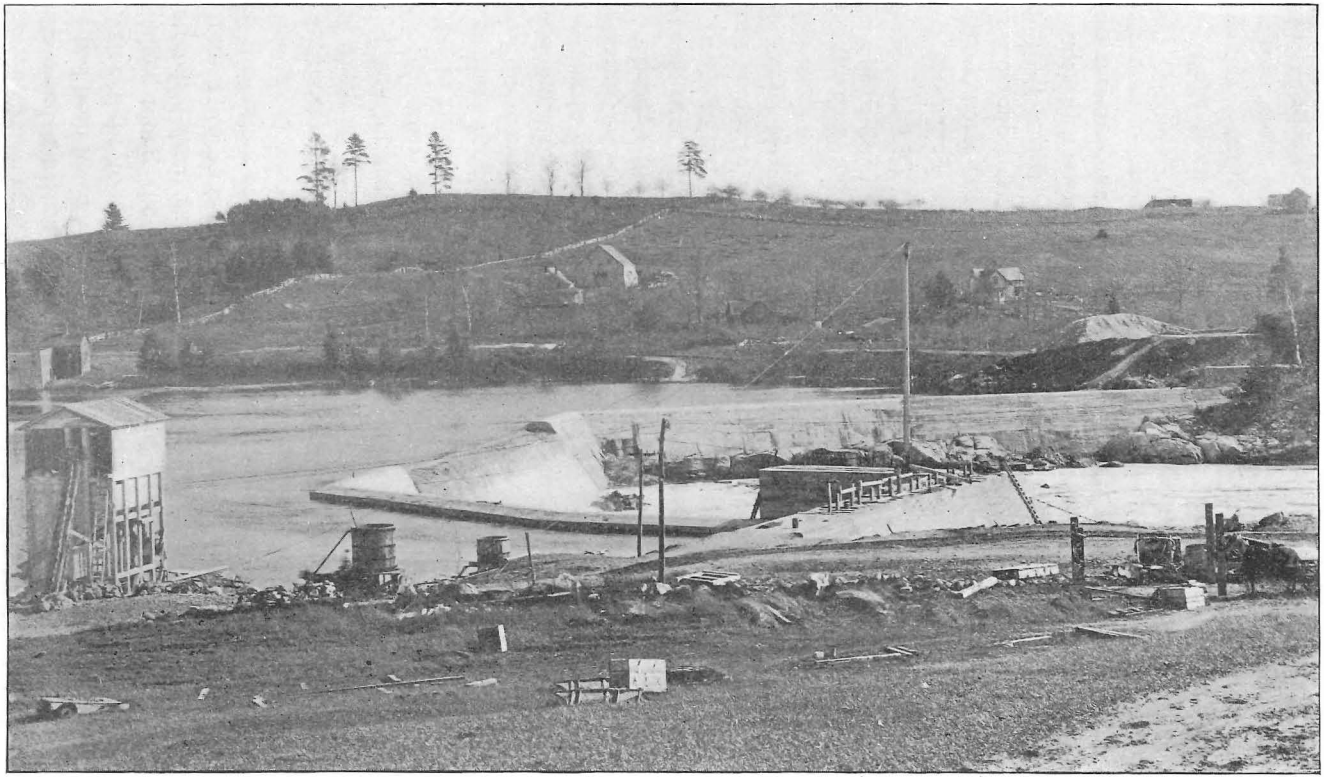
At the rapids in the Androscoggin river known as Deer rips, about two miles above the cities of Lewiston and Auburn, a dam and power house have just been completed, and an electric light and power station installed which, for water power developed to be used wholly for generating electricity, exceeds anything of a like nature in New England.

The work of construction was commenced on April 16, 1902, and the dam, canal and power house were completed and electrical machinery sufficient for present needs installed, so that the works were set in motion on November 12, 1904.

In the prosecution of this enterprise, not only a dam had to be built but a canal of nearly 1,000 feet in length had to be constructed, which for the most part was blasted through solid ledge.

The dam, which is of concrete, is not built directly across the river, but such angles occur in its course as give it the greatest strength. The stone entering into its construction was blasted from the canal, crushed, and mixed in proper proportions with sand and Portland cement, the sand being hauled a distance of two miles. About 40,000 barrels of Portland Cement were used in the construction of the entire plant.

The dam was constructed by dumping the mixed concrete into a mould, or between wooden walls so built up as the work progressed as to give proper shape to the dam, and when the con-



THE DAM AT DEER RIPS.

crete had hardened and become practically a solid mass of stone, the wood work was removed, leaving the whole structure as if it had been hewn out of one immense block of granite, and fitted water tight to every variation on the uneven surface of the ledges along the river bottom and bank connections, as it stretched from shore to shore. The height of the dam varies from 25 to 30 feet on account of the irregularities of the ledge at the bottom of the river. It is built perpendicular on the upper side but slopes on the lower side, being an average of 28 feet in thickness at the base and 9 feet at the top, with an average height of about 28 feet.

The abutments, where the head gates are located at the head of the canal, are built out from the Auburn shore, and are 12 feet in thickness at the top. With the exception of the eight openings for the passage of water into the canal the abutments are one continuous piece of solid concrete masonry. At these openings are adjusted the head gates which are 7 feet wide and 14 feet in height. Directly above is the heavy iron gearing for hoisting and lowering the gates.

Through the section of the dam adjoining these abutments, which here runs at a right angle, or almost directly up stream, are placed the waste gates, the waste water being vented through two immense steel tubes. On account of the greater pressure of water above the head of the canal, both the abutments and the section of dam adjoining are more massive than the rest of the dam, the abutments being heaviest of all.

The entire length of the dam, including abutments, is 1,013 feet. The fall created by the construction of this dam is capable of furnishing, at a normal low water run, between 9,000 and 10,000 horse power.

The upper portion of the inner wall of the canal is of concrete until it strikes the rim of ledge between the canal and river, from which point the canal is far enough from the river to require no retaining wall. Wherever necessary, side dams were constructed to prevent any overflow of the adjoining land, both in the vicinity of the dam and along the line of the canal.

While work on the dam had to be suspended through the winter months and during the high pitch of water in early spring, work on the canal could go on continuously, as it consisted principally of blasting and removing the broken stone.

During the fall of 1903, what is claimed to be the greatest dynamite blast ever fired in the State, occurred in this canal. Three hundred and fifty holes were drilled, each sixteen feet in depth. These holes were charged with 3,000 pounds of dynamite and fired simultaneously with an electric battery. The result of this single blast was to tear and break into fragments the ledge for a distance of 200 feet along the line of the canal, releasing a mass of stone, the removal of which required the work of forty men for nearly three months.

The canal is nearly 1,000 feet in length, 80 feet wide at the top and 25 feet deep, although it widens considerably at the lower end. In excavating this canal 40,000 cubic yards of stone were removed, the larger part of which went into the construction of the dam.

At the lower end of the canal is located the power house which is a structure 136 by 44 feet in size, and 50 feet from the concrete floor to the ceiling. Beneath the floor is a basement 20 feet in depth excavated out of the solid rock, in which are located the water wheels. The piers which support the power house are of concrete and are 20 feet in diameter.

At the power house there are seven gates, each 14 feet wide and 12 feet in height, which admit the water from the canal into the wheel chambers.

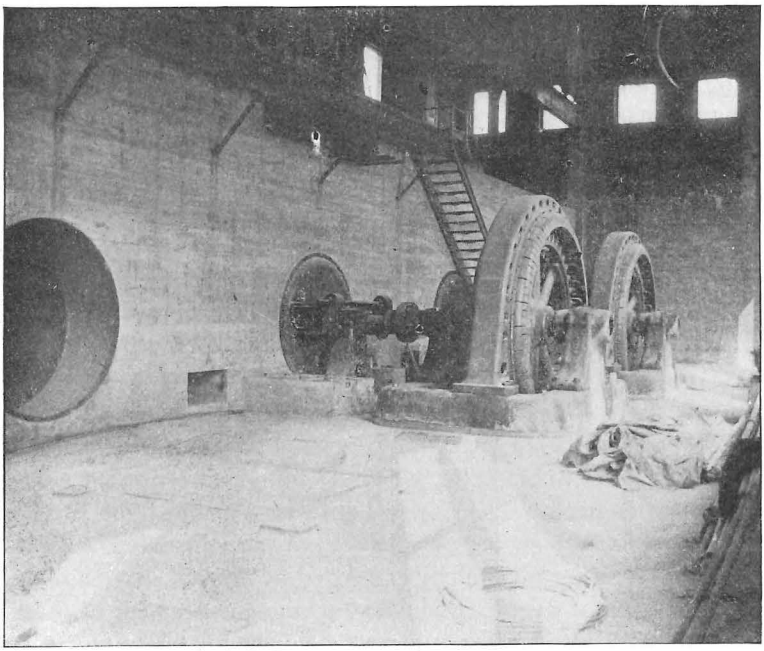
The generators are located on the main floor. These generators are 12 feet in diameter, weigh 41 tons, and represent 1,000 horse power each. The power house was planned for five of these wheels, but so far only two have been installed, as that number furnishes all the power needed at present, but as more power is wanted for new industries or the enlargement of those already established, other generators will be put in as required.

Accompanying each of the generators is a 125 horse power exciter. These exciters are direct current generators which furnish the magnetizing current for the big generators. The electric current is fed from the generators through lead covered cables to the switch board which is located on a gallery on one side of the main room, seventeen feet above the floor. Each of these cables contains three wires carrying a pressure of 10,000 volts. The switch board controls and distributes the current.

This switch board is provided with duplicate switches and duplicate lines of wire between the power house and the sub-

stations, so that if the operating wires become disabled at any time the operator can instantly switch over to the duplicate wires while the damage is being repaired, thus preventing any interruption in the service.

From the power house the line is made up of six aluminum wires which follow down on the Auburn side, spanning the river at the head of the Lewiston falls from the west pitch to the island and thence to the Lewiston shore, where they enter the terminal house or substation. From the terminal house the wires are led



GENERATING ROOM AND POWER HOUSE, DEER RIPS.

to the transformer room in lead covered cables placed in subways.

The transformer room is in the substation of the Lincoln mill, where are located five immense transformers, each with a capacity of 650 horse power, four of which are connected with the circuit. The fifth is held in reserve to be used in case of need. These transformers reduce the pressure from 10,000 down to 2,200 volts, the latter being the distributing voltage of the Lewiston and Auburn Electric Light company.

From the transformer room four immense cables carry the current to the distribution board in the room formerly occupied by the American Light and Power Company, and from the various panels of this board the current is sent in every direction for light and power purposes.

This enterprise has been carried through from its inception by Libby and Dingley, the owners of the Lincoln cotton mill. The construction of the plant required over two and one-half years, with a crew of men averaging about one hundred. The 10,000 horse power now available from the Deer rips dam, added to the splendid power already developed at the Lewiston falls, means much to the cities of Lewiston and Auburn

HEATING AND COOKING BY ELECTRICITY.

During a recent visit of a special agent of the Bureau to the office of the Lewiston and Auburn Electric Light Company, he was shown certain kitchen utensils and other implements of household economy which, connected with the electric current, proved the practicability of the use of electricity as a substitute for wood and coal for domestic heating and cooking purposes.

Two small radiators were in use, keeping the large office comfortable on a very cold day. Flatirons and the tailor's goose were kept hot for constant use by a connection with the electric current, and in the same way coffee pots and small cooking kettles were quickly heated. A baking oven was also shown in which it was claimed that all kinds of bread, pastry and meats could be cooked as satisfactorily as by the use of fuel.

From what could be learned it would seem that ordinarily the cost of the electric current in sufficient volume to make cooking and heating a success was above that of ordinary fuel, and so out of reach of the average working man. But with a reduced cost of the electric current, brought about by utilizing the large water powers of our State, it is not improbable that cooking and heating by electricity may come into quite general use in some sections in the near future.

It is stated, and without doubt correctly, that what is known as shredded wheat biscuit, which is now manufactured in large quantities and sold as a breakfast food throughout the country,

is all baked by electric heat furnished by a power plant at Niagara falls.

With the water power developed at Deer rips capable of furnishing electric current far above present demands for manufacturing, lighting and car service, and with the lighting company interesting itself in the introduction of all necessary utensils and appliances for thoroughly testing the matter, there is no doubt that the questions as to the utility and economy of cooking our food and heating our dwellings by electricity will soon be worked out in a practical way in the cities of Auburn and Lewiston.

CENTRAL ELECTRIC LIGHT AND POWER STATIONS IN 1902.

The last complete investigation of central electric light and power stations was made two years ago by the United States Census Bureau, and covers the whole country for the year 1902. From the report of this investigation we learn that at the time of the enumeration there were 3,620 central electric stations in operation. The cost of their construction and equipment amounted to $504,740,352. The gross income for the year was reported at $85,700,605, and the total expenses at $68,081,375. These stations furnished employment to 23,330 wage earners, who received $14,983,112 as wages during the year, an average of $642.22. The power plant equipment consisted of 5,930 steam engines, with 1,379,941 indicated horse power, and 1,390 water wheels, with a stated horse power or 1,624,980. The generating plants consisted of 12,484 dynamos of every description with a stated horse power of 1,624,980.

From the report of that investigation we have made a compilation of the figures relating to the business in the State of Maine, which we here present in a readable form.

Between the figures of the Census investigation for 1902, and those obtained by the Maine Bureau of Industrial and Labor Statistics for 1904, we can make no complete comparisons, from the fact that the two investigations were made along different lines, and the further fact that the money at our disposal did not warrant the field work necessary to make our investigation complete. But in order to show the rapid increase in the business during the last two years it may be noted that the total horse

power of the water wheels and engines of the 52 plants in 1902 was 24,889, while the same item in 46 plants in 1904 was 35,163 horse power.

In 1902 there were 50 central electric light and power stations in Maine controlled by private parties or corporations. Of this number one was installed in 1883, one in 1884, two in 1885, three in 1886, eight in 1887, four in 1888, two in 1889, one in 1890, one in 1892, three in 1893, two in 1894, five in 1895, one in 1896, one in 1897, three in 1898, six in 1899, one in 1900, and five in 1901.

In addition to those classed under private ownership were two stations owned by municipalities, one of which was installed in 1888, and the other in 1894, making an aggregate of 52 central stations in the State. The cost of construction and equipment of the 52 plants, both private and public, was $4,824,850.

The total earnings during 1902 were, from arc lighting, $124,668; from incandescent lighting, $450,050; all other electric service, $93,857; total earnings from operation, $668,575; income from other sources, $23,775; gross income for the year, $692,350.

The expenses for the 52 plants were, for salaries and wages, $202,726; for supplies, materials and fuel, $174,527; rents, taxes, insurance, and miscellaneous, $102,597; interest on bonds, $91,239; total expenses for the year, $571,089.

The total horse power of engines and water wheels for the 52 plants was 24,889; of dynamos, 20,498. The total output of stations for the year in kilowatt hours was 21,987,700. The number of miles of mains and feeders, electric light construction, was 1,697.65. Number of arc lamps, 2,254; incandescent lamps, 204,632. Average number of salaried officials and clerks, 88; total salaries, $50,396. Average number of wage earners, 252; total wages, $152,330.

Private Ownership.

We here drop out the 2 municipal plants and give the facts relating to the 50 plants classed under private ownership. The earnings for 1902 were, from arc lighting, $115,068; from incandescent lighting, $445,550; from all other electric service, $93,857; total earnings from operation, $654,475; income from all other sources, $23,775; gross income for the year, $678,525.

The expenses were, for salaries and wages, $197,962; for supplies, materials, and fuel, $173,186; rents, taxes, insurance, and miscellaneous, $101,387; interest on bonds, $91,239; total expenses for the year, $563,774.

The income in detail was, from arc lighting, commercial or other private, $34,874; public, $80,194; total from arc lighting, $115,068. From incandescent lighting, commercial or other private, $403,857; public, $41,693; total from incandescent lighting, $445,550. From motor service, $92,032; from electric railway service, $1,137; from electric heating, $56; from all other electric service, $632; from all other sources, $23,775, making an aggregate income for the year of $678,250.

The character of ownership of the 50 plants when installed was, individual, 12; corporation, 38. Character of ownership in 1902, individual, 8; corporation, 42. The number of plants engaged in arc lighting, commercial or other private, was 25; public, 25. The number engaged in incandescent lighting, commercial or other private, was 50; public, 42. The number of plants furnishing motor power was, stationary, 19; electric railway, 1; all other, 13.

The total capital stock authorized for the 50 plants was $2,823,100; amount issued, $2,243,910; dividends paid, $41,890. This was divided into common and preferred stock. The amount of common stock authorized was $2,583,100; amount issued, $2,015,960; dividends paid, $31,550. The amount of preferred stock authorized was $300,000; amount issued, $227,950; dividends paid, $10,340. The amount of bonds authorized was $2,792,000; bonds outstanding, $2,266,500; interest, $91,239, making the total par value of stocks and bonds issued, $4,510,410.

The total cost of construction and equipment of the 50 plants to date was $4,783,150; cost of same during 1902, $555,350.

The cost of supplies and materials for the 50 plants during 1902 was, for 90 meters, $1,953; 59 transformers, $2,800; 97,935 incandescent lamps, $16,245; incandescent lamp fittings, sockets, etc., $1,787; 274,422 carbons for arc lamps, $4,179; 7,112 globes for arc lamps, $1,602; arc lamp repairs, $5,514; poles, or other supports, $8,197; wire and cable, $7,293; mill supplies (oil, waste, etc.), $6,516; all other materials, $10,123; power pur-

chased, $26,830; freight paid, not included in other items, $2,215, making a total cost of supplies and materials of $95,254. The cost of fuel was, for 18,153 tons of coal, $75,100; all other fuel, $2,832, making a total cost of fuel of $77,932, and an aggregate cost of supplies, materials and fuel of $173,186.

The salaries of officials of the 50 plants for the year was, 26 general officers, $12,216; 34 other officers, managers, superintendents, etc., $26,569; 27 clerks, $10,779, a total of salaries of $49,564. The pay of wage earners was, 14 foremen, $11,601; 4 inspectors, $3,080; 20 engineers, $14,560; 21 firemen, $11,225; 59 dynamo and switchboard men, $37,307; 55 linemen, $31,618; 10 mechanics, $6,293; 16 lamp trimmers, $8,887; 47 other employes, $23,827, a total of wages of $148,398. The total number of salaried officials was 87, the total number of wage earners, 246, and the total amount of salaries and wages was $197,962.

The miscellaneous expenses of the 50 plants for the year were, for rent of stations, supports, conduits, etc., $3,314; rent of offices, $1,186; taxes, $18,402; injuries and damages, $3,007; insurance, $8,774; ordinary repairs of buildings and machinery, $30,043; all other, $36,661, a total of $101,387.

The total electric line construction of the 50 plants consisted of 1,186 miles of mains, and 467.65 miles of feeders, a total of 1,653.65 miles, all of which were overhead wires.

The power and generating equipment of the 50 plants consisted of 57 steam engines, developing 11,080 horse power; 52 water wheels, developing 12,671 horse power; and 6 auxiliary steam engines, developing 563 horse power, a total of 24,314 horse power. Of the 57 steam engines, 55 were 500 horse power and under, developing 9,780 horse power; and 2 were over 500 and under 1,000 horse power, developing 1,300 horse power. Of the 52 water wheels, 38 were 500 horse power and under, developing 5,815 horse power; and 14 were over 500 and under 1,000 horse power, developing 6,856 horse power. There were also of dynamos 75 direct current, constant voltage, developing 6,022 horse power; 23 direct current, constant amperage, developing 741 horse power; and 75 alternating and polyphase current, developing 13,465 horse power, a total of 173 dynamos, developing 20,228 horse power. There was also 1 booster, developing 90 horse power.

The substation equipment consisted of 2,917 transformers on circuits for consumers, developing 10,244 horse power, and 5,157 mechanical meters on consumers' circuits.

The output of the 50 stations was a total of 21,417,570 kilowatt hours for the year, averaging 59,083 per day. The horse power hours of current for the year were 28,345,863, averaging 78,375 per day.

For the 50 plants the number of arc lamps on direct current for commercial or other private use was 327, of which 95 were open and 232 enclosed; direct current, public use, 830, of which 353 were open and 477 enclosed. The number of arc lamps on alternating currents for commercial or other private use was 397, all of which were enclosed; on alternating current, public use, 508, all of which were enclosed. The total number of arc lamps in use was 2,062, of which 1,338 were in public use, and 724 in private use; 448 were open and 1,614 were enclosed; 1,157 were on direct current, and 905 on alternating current.

For the 50 plants the number of incandescent lamps of 16-candlepower for commercial or other private use was 193,582; for public use, 2,506, a total of 196,088. The number of 32-candlepower for commercial or other private use was 2,086; for public use, 761, a total of 2,847. The number of all other candlepower for commercial or other private use was 3,702; for public use, 1,695, a total of 5,397. The total number of all candlepower for commercial or other private use was 199,370; for public use, 4,962, an aggregate of 204,332.

The number of stationary motors in service was 525, developing 6,437 horse power.

Municipal Ownership.

We now take up the facts in regard to the 2 municipal plants. The earnings for 1902 were, from arc lighting, public, $9,600, and from incandescent lighting, public, $4,500, making a gross income of $14,100.

The expenses were, for salaries and wages, $4,764; for supplies, materials and fuel, $1,341; rents, taxes, insurance, and miscellaneous, $1,210, a total of $7,315.

Both plants did public lighting only, one using arc lamps, and the other incandescent lamps.

The cost of construction and equipment to date was $41,700; for the year 1902, $5,450.

The cost of supplies and materials for the 2 plants during 1902 was, for 500 incandescent lamps, $150; incandescent lamp fittings, sockets, etc., $10; 24,000 carbons for arc lamps, $600; 96 globes for arc lamps, $72; poles, or other supports, $65; wire and cable, $169; mill supplies (oil, waste, etc.), $65; all other materials, $160; freight paid, not included in other items, $50, making an aggregate cost of supplies and materials of $1,341.

The salaries of officials of the 2 plants for the year were, for 1 superintendent, $832. The pay of wage earners was, for 1 inspector, $728; 1 dynamo and switchboard man, $500; 4 lamp trimmers, $2,704, a total of wages of $3,932. The total number of salaried officials was 1, the total number of wage earners was 6, and the total amount of salaries and wages was $4,764.

The miscellaneous expenses of the 2 plants for the year were, for ordinary repairs of buildings and machinery, $575; all other, $635, a total of $1,210.

The total electric line construction of the 2 plants consisted of 44 miles of mains, all of which were overhead wires.

The power and generating equipment of the 2 plants consisted of 2 water wheels, developing 375 horse power, and 1 auxiliary steam engine, developing 200 horse power, a total of 575 horse power. There were also of dynamos 3 direct current, constant voltage, developing 160 horse power, and 1 alternating and polyphase current, developing 110 horse power, a total of 4 dynamos, developing 270 horse power.

The substation equipment consisted of 3 transformers on circuits for consumers, developing 15 horse power.

The output of the 2 stations was a total of 570,130 kilowatt hours for the year, averaging 1,562 per day. The horse power hours of current for the year were 760,051, averaging 2,083 per day.

The 2 plants had 192 direct current arc lamps, and 300 32-candlepower incandescent lamps, all in public use.

MARKET GARDENING IN MAINE.

In 1899 there were 19,844 acres devoted to miscellaneous vegetables in the State of Maine, the products of which were valued at $1,207,075; also 1,036 acres devoted to small fruits, with products valued at $157,679; 168 acres to onions, with products valued at $38,160; and 51 acres to grapes, with products valued at $7,584, making a total of 21,099 acres, with products valued at $1,410,098. This was exclusive of potatoes and orchard fruits, a considerable portion of the early varieties of which might properly be classed among the products of market gardening, which would bring the total value of market garden products fully up to $1,500,000.

Market gardening has received a decided impulse within a few years, and today there is probably no industry within the borders of the State that is making a greater increase from year to year. This is principally due to the large and rapidly increasing summer tourist business, although the consumption of the finer grades of vegetables, fruits and berries among the laboring classes in our cities and villages is much more common than formerly.

In making an investigation of market gardening as it exists today, no attempt was made to canvass the whole State. Nearly all farmers are, to a greater or less extent, market gardeners. Most farmers in the central and southern parts of the State raise more vegetables, fruits and berries than they consume and these products, in small lots, are carried to the adjacent cities or villages and frequently are exchanged at the grocery store for other commodities. A market gardener, according to our classification, is one who devotes most of his time and energy to the cultivation and production of garden vegetables, fruits and berries for the market.

For the purpose of gathering some facts in regard to the increase of this branch of industry, certain towns near our cities

and summer resorts were selected, and after securing the names of those principally engaged in the business, a blank with the following questions was sent to them, with a postpaid envelope enclosed, for reply:

1. Name and post office address,.....
2. State kinds of products raised by you for market last year and approximate amount of each. Peas,.....cabbages,.....squashes, ...beans, ...strawberries, ...other items,.....
3. Where is your product marketed?.....
4. Total value of your products last year,.....
5. Number of hands employed,.....
6. Average wages of employes,.....
7. Cost of materials and labor,.....
8. Is market gardening on the increase in your vicinity?.....
9. What effect, if any, has the summer tourist business had on market gardening in your vicinity?.....
10. What lines of market gardening could be extended profitably in your vicinity?.....

In the following pages the main facts from the various responses received, also many facts gathered by personal interviews with leading market gardeners, are presented by towns. The facts in regard to cabbage raising in Cape Elizabeth were nearly all collected by personal interviews.

AUBURN.

Four returns were received from Auburn where considerable market gardening is done, the principal market being the cities of Auburn and Lewiston. Three market gardeners reported an aggregate of 2½ tons of cabbages raised last year, 2¾ tons of squashes, 1 ton of carrots, 200 bushels of early potatoes, 8 bushels of beans, 3,778 quarts of strawberries, 357 dozen bunches of celery, worth $330; tomatoes to the value of $120; tomato and celery plants, $72; beets, $30; lettuce, $20; and corn, $15.

One gardener reported one-fourth acre of beets, one-half acre of celery, and one-half acre of tomatoes, besides hothouse products, all amounting to about $700 in value. The wages of employes averaged $1.50 per day, and by the month, from $18 to

$20. Some complaint was made of the scarcity and high cost of help. One report stated that out of town sales of garden produce fell off 75 per cent after September first.

BANGOR.

Some interesting reports were received from Bangor, containing valuable information and suggestions. Bangor is the only city in the State, as far as we know, that has an out-door market six days in the week. This market place is in Pickering square, a little off from Main street. The farmers and gardeners from the country adjacent begin to come in as early as three o'clock in the morning in summer, and by seven or eight o'clock there are several rows of heavily loaded market wagons lined up in regular and systematic order. The number of market teams varies from day to day, usually from fifty to seventy-five, but occasionally the number reaches one hundred and fifty. Quite a number of these teams are presided over by women and they are as alert and business-like as the men.

The produce displayed for sale by these country merchants is always fresh and, taken together, makes a fine display. In addition to the products of the garden, poultry, eggs and butter are brought in liberal quantities. Here hundreds of prudent housewives make their daily purchases, market men replenish their stores, and dealers ever stand ready to take any surplus with which to supply their urban and out of town customers. The sale is generally brisk, and by noon the market is clear of country teams. A considerable portion of the produce sold in this market is shipped to other points, principally to Bar Harbor.

From two reports received from Bangor we gather the following items: Cabbages raised, 2,000 heads; squashes, one-half ton; strawberries, 2,800 quarts; gooseberries, 200 quarts; ears of corn, 500 dozen; early potatoes, 50 bushels; turnips, 100 bushels; carrots, 100 bushels; cucumbers, 200 bushels. One gardener made the suggestion that a pickle factory established in Bangor would be a great benefit to market gardeners in Penobscot county, and this is undoubtedly correct. There are two pickle factories in the city of Portland, and vast quantities of cucumbers, tomatoes, cauliflower and onions are required by these busy industries.

One market gardener in Bangor made a partial report of the poultry business which he carries on as a kind of side line. He keeps from 300 to 400 hens for the production of eggs, and raises yearly from 500 to 1,000 chickens for market. He marketed 4,000 dozen eggs and 3,000 pounds of poultry last year. His eggs are sold mostly in Boston, but his dressed chickens find a ready sale in the Bangor market.

Another gardener from Bangor gave $129 as the value of strawberries sold. He also marketed a large quantity of early potatoes, peas, beans, corn, etc., but kept no account of their quantity or value.

In answer to the question, "What lines of market gardening could be extended profitably in your vicinity?" this report stated that all hothouse vegetables and products could be extended indefinitely, but would particularly recommend the raising of asparagus. The other reports, in answer to the above question, recommended the raising of berries and all lines of garden produce.

Quite a number of people in Bangor and all adjacent towns, make a specialty of market gardening, some cultivating from two to four acres of land for this purpose, and, so far as heard from, they all agreed that this was the best paying part of their farming. It is claimed that all the vegetables found in the Boston market, with the exception of garlic and leeks, can be found in the Bangor market.

There is no danger of overstocking the market. Any surplus can be sent to Boston, but there is no surplus as yet. Our summer resorts find it difficult to procure enough of small fruits and the choicest vegetables. The increase in the number of summer visitors creates a larger demand from year to year for fresh, Maine-grown vegetables.

BAR HARBOR.

A few years ago, Maine's greatest summer resort depended almost entirely on Arlington, Massachusetts, and other market gardening centers outside of the State, for its supply of garden vegetables. Today this is all changed. Farmers in the vicinity are dropping the old ideas in regard to the raising of field crops, and are now cultivating what the local market demands. We

quote from a letter received from Bar Harbor in response to some inquiries sent to an official in that town:

"Market gardening has reached a very high standard in this town, owing to the unusual demand for garden delicacies, caused by the large number of wealthy people who come here in summer. I doubt if there is a place in the State where so great a variety of fruits and vegetables are raised. Peaches, melons, grapes, figs and apricots are raised under glass in quite large quantities. Outside the village the land is practically all used for raising vegetables to supply this market." The writer also gave the names of several men who started with nothing a few years ago and have a competence today, acquired in market gardening.

The reports from Bar Harbor and vicinity differed somewhat from those received from other localities, the products here running very largely to small fruits. One report gave peas, 10 bushels; cabbages, 100 heads; beans, 6 bushels; strawberries, 4,000 quarts; raspberries, 1,000 pints; and blackberries, 1,000 pints.

The raising of vegetables under glass is rapidly increasing, and market gardening in Maine is perhaps reaching its highest development here. Small fruits are being more extensively raised here than elsewhere in the State, and all the finer grades of garden produce are receiving special attention. The reports all agreed that market gardening was on the increase, caused almost entirely by the summer resort business.

In reply to the question, "What lines of market gardening could be extended profitably in your vicinity?" the answers generally were, all lines, with special reference to small fruits.

BOOTHBAY.

Three reports were received from Boothbay, from which we gather the following items: Peas raised, 30 bushels; cabbages, 1,000 heads; squashes, one-half ton; beans, 33 bushels; early potatoes, 700 bushels; corn, 100 bushels; apples, 200 barrels. In Boothbay and vicinity many tourists spend the summer, and all kinds of garden produce are in great demand.

In reply to the question, "Is market gardening in your vicinity on the increase?" all three answered, yes. All agreed that the

summer tourist business had largely increased the demand for the product of the garden, one report claiming fully 100 per cent.

In reply to the question, "What lines of market gardening could be extended profitably in your vicinity?" one report answered, all kinds; while another answered, small fruits, sweet corn and small vegetables. It is evident that the supply of garden products has not reached the demand in the vicinity of our summer resorts.

CAMDEN.

Several reports were received from Camden, from which we gather the following items: One market gardener reported raising lettuce last year to the value of $110; celery, $105; and berries, $48. Another gardener reported raising 15 bushels of plums, 7 bushels of pears, and a quantity of quinces. Still another reported raising 6 bushels of peas, half a ton of cabbages, half a ton of squashes, 15 bushels of beans, 3 bushels of strawberries, 100 bushels of early potatoes, and 100 barrels of apples. The reports all agreed that market gardening was on the increase, also that the summer tourist business was the cause of the increase.

In reply to the question, "What lines of market gardening could be extended profitably in your vicinity?" one answered, small fruits; while another answered, quinces, cauliflower, asparagus, celery, and all kinds of berries; while still another answered, strawberries, raspberries, peas, beans, cauliflower, lettuce, celery, etc.

One of the most interesting items gathered from Camden was in regard to the raising of cucumbers by contract for pickle factories in Massachusetts. It seems that the agents of the Eastern Steamship Company at Belfast and Camden, are the agents of the great pickle manufacturers, Skilton, Foote and Company of Boston. The steamship agents make the contracts and ship the product to Boston. The contracts usually cover from one-half to two acres per farm, and the seed is furnished at cost by the company.

The contracts are made with farmers scattered over many towns in the southern part of Waldo and northern part of Knox counties. The business is gradually increasing and the price per 1,000 has recently been increased from 90 cents to $1.25. The

present season there were 27 acres under contract at the Belfast agency and 48 acres at the Camden agency, making 75 acres in all. The prices paid this year per 1,000 cucumbers were $1.25 for fines and mediums, and 70 cents per 1,000 for coarse. The cucumbers are gathered and packed in large barrels with holes bored above the bottom hoops to secure ventilation, and covered with cloth, then the filled barrels are delivered at the shipping points.

The value of the crop varies in different years and on different farms, but probably $100 per acre would not be above the average. One farmer reported $150 per acre. Another reported $175 per acre, and one man reported $86 from one-fourth of an acre. On the whole the raising of these cucumbers is considered a profitable thing for the farmers.

In this connection the fact may be stated that the proprietors of the pickle factories in Portland are in the habit of making contracts with farmers for cucumbers, and quite a number of farmers in the towns of Naples, Bridgton and Harrison have for several years contracted to plant several acres each to cucumbers for furnishing the Portland factories. One concern had 75 acres under contract in the year 1900. The Boston factories, as well as the Portland factories, are eager to obtain cucumbers raised in Maine, and the proprietors agree that no better cucumbers are raised anywhere.

CAPE ELIZABETH.

To vessels entering or leaving Portland harbor, Cape Elizabeth presents a rockbound and rather forbidding shore line. The two Cape lights, at the extreme point of the town where it juts out into the sea, are familiar to all mariners, as well as to all who travel in vessels along our coast. This town, small in area, containing only 7,000 acres, is situated near Portland. The surface is very uneven and ledges crop out here and there, but between the elevations are small fertile valleys.

One of the most interesting results of this investigation was the data obtained in regard to cabbage raising in Cape Elizabeth. Some thirty years ago, one or two farmers conceived the idea that cabbages could be grown here in large quantities successfully. The idea probably originated from the fact that an opinion prevailed then, as it does to some extent now, that salt air

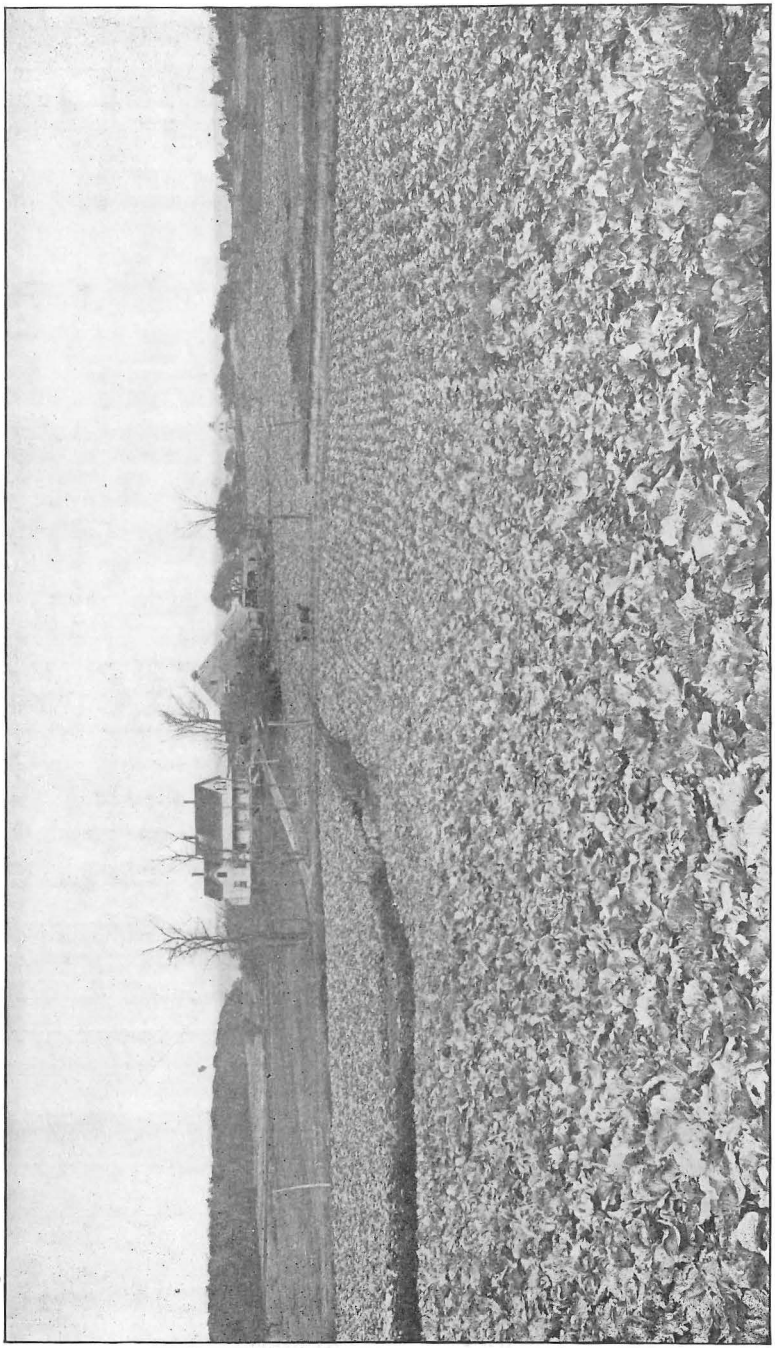
is conducive to the healthy growth of cabbages, and certainly this town, almost surrounded by the ocean, gets an abundance of salt air. Besides this, the farmers of Cape Elizabeth were at that time in the habit of dressing their land with seaweed which cost nothing except the hauling from the shore to the patch of land where it was to be used. This custom still prevails, and possibly the seaweed as a fertilizer may be especially adapted to the growth of cabbages. Be that as it may, from a very humble beginning the industry grew rapidly, until Cape Elizabeth became known all over New England on account of its annual crop of perfect cabbages.

The largest recorded crop from this town was 6,000 tons, over one-half of which, or 3,000 tons, were sent to Boston, Providence, Manchester and other points out of the State, requiring over 200 freight cars to convey them to market, the average load per car being 15 tons. The Hannaford Brothers Company of Portland used over 100 cars, and the remainder were divided among other produce shippers. The average market price for that season was $50 per ton, making a value of $300,000 for the entire crop. The average yield per acre is about 15 tons, so it would require 400 acres to grow 6,000 tons.

Hannaford Brothers Company do an immense business in buying and selling produce, amounting in some years to $500,000. Albert F. Hannaford, the father, was a pioneer in cabbage raising, and is still one of the heaviest producers in Cape Elizabeth. Their warehouse is on Commercial street, Portland, and they have also an office in Boston.

While for many years cabbages have been the principal crop of Cape Elizabeth as far as market gardening is concerned, and have made the town somewhat famous, yet other crops are raised in abundance, and the cultivation of squashes, beets, carrots, celery, cauliflower, tomatoes, cucumbers, etc., is increasing rapidly.

It is estimated that over 6,000 tons of squashes have been raised in Cape Elizabeth in a single year, and some market gardeners are becoming very prosperous in raising squashes as their principal crop. Nearly all raise early potatoes and remarkably large crops to the acre are reported. The town is not remarkable for the quantity of small fruits produced, although many strawberries of excellent quality are raised.



A CABBAGE FARM IN CAPE ELIZABETH.

A town of less than one-third the area of the average of towns in the State, with a surface rocky and broken, with a soil no more fertile than that of other sections along our coast, Cape Elizabeth has made itself almost a model in the way of market gardening, raising garden crops amounting to many hundred thousand dollars annually. None of its inhabitants complain that farming does not pay in Maine.

Blanks were sent to only a few of the market gardeners in Cape Elizabeth. From returns received we learn that the aggregate product of two farms was 300 barrels of peas, 80 tons of cabbages, 30 tons of squashes, 8 bushels of beans, 1,500 quarts of strawberries, 1,700 bushels of early potatoes, 40 barrels of beets, and 200 bushels of turnips. From a return which gave values instead of quantities, we learn that the products of a single farm was valued at $1,750, divided as follows: Peas, $100; cabbages, $300; squashes, $500; beans, $100; corn, $100; onions, $100; beets, $100; carrots, $50; parsnips, $50; early potatoes, $250; and tomatoes, $100.

In answer to the question, "What lines of market gardening could be extended profitably in your vicinity?" one replied, all of them; and one replied, small fruits. The most of the answers to this question were that the cultivation of all lines of garden produce could be extended profitably.

CARMEL.

Several reports were received from Carmel and from them we give the following items: One gardener reported raising last year, 15 bushels of peas, 10 bushels of beans, and other garden produce to the value of $600. His product was sold in Bangor. Another reported 3,500 heads of cabbages, 150 bushels of peas, 100 bushels of string beans, 150 bushels of early potatoes, and 1¼ acres planted to sweet corn for table use. Another reported raising 1,000 heads of cabbages, 10 bushels of beans, and strawberries to the value of $250. Still another reported raising 6 bushels of peas, 10 bushels of beans, and quantities of bunch onions, beets, etc. Carmel shipped to Boston during the season, over 2,000 bushels of green peas, and hauled to the Bangor market about 1,500 bushels, a total of 3,500 bushels.

All the reports agreed that market gardening may be increased profitably in all lines, but especially in the matter of small fruits.

CUMBERLAND.

Several reports from Cumberland, a few miles out of Portland, show that market gardening is increasing in that town, and that the products are marketed principally among summer tourists. Peas, cabbages, strawberries, spinach, early potatoes, apples, etc., seem to be the principal items mentioned in these reports.

EDGECOMB.

A gardener in Edgecomb gave items as follows: Peas raised, 15 bushels; squashes, 200; beans, 4 bushels; early potatoes, 225 bushels; carrots, 265 bushels; turnips, 175 bushels; plums, 25 bushels; blackberries, 8 bushels; the whole amounting to $562 in value. His market was Boothbay Harbor. He paid his help $1.25 per day. His testimony was the same as others in regard to the effect of the summer tourist business in increasing the demand for all kinds of garden produce.

ETNA.

Etna is becoming noted on account of the quantity of green peas produced, which are shipped, not only to points in Maine, but thousands of bushels are sent every year to the Boston market. Formerly the shipment of peas from Etna was practically all done from the 5th to the 12th of July, when from 700 to 900 bushels would be sent away each night, but now large fields are planted to peas of different varieties and at different times, so as to have a succession of crops for picking, which lasts until the first of September.

When the farmers commenced the raising of peas for market, nearly all were sold in Bangor, but in recent years, while many are still sent to the Bangor market, by far the larger part is shipped to Boston.

Nearly all peas are put into the ground with a planter, in drills about three feet apart, from 1 to 1½ bushels of seed being used to an acre, and the fertilizer is put in at the same time. There are many varieties planted, but the principal kinds are the Alaska for an early crop, and the Telephone, Duke and Gradus for later picking, the last named taking the lead. Several Etna farmers plant from two to three acres and, as there has been but

little damage from insects in recent years, the green pea crop has been a very profitable one.

The average price has been in the neighborhood of $1.00, although some sold as low as 50 cents, while others sold as high as $2.50 per bushel. At the present time nearly every grower ships his own peas instead of selling to a local agent, and so gets the full price himself.

Last season there were shipped by rail from the town of Etna, 5,000 bushels of green peas to Boston, and also 3,000 bushels hauled by teams to local markets, mostly to Bangor, making 8,000 bushels sold from that town.

FOXCROFT, GARDINER AND GREENE.

A gardener in Foxcroft gave the value of his produce as $675, consisting of cabbages to the value of $120, early potatoes, apples, berries, pears, sweet corn, etc. His materials and labor cost $260. He employed two hands, paying them $21 per month and board. This gardener stated that the business was increasing in his vicinity, and he recommended the raising of early fruit, plums, berries, grapes, pears, all kinds of vegetables, and sweet corn.

Reports from Gardiner and South Gardiner indicated that farmers were gradually changing their lines of products, and were depending much more than formerly upon the sales of milk, eggs, and all kinds of vegetables.

A report from Greene indicated similar changes in methods in that town, and also spoke of Lewiston as being one of the best markets in the State for farm and garden products.

HALLOWELL.

Two reports were received from Hallowell, from which we gather the following items: One gardener raised 7 bushels of peas, 20 bushels of beans, 300 quarts of strawberries, 1,400 quarts of other berries, and sweet corn to the value of $25. He employed two hands at $1.00 each per day.

This gardener commended the Loudon raspberry as very hardy and a great yielder. He complained that the birds did great damage to strawberries and other small fruits, and wanted

to know what would check them. Another Hallowell gardener reported raising 30 baskets of strawberries, and 200 bushels of onions.

The three cities of Gardiner, Hallowell and Augusta are good markets for all kinds of garden vegetables, early potatoes, early apples, small fruits, etc., and naturally market gardening is on the increase in this vicinity. At the Insane hospital in Augusta, gardening is carried on extensively, and practically all the fruits and vegetables used there are produced on the finely managed farm connected with the institution.

HANCOCK.

All the reports from Hancock were interesting and instructive. From them we gather the following items: One gardener reported raising last season, 10 bushels of peas, 500 cabbages, 500 squashes, 1,000 quarts of strawberries, 10 bushels each of turnips, beets and carrots, and 100 bushels of early potatoes. He employed one man at $1.50 per day. His markets were Bar Harbor and Boston.

Another reported 6,000 quarts of strawberries raised last season, and 500 quarts of currants and gooseberries. His total product of berries amounted to $900 in value. The cost of materials and labor was $250. He employed one man regularly, but in picking time he had 10 hands, paying wages at the rate of $25 per month. Bar Harbor and Boston are his markets. He thought small fruits paid the best, but said that all lines could be increased profitably.

Another gardener reported raising 10 bushels of peas, 1 ton of squashes, 1,800 quarts of strawberries, 2,000 quarts of raspberries, 1,500 quarts of blackberries, and 100 barrels of apples. He also sold strawberry, raspberry and blackberry plants. His whole product amounted to $3,800 in value, being the largest product reported by one man during this investigation. His materials and labor cost $2,000. He employed one man regularly, and in picking time about 30, paying wages at the rate of $22 per month. He said that the summer tourist business had increased the demand, and raised the price and the standard of quality of all market garden products.

Another Hancock gardener reported raising 4,000 quarts of strawberries, 1,000 quarts of blackberries, 300 quarts of raspberries, and 6 bushels of plums. His whole product amounted in value to $600. The cost of materials and labor was $200. He paid $25 per month for help. He said the demand for all kinds of vegetables, fruits and berries was steadily increasing. His market is Bar Harbor.

Another reported raising 25 bushels of peas, 500 squashes, 300 bushels of early potatoes, and 20 bushels of turnips. He claimed that 90 per cent of the demand for his product was on account of the summer tourists. His market is Bar Harbor and Boston.

Several reports were received from Mount Desert Ferry, in the southern part of Hancock, the writers of which agreed that market gardening was increasing rapidly in their vicinity. They recommended raising early fruits and vegetables, also early potatoes, and suggested utilizing seaweed along the coast for dressing.

One gardener from South Hancock wrote as follows: "I am engaged in dairying and market gardening in a small way. Farm labor is so scarce and unreliable that I prefer to do just what I can attend to myself. There are forty-four cottages and one hotel at Hancock Point, three miles from my place, where there is an excellent market throughout the season for all kinds of farm products, with a strong probability that the business will increase from year to year. The tourist travel has had the effect of causing farmers to produce a greater variety, a better quality, and a much larger yield per acre than formerly, and still there is room for great improvement along all the lines touched upon by your questions."

HERMON.

The town of Hermon is near Bangor and that city is naturally the market for garden and farm products. Several reports were received from Hermon, from which we give the most important items. One gardener reported raising last year 10 bushels of peas, 100 cabbages, 100 squashes, 100 bushels of early potatoes, 100 barrels of apples, and 6 bushels of strawberries, the whole amounting to $500 in value.

Another gardener reported 10 bushels of peas, 1,200 cabbages, 1 ton of squashes, 5 bushels of beans, 1,000 quarts of strawber-

ries, etc., the whole amounting to $600 in value. He paid $20 per month for help, keeping one hand all the time and two part of the time. His market was Bangor and Boston. He reported market gardening as on the increase, a condition due mainly to summer travel. He thought that the output of strawberries and peas could be increased profitably.

Still another reported raising 300 quarts of strawberries, and beets and carrots in quantities not given. All agreed that market gardening was increasing in the vicinity of Bangor.

One of the Hermon reports stated that the writer kept 400 hens, sending the eggs to the Boston market. Several of our reports have contained figures in regard to poultry raising and the production of eggs, and we find that some enterprising market gardeners combine the hen business with that of gardening, making the two lines very profitable.

SCARBORO.

Several reports were received from Scarboro containing some interesting items, as follows: One gardener raised 140 bushels of peas last season; another, cabbages to the value of $120; and still another, 30 barrels of peas, 6 tons of cabbages, 10 bushels of beans, and 200 quarts of strawberries, all of which were sent to Boston. Smaller lots of different kinds of produce were sold by each of the above to the proprietors of hotels in the vicinity.

One report gave an extended list of garden produce that might be increased profitably, including strawberries, raspberries, blackberries, peas, beans, early potatoes, cucumbers, cabbages, melons of all kinds, currants, gooseberries, lettuce, beets, gourds, turnips and sweet corn, and adds that all the above find a ready market at the nearby summer hotels.

SOUTH PORTLAND.

In 1895 the town of Cape Elizabeth was divided and the northerly part was incorporated as the city of South Portland. This portion contains 8,000 acres and there are quite a number of cabbage raisers and market gardeners within the limits of the present city. One gardener reported raising 100 barrels of peas, 30 tons of cabbages, 10 tons of squashes, 4,000 quarts of strawberries, 500 bushels of early potatoes, and 250 bushels of turnips.

In answer to the question, "What lines of market gardening could be extended profitably in your vicinity?" one replied that he believed that market gardening in general could be profitably extended in this vicinity.

Higgins Brothers of South Portland are extensive market gardeners, raising a great deal of their produce under glass. They have three large greenhouses, 312 by 40 feet, 294 by 40 feet, and 225 by 32 feet in size respectively, besides a very large number of hotbeds.

They raise many early cucumbers, much lettuce, and other garden vegetables that the early spring market demands. They also produce large quantities of early potatoes and have raised as high as 600 bushels to the acre. They have also raised 1,000 bushels of beets on about two acres of land. They are raisers of the finer kinds of vegetables and their produce is always in great demand. They think that market gardening could be profitably extended, especially in the finer grades, and in the cultivation of small fruits.

WATERVILLE AND WINSLOW.

One gardener in Waterville gave as items of his crop in 1903, 60 bushels of peas, 100 heads of cabbage, 30 bushels of beans, 80 crates of strawberries, 50 bushels of tomatoes, 50 bushels of cucumbers, and smaller lots of other produce. He stated that in many lines his product was more than doubled in 1904. His market is Waterville. He recommended raising more small fruits, celery, cauliflower and horseradish. He complained that he had had great difficulty in procuring help, and that this difficulty was one of the great drawbacks to market gardening everywhere.

A report from Winslow contained the following items: Peas raised, 50 bushels; cabbages, 500 heads; squashes, 150; wax beans, 60 bushels; early potatoes, 150 bushels; beets, 50 bushels; turnips, 35 bushels; tomatoes, 50 bushels; pumpkins, 100; onions, 5 bushels; cauliflower, 50 heads; also sweet corn to the value of $75. His market is Waterville. He recommended raising more cauliflower, peas and beans. He paid his help $1.50 per day, and his materials and labor cost $300 for the season.

SMALL FRUITS.

Through the courtesy of Prof. W. M. Munson of the University of Maine, we are enabled to present the following paper on small fruits, prepared by him especially for this report:

The progress made in the culture of small fruits during the past twenty years has been rapid and substantial, but even at the present time the importance of this branch of horticultural work is not fully recognized by the people of the State. From the very nature of the soil and climate of Maine, we must look to intensive rather than to extensive operations for the most profitable returns. With the increasing importance of our summer resorts, new and extensive markets are opened; while the operatives in the factories are always large consumers of fruit. For this reason the culture of small fruits seems to offer a specally promising field at the present time.

The essential elements of success in small fruit growing are: suitable location; thorough preparation; the best varieties; careful planting; thorough culture; the application of business principles in marketing.

A warm, rather moist, sandy loam is usually considered the best soil for the small fruits, but in general, good corn land is good fruit land. Thorough drainage, either natural or artificial, is absolutely essential, and thoroughness in the preparation of the soil before planting is of prime importance. It is a good practice to grow some hoed crop, as corn or potatoes, on the land for one or two years before setting small fruits.

Spring is usually found to be the best time for setting the plants, though excellent results have been obtained with currants and strawberries set in the fall. The rows should be as long as convenient and should be far enough apart to permit of horse cultivation. On light gravelly soils, a mulch is sometimes used to advantage, and in general the dust mulch provided by frequent shallow cultivation is to be preferred.

The question of varieties, though of great importance, is one which must be settled largely by individual growers; for the success of any variety will frequently depend on local conditions. It is always a good plan for the individual grower to have a trial ground for the newer sorts. No matter how promising a given

variety may be in one section of the State, it may prove worthless in other localities.

The purpose for which fruit is grown will frequently determine the choice of varieties. Many of the choicest kinds for home use are either too soft for shipment or are not sufficiently productive to be profitable for commercial purposes. The following varieties have been found to be of general value in the State. Those marked *h* are especially valuable for home use, while those marked *m* are market sorts. Those valuable alike for home and market are so indicated. Those whose flowers have both stamens and pistils are marked "perfect"; the others are "pistilate".

Strawberries:

Bismarck (perfect), h and m.
Brandywine (perfect), h and m.
Bubach (pistillate), m.
Clyde (perfect), m.
Dayton (perfect), h.
Dorner—"Uncle Jim"—(perfect), h and m.
Dunlap (perfect), h and m.
Gibson (perfect), h and m.
Haverland (pistillate), h and m.
Lester Lovett (perfect), h and m; very late.
Midnight (perfect), h.
New York (perfect), h and m.
Sample (pistillate), m.
Warfield (pistillate), m.

Raspberries:

Black caps..Cumberland, h.
Gregg, h.
Purple.....Shaffer, h.
Columbian, h.
Red.....Cuthbert, h and m.
Loudon, h and m.
Yellow.....Golden Queen, h.

Blackberries:

Snyder, h and m.
Agawam, h and m.

Currants:

Moore's Ruby, h.
Prince Albert, h and m.
Wilder, h and m.
White Imperial, h.

Gooseberries:

Downing, h and m.
Whitesmith, h.

With the almost universal high prices received for small fruits, their culture would seem to be one branch of horticulture which would appeal strongly to the farmers of Maine. Seldom, in the central part of the State, does the price for strawberries, currants or gooseberries fall below 8 or 10 cents per quart; while the price for blackberries and raspberries is almost always higher. True there is competition from the wild fruit which grows freely on every new burn, but this need not deter one who is willing to work for *the best.* Neither is it an excuse for any farmer for not providing his own family with fruit for home consumption.

SUMMARY.

As has been elsewhere stated, no attempt was made in this investigation of market gardening to canvass the State. It would have required a small army of agents to make a house to house call among the farmers of Maine, a task that is possible only to the census enumerators. The object of this article has been to gather from towns near the cities, and those adjacent to our great summer resorts, certain facts as to the present status of market gardening. Some of these facts were as follows:

What lines of vegetables, berries, etc., are being raised.

Whether the industry is increasing or not.

What is the cause for the increase, if any.

What lines could be extended with profit.

The Census of 1900 gives some facts which can appropriately be introduced here. In 1899 the total area in the State devoted to the cultivation of small fruits was 1,036 acres, distributed among 4,577 farms. The value of the fruit grown was $157,679, an average of $34.45 per farm, or $152.20 per acre. Of the total area, 512 acres were devoted to strawberries, the total production of which was 1,066,860 quarts, an average of 2,084 quarts per

acre, grown principally in the southern counties. The acreage and production of other berries were, blackberries, 151 acres, producing 164,300 quarts, an average of 1,088 quarts per acre; cranberries, 90 acres, producing 49,728 quarts, an average of 552 quarts per acre; currants, 32 acres, producing 37,080 quarts, an average of 1,159 quarts per acre; gooseberries, 30 acres, producing 41,230 quarts, an average of 1,374 quarts per acre; raspberries, 131 acres, producing 214,700 quarts, an average of 1,639 quarts per acre; other berries, 90 acres, producing 102,040 quarts, an average of 1,134 quarts per acre.

The same year there were cultivated in Maine, outside of potatoes and onions, 19,844 acres of miscellaneous vegetables, of which only 10,303 acres were reported in detail, but by distributing the remainder among the various kinds of vegetables grown in the same proportion as those reported, it would show approximately 16,000 acres of sweet corn, the larger part of which was taken by the canning factories, 1,100 acres of cabbages, 750 acres of turnips, 450 acres of cucumbers, 325 acres of green peas, 325 acres of tomatoes, and 900 acres of other vegetables.

Our returns indicate that since five years ago the products in many lines of small fruits and vegetables have been more than doubled. The reports were practically unanimous as to the large increase, also as to its cause, which is the constant increase in the summer tourist business.

The farmer who turns his attention to market gardening and raises what the proprietors of hotels and summer boarding houses demand, need have no fear of overstocking the market. The supply is not equal to the demand, and never has been. Besides, there is the great Boston market to fall back upon, where many of our gardeners send their products.

The reports received practically agree that the production of small fruits might be increased all along the line; also that vegetables of all kinds can be profitably raised in greater quantities. Maine produces the best apples, the best sweet corn, the best cucumbers, and the best potatoes. Its small fruits are the equal of those raised anywhere, and market gardening pays fair profits to those who intelligently make it a business.

Some complaint runs through the reports in regard to the scarcity of help, but this obstacle will probably be removed when the business becomes more permanently established.

In the transition state through which farming in Maine is now passing, the Maine farmer can face the future with hope and confidence. A great many old methods have been abandoned and more will follow, but the new lines adopted, as necessities require, are better and more profitable. Dairy farming is increasing year by year, and that it is profitable is proved by the prosperity attending those who have intelligently engaged in it. The apple crop is growing more valuable every year, and no better use can be found for land where corn and wheat can no longer be grown at a profit, than to plant it to apple trees. There never has been and probably never will be a surplus of sweet corn raised in the State for summer hotels and for canning purposes.

And now, last and best of all, the summer tourist business has brought the Boston and New York markets to our very doors, in the way of a demand for small fruits and garden vegetables. Our farmers are beginning to appreciate the possibilities of this industry, and all along our extended coast line market gardens are being made to yield the necessities of the summer menu, that formerly came from other states.

Let the West raise the beef, wheat and corn, while our Maine farmers supply the poultry, eggs, milk, cream, butter, apples, sweet corn, berries and vegetables, to our summer tourists and the inhabitants of our villages and cities, and they will be able to live in as comfortable and well furnished houses, and have as large bank accounts as their Western brethren.

The rural free delivery of mails, the extension of trolley lines, and the building of good roads, are factors in rendering the country as desirable for residences as the city; while the pure air, good water, freedom from conventionalities, and healthy outdoor employment, all tend to happiness and long life. A young man of intelligence and enterprise would undoubtedly have a surer prospect in life if he should engage in one of the occupations indicated above, than he would have in seeking his fortune in the city.

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, 1904, as compared with June 30, 1903.

Name of Road.	Number of employes, 1903.	Number of employes, 1904.	Total wages paid, 1903.	Total wages paid, 1904.	Average daily compensation, 1903.	Average daily compensation, 1904.
Bangor and Aroostook Railroad	1,334	1,331	$637,108 16	$695,104 49	$1 92	$1 96
Boston and Maine Railroad	857	869	536,876 22	578,215 22	1 97	2 06
Bridgton and Saco River Railroad*	48	44	21,508 80	20,799 39	1 52	1 51
Canadian Pacific Railway	461	847	278,729 63	307,961 87	2 06	1 97
Franklin and Megantic Railway*	61	61	25,629 77	26,097 09	1 48	1 56
Georges Valley Railroad	12	12	5,092 59	5,092 59	1 34	1 34
Grand Trunk Railway	757	684	451,227 19	415,042 63	1 87	1 88
Kennebec Central Railroad*	15	16	6,901 98	7,052 25	1 62	1 63
Lime Rock Railroad	43	45	20,822 22	20,816 43	2 05	2 06
Maine Central Railroad	3,477	3,544	1,875,896 25	2,017,874 47	1 84	1 89
Monson Railroad*	12	12	5,766 69	5,318 91	1 57	1 57
Phillips and Rangeley Railroad*	94	90	25,503 92	31,712 63	1 50	1 59
Portland and Rumford Falls Railway	332	244	159,855 14	147,341 14	1 78	1 82
Rumford Falls & Rangeley Lakes R.R.	113	84	55,145 48	44,190 76	1 62	1 65
Sandy River Railroad*	50	45	19,807 53	21,410 52	1 56	1 64
Sebasticook and Moosehead Railroad	26	34	8,333 17	9,289 52	1 30	1 37
Somerset Railway	75	75	37,775 63	39,568 04	1 69	1 76
Washington County Railroad	214	212	111,634 57	116,231 85	1 86	1 75
Wiscasset, Waterville & Farmington Railroad*	93	93	31,697 05	31,697 05	1 28	1 36
York Harbor and Beach Railroad	37	29	10,067 59	10,267 67	1 81	1 77
	8,111	8,371	$4,325,379 58	$4,551,084 52		

*Narrow (two feet) gauge.

RAILWAY EMPLOYES AND WAGES.

The number of employes, including general officers, upon steam railroads in Maine for the year ending June 30, 1903, was 8,111; for the year ending June 30, 1904, 8,371, an increase of 260. The number upon street railways for the year ending June 30, 1903, was 1,125; for the year ending June 30, 1904, 1,229, an increase of 104. The total number on both steam and street railways for the year ending June 30, 1903, was 9,236; for the year ending June 30, 1904, 9,600, an increase of 364.

The total amount of wages paid employes upon steam railroads in Maine for the year ending June 30, 1903, was $4,325,379.58; for the year ending June 30, 1904, $4,551,084.52, an increase of $225,704.94. The total amount paid employes upon street railways for the year ending June 30, 1903, was $553,500; for the year ending June 30, 1904, $698,017.28, an increase of $144,517.28. The total amount of wages paid on both steam and street railways for the year ending June 30, 1903, was $4,878,879.58; for the year ending June 30, 1904, $5,249,101.80, an increase of $370,222.22.

The total number of days worked by those employed upon steam railroads, including general officers, for the year ending June 30, 1903, was 2,327,137; for the year ending June 30, 1904, 2,395,711, an increase of 68,574.

The average daily wages of those employed upon steam railroads, including general officers, for the year ending June 30, 1903, was $1.86; not including general officers, $1.82. For the year ending June 30, 1904, including general officers, $1.90; not including general officers, $1.86. This increase of 4 cents in average daily wages to persons employed on steam railroads, not including general officers, amounted to $95,123.80 during the year ending June 30, 1904.

Railroad construction and operation furnishes a large field for the employment of labor. Nearly 10,000 persons are now employed in Maine in the operation of steam and electric railroads, and probably not less than 35,000 persons are wholly or partially dependent upon them for support.

GROSS EARNINGS AND TRAFFIC ON STEAM RAILROADS.

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; for the year ending June 30, 1904, $13,294,351.45, an increase of $635,503.08.

The number of passengers carried during the year ending June 30, 1903, was 6,993,046; for the year ending June 30, 1904, 7,342,049, an increase of 349,003. The number of tons of freight hauled for the year ending June 30, 1903, was 9,548,915; for the year ending June 30, 1904, 9,960,950, an increase of 412,035 tons.

The total passenger train mileage for the year ending June 30, 1903, was 4,192,828; for the year ending June 30, 1904, 4,304,200, an increase of 111,372 miles. The total freight train mileage for the year ending June 30, 1903, was 3,712,305; for the year ending June 30, 1904, 3,825,361, an increase of 113,056 miles. The total mileage of all trains, passenger, freight, mixed and non-revenue, for the year ending June 30, 1903, was 9,909,722; for the year ending June 30, 1904, 10,650,573, an increase of 740,851 miles.

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; on June 30, 1904, it was 2,018.60 miles, an increase of 13.79 miles. The actual gain was 16.79 miles, accounted for by the construction of the Eustis Railroad, operated by the Phillips and Rangeley Railroad, 15 miles, and the building of 1.79 miles by the Bangor and Aroostook Railroad. The railroad commissioners have dropped from the report the mileage of the Rockport Railroad, 3 miles, not now operated, which accounts for the difference between the actual gain and that shown over the report of 1903.

Of the 2,018.60 miles of steam railroad in the State, 1,826.03 miles are broad gauge, and 192.57 miles are narrow gauge. An extension of the Somerset Railway from Bingham to Dead Water, 8.50 miles, is nearly completed, and a further extension to Moxie pond will soon be put under construction.

MILEAGE OF STREET RAILWAYS IN MAINE.

The total mileage of the street railways in the State on June 30, 1903, was 345.16 miles; on June 30, 1904, 380.95 miles, an increase of 35.79 miles. This increase of mileage is made up from the building of the Waterville and Oakland Street Railway, 5.75 miles, from Waterville to Oakland; 9.18 additional miles of the Atlantic Shore Line Railway, from Biddeford to Kennebunkport; and 20.86 miles of the Portsmouth, Dover and York Street Railway, which connects its line with the Portsmouth, Kittery and York Street Railway and the Kittery and Eliot Street Railway, which two last named railways are owned and operated by the Portsmouth, Dover and York Street Railway.

It has often been claimed that railroad building in Maine has about come to an end. Sagacious business men, however, who have studied the possibilities of Maine's great resources, as yet but partially developed, believe that hundreds of miles of railroad will yet be constructed in the State, and in fact there is under contemplation the building of a considerable mileage in the near future. It may safely be concluded that Maine will continue to add to her steam and electric mileage for years to come, and thereby give additional employment to labor.

ACCIDENTS.

The total number of persons killed by the movement of trains on steam railroads, for the year ending June 30, 1903, was 50; of injured, 207, a total of killed and injured of 257. The total number of persons killed by the movement of trains on steam railroads, for the year ending June 30,1904, was 37; of injured, 125, a total of killed and injured of 162. Of the persons killed during the year ending June 30, 1903, 19 were employes, none were passengers, and 31 were classed as other persons; of the injured for the same year, 135 were employes, 28 were passengers, and 44 other persons. Of the persons killed during the year ending June 30, 1904, 20 were employes, 1 was a passenger, and 16 other persons; of the injured for the same year, 94 were employes, 15 were passengers, and 16 other persons.

For the year ending June 30, 1904, of trainmen there was 1 killed to every 127 employed, and 1 injured to every 22

employed. In coupling and uncoupling cars 13 trainmen were killed and 74 injured.

Accidents on steam railroads arising from causes other than from the movement of trains, locomotives or cars, for the year ending June 30, 1903, resulted in the injury of 119 persons, 22 of whom were stationmen, 35 were shopmen, 22 were trackmen, and 40 were other employes. Similar accidents for the year ending June 30, 1904, resulted in 1 death and the injury of 134 persons, a total of killed and injured of 135. Of the injured, 6 were stationmen, 34 were shopmen, 43 were trackmen, and 51 were other employes.

During the ten years prior to June 30, 1904, the number of employes killed on Maine steam railroads was 127; injured, 1,037. Passengers killed, 18; injured, 276. Other persons killed, 188; injured, 318, making a total of 333 killed, and 1,631 injured for the ten years, or an annual average of 33.3 persons killed, and 163.1 persons injured.

The total number of persons killed upon street railways for the year ending June 30, 1903, was 7; of injured, 40, a total of killed and injured of 47. The total number of persons killed upon street railways for the year ending June 30, 1904, was 5; of injured, 51, a total of killed and injured of 56. Of the persons killed during the year ending June 30, 1903, 2 were passengers, and 5 were other persons; of the injured, 36 were passengers, and 4 were other persons. Of the 5 persons killed during the year ending June 30, 1904, all were classed as other persons; of the injured, 39 were passengers, and 12 were other persons.

STRIKES IN MAINE, 1881-1900.

In 1887 the United States Commissioner of Labor completed his first investigation of strikes in the United States, covering the period from January 1, 1881, to December 31, 1886. Eight years later he made further investigations covering the period from January 1, 1887, to June 30, 1894, and in 1901 he completed the investigation up to December 31, 1900. We here give a brief synopsis of the strikes which occurred in Maine during the periods named.

During the twenty years from 1881 to 1900 inclusive there occurred in the State of Maine 172 strikes, not including the 2 general strikes of July 19, 1883, in New York, and March 1, 1900, in Massachusetts. Of this number two occurred in 1881, two in 1882, two in 1883, three in 1884, eight in 1885, twenty-one in 1886, twelve in 1887, seven in 1888, eight in 1889, twenty-eight in 1890, six in 1891, six in 1892, ten in 1893, two in 1894, nine in 1895, nine in 1896, eight in 1897, eight in 1898, ten in 1899, and eleven in 1900. Of the total number, 87 were ordered by labor organizations, and 85 not so ordered.

The number of establishments closed was 110; aggregate number of days closed, 3,900; average days closed, 35.5.

The number of establishments involved was 254. The aggregate number of days until strikers were re-employed or their places filled by others, in the 254 establishments, was 6,322, an average of 24.9 to an establishment. The number of establishments in which strikes succeeded was 71; succeeded partly, 38; failed, 145. The loss in wages to employes in all the establishments was $1,426,906; loss to employers, $269,784. The strikers received assistance to the amount of $77,210. The total number of hands employed at the time strikes were inaugurated was 68,799, of whom 45,259 were males, and 23,540 were females. The total number actually participating in strikes was 16,335, throwing 33,961 out of employment, of whom 22,703

were males, and 11,258 were females. The total number of new employes after the strikes was 3,354, of whom 2,847 were males, and 507 were females. Of the new employes, 1,742 were brought from other places.

In the 254 establishments there were assigned 46 different causes of strikes. The separate causes of strikes, the number of establishments involved in each cause, and the success or failure of such strikes, were as follows:

Against accepting firm's terms on new article of manufacture, establishments, 1; succeeded, 1.

Against adoption of proposed scale, establishments, 6; failed, 6.

Against being compelled to carry material to place of work, establishments, 1; failed, 1.

Against change from day to piece work, establishments, 1; succeeded, 1.

Against change from pay by the day to pay by the hour, establishments, 2; failed, 2.

Against change from piece to day work, establishments, 1; failed, 1.

Against discharge of union employes, establishments, 1; failed, 1.

Against employment of additional apprentices, establishments, 1; failed, 1.

Against employment of certain nationalities, establishments, 1; failed, 1.

Against employment of non-union men, establishments, 15; succeeded, 11; failed, 4.

Against employment of obnoxious person, establishments, 1; succeeded, 1.

Against increase of amount of work required to be done, establishments, 1; failed, 1.

Against increase of hours, establishments, 4; failed, 4.

Against introduction of machinery, establishments, 6; failed, 6.

Against introduction of machinery and reduction of wages, establishments, 1; succeeded partly, 1.

Against lasters furnishing their own tacks and pegs, establishments, 1; failed, 1.

Against McKay stitchers being compelled to furnish their own needles, establishments, 1; failed, 1.

Against poor quality of material, establishments, 2; failed, 2.

Against reduction of wages, establishments, 21; succeeded, 4; succeeded partly, 1; failed, 16.

Against system of measuring work, establishments, 1; succeeded, 1.

Against use of machine-made material, establishments, 1; failed, 1.

Against violation of agreement, establishments, 1; failed, 1.

Against working on job with non-union employes under another contractor, establishments, 2; failed, 2.

For adoption of union, etc., scale, establishments, 1; succeeded, 1.

For adoption of union scale, establishments, 1; succeeded, 1.

For discharge of foreman, establishments, 1; failed, 1.

For discharge of non-union employes, establishments, 1; failed, 1.

For enforcement of union rules, establishments, 1; succeeded, 1.

For fortnightly payments, establishments, 1; succeeded, 1.

For increase of force, establishments, 1; failed, 1.

For increase of wages, establishments, 95; succeeded, 29; succeeded partly, 10; failed, 56.

For increase of wages and adoption of uniform scale, establishments, 2; failed, 2.

For increase of wages and discharge of employes, foremen, etc., establishments, 1; failed, 1.

For increase of wages and recognition of union, establishments, 1; failed, 1.

For increase of wages and reduction of hours, establishments, 25; succeeded, 3; succeeded partly, 21; failed, 1.

For increase of wages and reduction of hours on Saturday, establishments, 2; succeeded partly, 2.

For pay for extra work, establishments, 1; failed, 1.

For payment of wages overdue, establishments, 4; succeeded, 4.

For recognition of union, establishments, 1; failed, 1.

For reduction of hours, establishments, 29; succeeded, 11; succeeded partly, 2; failed, 16.

For reduction of hours on Saturday, establishments, 1; failed, 1.

For regular payment, establishments, 2; succeeded, 1; failed, 1.

For reinstatement of discharged employes, establishments, 4; failed, 4.

For reinstatement of discharged employes, foremen, etc., establishments, 2; failed, 2.

For reinstatement of discharged foreman, establishments, 1; failed, 1.

In sympathy with strike elsewhere, establishments, 3; succeeded partly, 1; failed, 2.

During the twenty years there were 17 different industries engaged in strikes, besides a few others classed under the head of miscellaneous, as follows:

Boots and shoes, 35 strikes, 24 of which were ordered by labor organizations, and 11 were not. Amount of wages lost by employes, $431,033; assistance received, $9,445; loss of employers, $171,205.

Building trades, 8 strikes, 4 of which were ordered by labor organizations, and 4 were not. Amount of wages lost by employes, $5,084; no assistance received; loss of employers, $2,219.

Cotton and woolen goods, 1 strike, not ordered by labor organization. Amount of wages lost by employes, $150; no assistance received; loss of employers, $40.

Cotton goods, 30 strikes, 5 of which were ordered by labor organizations, and 25 were not. Amount of wages lost by employes, $551,465; assistance received, $2,000; loss of employers, $104,000.

Food preparations, 3 strikes, none ordered by labor organizations. Amount of wages lost by employes, $10,300; no assistance received; loss of employers, $1,150.

Lumber, 8 strikes, 4 of which were ordered by labor organizations, and 4 were not. Amount of wages lost by employes, $17,385; assistance received, $320; loss of employers, $11,300.

Machines and machinery, 4 strikes, 3 of which were ordered by labor organizations, and 1 was not. Amount of wages lost by employes, $32,150; assistance received, $6,900; loss of employers, $3,275.

Metals and metallic goods, 3 strikes, all of which were ordered by labor organizations. Amount of wages lost by employes, $5,161; assistance received, $450; loss of employers, $1,000.

Paper and paper goods, 1 strike, not ordered by labor organization. Amount of wages lost by employes, $34; no assistance received, and no loss of employers.

Public ways construction, 1 strike, not ordered by labor organization. Amount of wages lost by employes, $3,500; no assistance received, and no loss of employers.

Public works construction, 2 strikes, 1 of which was ordered by labor organization, and 1 was not. Amount of wages lost by employes, $249; no assistance received; loss of employers, $75.

Shipbuilding, etc., 12 strikes, 7 of which were ordered by labor organizations, and 5 were not. Amount of wages lost by employes, $36,508; assistance received, $200; loss of employers, $6,650.

Stone quarrying and cutting, not including the general strike of March 1, 1900, in Massachusetts, 34 strikes, 27 of which were ordered by labor organizations, and 7 were not. Amount of wages lost by employes, $267,729; assistance received, $54,302; loss of employers, $34,190.

Telegraph and telephone, not including the general strike of July 19, 1883, in New York, 1 strike, not ordered by labor organization. Amount of wages lost by employes, $160; no assistance received; loss of employers, $400.

Tobacco, 6 strikes, 4 of which were ordered by labor organizations, and 2 were not. Amount of wages lost by employes, $5,891; assistance received, $1,986; loss of employers, $710.

Transportation, 4 strikes, 1 of which was ordered by labor organization, and 3 were not. Amount of wages lost by employes, $10,600; no assistance received; loss of employers, $1,650.

Woolen and worsted goods, 11 strikes, 1 of which was ordered by labor organization, and 10 were not. Amount of wages lost by employes, $16,633; assistance received, $450; loss of employers, $21,445.

Miscellaneous, 8 strikes, 3 of which were ordered by labor organizations, and 5 were not. Amount of wages lost by employes, $32,874; assistance received, $1,157; loss of employers, $10,475.

LABOR UNIONS.

Our efforts the present year have been to obtain, so far as possible, a complete list of local unions in the State, without any attempt to go into details as we have in past years. We here present a revised list which shows an increase of 83 unions over the number reported to us one year ago, many of which are newly organized. In cases where we have received no recent reports we have given the number of members as they stood last year. In most cases the names of secretaries given are those of 1903, as our report goes to press too early to include those for 1904. We add a list of state and central unions.

BARBERS.

Augusta. Journeymen Barbers' International Union of America, No. 493; secretary, Fred Willett, 1 Bridge street; number of members, 24.

Bangor. Journeymen Barbers' International Union of America, No. 211; secretary, William F. Ahearn, 95 Pickering square; number of members, 45.

Lewiston. Journeymen Barbers' International Union of America; secretary, M. J. Cook, 185 Lisbon street.

Portland. Journeymen Barbers' International Union of America, No. 210; secretary, J. H. DeCosta, 478½ Congress street; number of members, 20.

Rumford (Falls). Journeymen Barbers' International Union of America; number of members, 20.

BOOT AND SHOE WORKERS.

Auburn. Boot and Shoeworkers' Union, No. 225; secretary, William J. Ryan, 29 Summit street; number of members, 125.

Bangor. Local Union of Shoe Workers, No. 304; number of members, 50.

Belfast. Boot and Shoeworkers' Union, No. 362; secretary, John S. Davidson, Box 34; number of members, 200.

Calais. Boot and Shoeworkers' Union, No. 355; secretary, Albert Burns, Box 263; number of members, 210.

Ellsworth. Boot and Shoeworkers' Union, No. 344; secretary, U. L. Royal, Box. 129.

Hallowell. Boot and Shoeworkers' Union.

Mechanic Falls. Boot and Shoeworkers' Union, No. 349; secretary, J. G. Noyes; number of members, 100.

Portland. Boot and Shoeworkers' Union; secretary, H. C. Gaylord, 43 Oxford street.

Sanford (Springvale). Boot and Shoeworkers' Union, No. 215; secretary, C. W. Goodwin; number of members, 200.

BUILDERS.

Carpenters.

Augusta. United Brotherhood of Carpenters and Joiners of America, No. 914; secretary, Ira H. Foster, 10 Chapel street; number of members, 120.

Bangor. United Brotherhood of Carpenters and Joiners of America, No. 621; secretary, William H. Costello, 7 Holyoke street, Brewer; number of members, 264.

Bath. United Brotherhood of Carpenters and Joiners of America, No. 1,663; secretary, S. J. Ewell, 1 Freemont street; number of members, 57.

Biddeford. United Brotherhood of Carpenters and Joiners of America; number of members, 50.

Eden (Bar Harbor). United Brotherhood of Carpenters and Joiners of America, No. 459; secretary, Henry M. Smith, Forest street; number of members, 80.

Gardiner. United Brotherhood of Carpenters and Joiners of America, No. 1,259; secretary, M. F. Merrow, 5 F street, Randolph; number of members, 38.

Jay (Chisholm). United Brotherhood of Carpenters and Joiners of America, No. 1,669; secretary, C. B. Quimby, Livermore Falls post office.

Lewiston. United Brotherhood of Carpenters and Joiners of America; secretary, A. M. Flagg, 94 Spring street, Auburn; number of members, 100.

Madison. United Brotherhood of Carpenters and Joiners of America, No. 1,031; secretary, C. F. Dunbar; number of members, 45.

Millinocket. United Brotherhood of Carpenters and Joiners of America, No. 1,707; secretary, William Herlihy; number of members, 29.

Portland. United Brotherhood of Carpenters and Joiners of America, No. 517; secretary, F. L. Foote, 157 Franklin street; number of members, 100.

Rumford (Falls). United Brotherhood of Carpenters and Joiners of America, No. 1,189; secretary, J. C. Curtis, Box 1,202; number of members, 125.

Skowhegan. United Brotherhood of Carpenters and Joiners of America, No. 787; secretary, John B. Taylor; number of members, 70.

Waterville. United Brotherhood of Carpenters and Joiners of America, No. 348; secretary, Henry Hamm, 14 Abbott street; number of members, 63.

Masons.

Augusta. Bricklayers, Masons and Plasterers' Union, No. 9; secretary, Abner W. Nichols, 16 Pine street; number of members, 45.

Bangor. Bricklayers, Masons and Plasterers' Union, No. 7; secretary, Walter C. Sturtevant, 13 Jackson street; number of members, 70.

Biddeford. Bricklayers and Plasterers' Union, No. 14; secretary, Fred B. Cobb, Highland street; number of members, 44.

Brunswick, transferred from Bath. Bricklayers, Masons and Plasterers' Union, No. 6; secretary, E. A. Hammond, Bath street, Row 3; number of members, 30.

Eden (Bar Harbor). Bricklayers, Masons and Plasterers' Union, No. 4; secretary, W. E. Braun; number of members, 70.

Gardiner. Bricklayers, Masons and Plasterers' Union, No. 12; secretary, E. E. Brookings, R. F. D. No. 12; number of members, 22.

Lewiston. Bricklayers, Masons and Plasterers' Union, No. 1; secretary, M. F. Pettingill, 10 Lowell street; number of members, 118.

Old Town. Bricklayers, Masons and Plasterers' Union, No. 13; secretary, Joseph Eastman, Box 13.

Portland. Bricklayers' Protective Union, No. 2; secretary, Stillman Bragan, 460 Brown street, South Portland; number of members, 100.

Rumford (Falls). Bricklayers, Masons and Plasterers' Union, No. 10; secretary, J. H. Dennis, Box 687; number of members, 50.

Skowhegan. Bricklayers, Masons and Plasterers' Union, No. 11; secretary, T. A. Gould, 38 North street; number of members, 30.

Waterville. Bricklayers, Masons and Plasterers' Union, No. 8; secretary, E. Bysom Witham, 195 Main street; number of members, 65.

Masons' Tenders.

Auburn. International Hod Carriers and Building Laborers of America, No. 110; secretary, Gideon Villie, 10 Second street.

Augusta. International Hod Carriers and Laborers of America, No. 96; secretary, George LePlante; number of members, 20.

Bangor. Building Laborers' Protective Union, No. 1; secretary, Thomas McGoff, Frazier street; number of members, 40.

Lewiston. International Hod Carriers and Building Laborers of America, No. 1,272; number of members, 30.

Portland. Bricklayers Tenders' Union, No. 9,231; number of members, 125.

Portland. International Hod Carriers and Building Laborers of America, No. 8; secretary, James Sweeney, 5 Horton Place.

Lathers.

Portland. Wood, Wire and Metal Lathers' Union; number of members, 50.

Roofers.

Bangor. Slate, Gravel and Metal Roofers' Union, No. 10,229; secretary, C. A. Burrill, 220 Garland street; number of members, 12.

Plumbers.

Auburn. Journeymen Plumbers, Gas and Steamfitters and Steamfitters' Helpers; secretary, William H. Kuhn, 54 Court street.

Bangor. Journeymen Plumbers, Gas and Steamfitters and Steamfitters' Helpers, No. 209; secretary, L. J. Gleason, 358 Hancock street; number of members, 30.

Biddeford. Journeymen Plumbers, Gas and Steamfitters and Steamfitters' Helpers; number of members, 20.

Eden (Bar Harbor). Journeymen Plumbers, Gas and Steamfitters and Steamfitters' Helpers, No. 416; secretary, F. L. Roberts; number of members, 15.

Portland. Journeymen Plumbers, Gas and Steamfitters and Steamfitters' Helpers, No. 17; secretary, Iver Iverson, 153 Federal street; number of members, 40.

Rumford (Falls). Journeymen Plumbers, Gas and Steamfitters and Steamfitters' Helpers; number of members, 23.

Panters, Decorators and Paperhangers.

Augusta. Brotherhood of Painters, Decorators and Paperhangers of America, No. 554; secretary, Arno Harris; number of members, 36.

Bangor. Brotherhood of Painters, Decorators and Paperhangers of America, No. 262; secretary, Charles H. Pierce, 184 Union street; number of members, 117.

Bath. Brotherhood of Painters, Decorators and Paperhangers of America, No. 943; secretary, Charles Mains, 4 Walker street; number of members, 50.

Biddeford. Brotherhood of Painters, Decorators and Paperhangers of America; number of members, 45.

Eden (Bar Harbor). Brotherhood of Painters, Decorators and Paperhangers of America, No. 142; secretary, J. A. Stevens, 18 Maple avenue; number of members, 80.

Gardiner. Brotherhood of Painters, Decorators and Paperhangers of America, No. 1,048; secretary, Frank Curry; number of members, 34.

Lewiston. Brotherhood of Painters, Decorators and Paperhangers of America, No. 854; secretary, H. Annis; number of members, 50.

Portland. Brotherhood of Painters, Decorators and Paperhangers of America, No. 237; secretary, Charles L. Fox, 10 Free street; number of members, 30.

Rumford (Falls). Brotherhood of Painters, Decorators and Paperhangers of America; secretary, Herbert Clench; number of members, 50.

Skowhegan. Brotherhood of Painters, Decorators and Paperhangers of America, No. 648; secretary, Fred C. Hollis; number of members, 27.

CIGARMAKERS.

Bangor. Cigarmakers' International Union of America, No. 179; secretary, A. Scherer, 99 Birch street, Box 685; number of members, 60.

Biddeford. Cigarmakers' International Union of America, No. 40; secretary, Milton J. Ibach, 146 Elm street; number of members, 27.

Lewiston. Cigarmakers' International Union of America, No. 66; secretary, C. H. McCarron, 64 Lisbon street; number of members, 69.

Portland. Cigarmakers' International Union of America, No. 470; secretary, James J. Mullin, 80 India street; number of members, 10.

Rockland. Cigarmakers' International Union of America; secretary, S. Goldberg.

COTTON GOODS.

Carders.

Augusta. Carders' Union, No. 334; secretary, J. S. Cartiledge, 145 Jefferson street; number of members, 80.

Mule Spinners.

Augusta. Mule Spinners' Union, No. 5; secretary, Emil Maurice, Kendall street; number of members, 4.

Brunswick. Mule Spinners' Union, No. 16; secretary, Joseph Carling, 63 Union street; number of members, 14.

Lewiston. Cotton Mule Spinners' Association, No. 4; secretary, William J. Crowell, 244 Lincoln street; number of members, 80.

Waterville. Mule Spinners' Union, No. 15; secretary, M. J. Lahey, Box 140.

Weavers.

Augusta. United Textile Workers of America, No. 347; secretary, Louis Paquin, 143 Cony street; number of members, 250.

Skowhegan. United Textile Workers of America, No. 477; secretary, John F. Bresett, Box 1,001; number of members, 45.

Slasher Tenders.

Biddeford. Slasher Tenders' Union; number of members, 25.

Loomfixers.

Augusta. Loomfixers' Union, No. 330; secretary, E. L. Kingsley; number of members, 27.

Biddeford. Saco and Biddeford Loomfixers' Union, No. 54; secretary, Charles H. Coburn, Saco; number of members, 25.

CLOTHING MAKERS.

Augusta. Suspender Workers' Union, No. 11,095; secretary, Elden W. Hanks; number of members, 8.

Bangor. Journeymen Tailors' Union, No. 336; number of members, 20.

Millinocket. Shirtwaist and Laundry Workers' Union, No. 20; secretary, Julia B. Bragdon; number of members, 17.

Norridgewock. National Garment Workers of America, No. 85; secretary, Belle C. Adams; number of members, 72.

ELECTRICAL WORKERS.

Bangor. International Brotherhood of Electrical Workers, No. 349; number of members, 12.

Millinocket. International Brotherhood of Electrical Workers, No. 471; secretary, W. Lyon.

Portland. International Brotherhood of Electrical Workers, No. 399; secretary, W. J. Ingersoll, 3 C street, Knightville.

GRANITE WORKERS.

Quarrymen's Unions.

(Black Island). Quarry Workers' International Union of North America, Branch No. 53; secretary, Sumner Merrill, care of Gott Island.

Bluehill. Quarry Workers' International Union of North America, Branch No. 17; secretary, Ed. McIntire.

Bluehill (East). Quarry Workers' International Union of North America, Branch No. 8; secretary, Herman Gray; number of members, 70.

Calais (Red Beach). Quarry Workers' International Union of North America.

Frankfort. Quarry Workers' International Union of North America.

Franklin. Quarry Workers' International Union of North America.

Hallowell. Quarry Workers' International Union of North America, Branch No. 29; secretary, C. V. Gipson, R. F. D. No. 8; number of members, 50.

(High Island). Quarry Workers' International Union of North America, Branch No. 11; secretary, James O'Connor, Box 279, Rockland.

Hurricane Isle. Quarry Workers' International Union of North America, Branch No. 37; secretary, H. C. Vinal.

Jay (North). Quarry Workers' International Union of North America, Branch No. 4; secretary, James Stevenson, North Jay; number of members, 50.

Mount Desert (Hall Quarry). Quarry Workers' International Union of North America, Branch No. 7; secretary, Elbert Richardson; number of members, 37.

St. George (Clark Island). Quarry Workers' International Union of North America.

South Thomaston (Sprue Head). Quarry Workers' International Union of North America, Branch No. 67; secretary, Ira J. Colman, Spruce Head; number of members, 9.

Sullivan (North). Quarry Workers' International Union of North America, Branch No. 52; secretary, Frank K. Allen; number of members, 65.

Vinalhaven. Quarry Workers' International Union of North America, Branch No. 55; secretary, William Murch; number of members, 104.

Waldoboro. Quarry Workers' International Union of North America, Branch No. 9; secretary, W. F. B. Feyler; number of members, 65.

Granite Cutters.

Bangor. Granite Cutters' National Union; shop steward, Martin Coyne, 31 Otis street.

Bluehill. Bluehill Granite Cutters' National Union; number of members, 23.

Calais (Red Beach). Red Beach Branch Granite Cutters' National Union; secretary, Frank Smith; number of members, 35.

Eden (Bar Harbor). Granite Cutters' National Union; shop steward, W. B. Rowe, 18 York street.

Frankfort. Mount Waldo Branch Granite Cutters' National Union; secretary, W. W. Clark, Box 187; number of members, 150.

Franklin. Granite Cutters' National Union; secretary, J. H. Bunker.

Hallowell. Hallowell Branch Granite Cutters' National Union; secretary, J. B. Haskins, Box 882; number of members, 184.

(High Island). Granite Cutters' National Union; shop steward, M. J. Maddigan, South Thomaston.

Hurricane Isle. Granite Cutters' National Union; secretary, Thomas F. Murray; number of members, 109.

Jay (North). Granite Cutters' National Union; secretary, Carl Hall, Box 215, Wilton; number of members, 81.

Jonesport. Granite Cutters' National Union; shop steward, R. L. Mills, Head Harbor Island.

Lewiston. Granite Cutters' National Union; secretary, T. W. Murphy, 52 Summer street; number of members, 27.

Mount Desert (Hall Quarry). Granite Cutters' National Union; secretary, George W. Silver, Mount Desert.

Norridgewock (South). Granite Cutters' National Union; shop steward, W. P. Gilman; number of members, 8.

Portland. Portland Branch Granite Cutters' National Union; secretary, J. C. Hutcherson, 8 Devon street, Woodfords; number of members, 60.

South Thomaston (Spruce Head). Spruce Head Branch Granite Cutters' National Union; secretary, John E. Williamson; number of members, 64.

St. George (Clark Island). Clark Island Branch Granite Cutters' National Union; secretary, W. G. Rogers; number of members, 45.

Stonington. Stonington Branch Granite Cutters' National Union; secretary, Lyman E. Stinson, R. F. D. No. 1; number of members, 187.

Sullivan (North). North Sullivan Branch Granite Cutters' National Union; secretary, George F. Colson; number of members, 50.

Vinalhaven. Granite Cutters' National Union; secretary, Thomas J. Lyons; number of members, 135.

Waldoboro. Granite Cutters' National Union; secretary, H. G. Johnson, Box 55; number of members, 125.

Waterville. Granite Cutters' National Union; shop steward, Peter King, 8 East Temple street.

Paving Cutters.

Calais (Red Beach). Paving Cutters' Union.

Hurricane Isle. Paving Cutters' Union; number of members, 19.

Mount Desert (Hall Quarry). Paving Cutters' Union of United States and Canada, No. 26; secretary, H. L. Perkins; number of members, 40.

South Thomaston (Spruce Head). Paving Cutters' Union.

St. George (Clark Island). Paving Cutters' Union.

Stonington. Paving Cutters' Union.

Sullivan (North). Paving Cutters' Union.

Vinalhaven. Paving Cutters' Union.

Waldoboro. Paving Cutters' Union.

LIME WORKERS.

Rockland. Lime Burners' Union, No. 11,754; secretary, Charles Harriman, 7 Broad street.

Rockland. Lime Workers' Union.

IRON WORKERS.

Blacksmiths.

Rumford (Falls). Blacksmiths' Union; number of members, 10.

Sheet Metal Workers.

Bangor. Amalgamated Association of Sheet Metal Workers, No. 34; secretary, Walter P. Robinson, 14 Davis street.

Portland. Sheet Metal Workers; secretary, Fred P. Shamming, 191 Franklin street.

Foundry Workers.

Bangor. Foundry Workers' Union; secretary, Edward Kenney, 28 Pine street.

Brewer (South). Foundry Workers' Union, No. 1,538; secretary, C. H. Townes, 4 Hillside avenue, Bangor; number of members, 9.

Iron Moulders.

Bangor. Iron Moulders' Union of North America, No. 101; secretary, George Townsend, 417 Main street; number of members, 37.

Bath. Iron Moulders' Union of North America; number of members, 30.

Biddeford. Iron Moulders' Union of North America, No. 288; secretary, A. D. Annett, Box 1,151, Saco; number of members, 130.

Lewiston. Iron Moulders' Union of North America; secretary, J. J. Kennedy, City Farm, Lewiston; number of members, 40.

Portland. Iron Moulders' Union of North America, No. 248; secretary, John J. A. Halpin; number of members, 50.

Stove Mounters.

Bangor. Stove Mounters' Union, No. 50; secretary, Edwin Kenney, 28 Pier street; number of members, 20.

Boiler Makers.

Portland. Brotherhood of Boiler Makers, No. 142; secretary, J. A. Schelly, 39 Hammond street.

Machinists.

Bangor. Machinists' Union, No. 494; secretary, J. H. Furnegan, 104 Franklin street; number of members, 10.

Bath. International Association of Machinists, Lodge No. 466; secretary, A. G. Merrill, 644 Washington street; number of members, 16.

Kittery. International Association of Machinists, No. 697; secretary, J. Meats, 1½ Dover street.

Portland. International Association of Machinists, Oriental Lodge, No. 216; secretary, R. P. Swan, 95 India street; number of members, 40.

Rumford (Falls). International Association of Machinists, Andrew Schogan Lodge, No. 522; secretary, T. D. Walsh; number of members, 12.

LABORERS.

Laborers' Protective Unions.

Jay (Chisholm). Laborers' Protective Union, No. 9,555; number of members, 350.

Mexico (Ridlonville). Laborers' Protective Union, No. 9,545; secretary, William Clear.

Rockland. International Laborers' Union, No. 196; number of members, 219.

Skowhegan. Laborers' Protective Union, No. 10,191; secretary, M. P. Solley, 64 Mt. Pleasant avenue; number of members, 182.

Federal Labor Unions.

Augusta. Augusta Federal Union, No. 11,434; secretary, Ross B. Nichols; number of members, 45.

Bangor. Federal Labor Union, No. 9,646; secretary, Michael Callan, 69 Second street; number of members, 75.

Eden (Bar Harbor). Federal Labor Union, No. 10,651; secretary, Burton Day, 48 Eden street; number of members, 500.

Gardiner. Federal Labor Union, No. 11,185; secretary, Thomas B. McMann, R. F. D. No. 10; number of members, 54.

Hallowell. Federal Labor Union, No. 10,919; secretary, George W. Varney, 38 Academy street.

Kittery. Federal Labor Union, No. 9,573; secretary, J. E. Burnham, Box 126.

Madison. Federal Labor Union, No. 11,643; secretary, E. C. Blackwell, Box 235; number of members, 220.

Millinocket. Federal Labor Union, No. 11,311; secretary, J. E. Sutherland; number of members, 23.

Van Buren. Federal Labor Union, No. 11,204; secretary, George J. Keegan.

PRINTERS AND BINDERS.

Typographical Unions.

Augusta. Augusta Typographical Union, No. 380; secretary, L. V. Clark; number of members, 60.

Bangor. Bangor Typographical Union, No. 446; secretary, John F. Connelly, Box 784; number of members, 40.

Biddeford. Biddeford Typographical Union; number of members, 15.

Lewiston. Lewiston Typographical Union, No. 532; secretary, C. D. Chadbourne, 223 Lisbon street; number of members, 45.

Portland. Portland Typographical Union, No. 66; secretary, Arthur Ingersoll, 96 Vesper street; number of members, 80.

Pressmen.

Portland. Printing Pressmen's Union, No. 22; secretary, T. J. Magner, 20 Deer street; number of members, 50.

Binders.

Portland. Bookbinders' Union; secretary, George R. Shaw, rear of 19 Eastern promenade.

PULP AND PAPER MAKERS.

Pulp, Sulphite and Papermill Workers.

Brewer (South). Pulp, Sulphite and Papermill Workers' Union, No. 36; secretary, Joseph Arsenault, 232 Hammond street, Bangor; number of members, 36.

East Livermore (Livermore Falls). Pulp Sulphite and Papermill Workers' Union, No. 18; secretary, B. M. Tretheway.

Gardiner (South). Pulp, Sulphite and Papermill Workers' Union, Lodge No. 40; secretary, Joseph F. Burgess.

Lisbon (Falls). Pulp, Sulphite and Papermill Workers' Union, No. 26; secretary, W. C. Winn.

Madison. Pulp, Sulphite and Papermill Workers' Union, No. 37; secretary, Elmer Nute.

Millinocket. Pulp, Sulphite and Papermill Workers' Union, No. 25; secretary, Robert J. Sweetland; number of members, 600.

Orono. Pulp, Sulphite and Papermill Workers' Union, No. 38; secretary, George A. King.

Rumford (Falls). Pulp, Sulphite and Papermill Workers' Union, No. 16; secretary, John Gallant; number of members, 850.

Solon. Pulp, Sulphite and Papermill Workers' Union, No. 53; secretary, Walter W. Knowles, Box 190; number of members, 30.

Papermakers.

Augusta. International Brotherhood of Papermakers, No. 35; secretary, Handley Chute, 10 Willow street; number of members, 54.

Brewer (South). International Brotherhood of Papermakers, Penobscot Lodge, No. 82; secretary, R. L. Bates, North Orrington; number of members, 20.

Brunswick. International Brotherhood of Papermakers, No. 86; secretary, George Rogers, Topsham.

East Livermore (Livermore Falls). International Brotherhood of Papermakers, No. 11; secretary, Daniel Dwyer, Chisholm; number of members, 65.

Gardiner. International Brotherhood of Papermakers, Cobbossee Lodge, No. 132; secretary, Linwood Grover.

Gardiner. International Brotherhood of Papermakers, Dirigo Lodge, No. 84; secretary, Miss Margaret E. Murray, 30½ Winthrop place, Augusta; number of members, 165.

Lisbon (Falls). International Brotherhood of Papermakers, Androscoggin Lodge, No. 15; secretary, Joseph Croten; number of members, 40.

Madison. International Brotherhood of Papermakers, Kennebec Local, No. 73; secretary, William E. Forren, Box 13.

Millinocket. International Brotherhood of Papermakers, No. 27; secretary, D. A. Chaplin.

Orono. International Brotherhood of Papermakers, No. 83.

Rumford (Falls). International Brotherhood of Papermakers, No. 9; secretary, Nicholas J. Hogan.

Waterville. International Brotherhood of Papermakers, College City Lodge, No. 109; secretary, W. Priest, Box 208.

Paper Bag Mill Workers.

Rumford (Falls). Paper Bag Mill Workers' Union, No. 10,658; secretary, Amanda Haines, 205 York street.

Paper Box Machine Operators.

Rumford (Falls). Paper Box Machine Operators' Union, No. 11,190; secretary, Robert A. Allen, Lackness Road.

RAILWAY EMPLOYES.

Railway Conductors.

Bangor. Bangor Division, Order of Railway Conductors, No. 403; number of members 55.

Portland. Order of Railway Conductors, Pine Tree Division, No. 66; number of members, 125.

Locomotive Engineers.

Bangor. Brotherhood of Locomotive Engineers, Ticonic Division, No. 508; secretary, T. J. Ferry, 36 Walter street; number of members, 90.

Brownville (Henderson). Brotherhood of Locomotive Engineers, Pleasant River Division, No. 440; secretary, M. I. Spaulding; number of members, 26.

Calais. Brotherhood of Locomotive Engineers, Sunrise Division; secretary, W. J. Boothby, 63 Dillingham street, Milltown.

Houlton. Brotherhood of Locomotive Engineers, Grindstone Division, No. 588; secretary, John O'Leary, Box 370; number of members, 45.

Portland. Brotherhood of Locomotive Engineers, Division No. 40; secretary, George W. Babb, F. A. E., 877 Congress street; number of members, 145.

Locomotive Firemen.

Bangor. Brotherhood of Locomotive Firemen, Penobscot Division, No. 514; secretary, Joseph F. Ferry, 20 Birch street; number of members, 75.

Brownville (Henderson). Brotherhood of Locomotive Firemen, Mt. Katahdin Division, No. 469; secretary, C. I. Cargill; number of members, 32.

Houlton. Brotherhood of Locomotive Firemen, Pine Cone Division, No. 587; secretary, Glen Smith; number of members, 164.

Portland. Brotherhood of Locomotive Firemen, Great Eastern Division, No. 4; secretary, A. F. Ross, 47 Anderson street; number of members, 108.

Railroad Trainmen.

Bangor. Brotherhood of Railroad Trainmen, No. 443; secretary, A. D. Cutting, 6 Lincoln street; number of members, 100.

Brownville (Henderson). Brotherhood of Railroad Trainmen, No. 366; number of members, 50.

Houlton. Brotherhood of Railroad Trainmen, Aroostook Lodge, No. 303; number of members, 78.

Portland. Brotherhood of Railroad Trainmen, No. 82; number of members, 400.

Waterville. Brotherhood of Railroad Trainmen, No. 343; number of members, 70.

Railroad Telegraphers.

Bangor. Order of Railroad Telegraphers, Old Town Division, No. 11; secretary, B. A. Brackett, 32 Coombs street; number of members, 300.

Portland. Order of Railroad Telegraphers, Portland Division, No. 95; secretary, S. L. Read, Box 2, Bar Mills.

Car Inspectors and Repairers.

Portland. Car Inspectors and Repairers' Union; secretary, W. N. Whitehouse, 2 Douglass street; number of members, 50.

Railroad Freight Handlers.

Portland. Brotherhood of Railroad Freight and Baggagemen, No. 75; secretary, C. B. Googins, 38 Cedar street.

Car Workers.

Portland. International Association of Car Workers, Pine Cone Lodge, No. 161; secretary, A. W. Sherwood, 8 New Douglass street; number of members, 5.

Waterville. International Association of Car Workers, Pine Tree Lodge, No. 144; secretary, Fred Fitzgerald, 109 College avenue; number of members, 110.

Railway Workers.

Millinocket. Railway Workers.

Electric Railway Union.

Portland. Local Union of Brothers of Portland.

Retail Clerks.

Augusta. Retail Clerks' Protective Association, No. 819; secretary, Henry L. Haskell, 8 Maple street; number of members, 106.

Brewer. Retail Clerks' Protective Association; secretary, James E. Dounough, 39 Chamberlain street.

Lewiston. Retail Clerks' Protective Association; secretary, A. E. Gyugell; number of members, 94.

Portland. Retail Clerks' Protective Association, No. 674; secretary, Frederick Pease, 229 High street; number of members, 30.

Rumford (Falls). Retail Clerks' Protective Association, No. 229; secretary, Frank B. Mullens, Box 381; number of members, 40.

SHIPBUILDERS, LONGSHOREMEN AND SAILORS.

Ship Carpenters.

Bath. Ship Carpenters' Union.

Boilermakers and Iron Shipbuilders.

Bath. Boilermakers and Iron Shipbuilders' Union; secretary, Nick Hambrick, 17 Wasley Lane; number of members, 175.

Sailmakers.

Bath. Sailmakers' Protective Union, No. 8,232; secretary, Frank Heald, 11 Cummings street; number of members, 21.

Riggers.

Bath. Riggers' Protective Union, No. 8,235; number of members, 35.

Longshoremen.

Bangor. International Longshoremen, Marine and Transportation Association, No. 515; secretary, G. W. Hodge, 20 Pleasant street; number of members, 138.

Portland. Longshoremen's Benevolent Society; secretary, W. J. Wilkinson; number of members, 650.

Longshoremen Carpenters.

Portland. Longshoremen Carpenters, No. 1; secretary, Joseph Vanier, 145½ Newbury street.

Atlantic Seamen.

Bangor. Bangor Branch, Atlantic Coast Seamen's Union; secretary, David F. Perry, 44 Union street; membership for the whole Atlantic coast, 4,366.

Portland. Portland Branch, Atlantic Coast Seamen's Union; secretary, George Foley, 377 Fore street.

STATIONARY ENGINEERS AND FIREMEN.

Stationary Engineers.

Rumford (Falls). Stationary Engineers' Union; secretary, E. A. Powers, 13 Penobscot street; number of members, 15.

Local Firemen.

Brewer (South). International Brotherhood of Stationary Firemen, No. 227.

East Livermore (Livermore Falls). International Brotherhood of Stationary Firemen, No. 70; secretary, Ed. S. Day; number of members, 25.

Gardiner. International Brotherhood of Stationary Firemen, No. 186; secretary, D. A. Wing.

Madison. International Brotherhood of Stationary Firemen, No. 12; secretary, George T. Messerve; number of members, 47.

Millinocket. International Brotherhood of Stationary Firemen, No. 69; secretary, Fred H. Dyer, Box 329; number of members, 60.

Rumford (Falls). International Brotherhood of Stationary Firemen, No. 38; secretary, H. B. Coombs, 700 Prospect avenue; number of members, 75.

Waterville. International Brotherhood of Stationary Firemen, No. 2,010; secretary, Ray Phillips.

TEAM DRIVERS.

Augusta. International Brotherhood of Teamsters, No. 559; secretary, E. R. Merrill; number of members, 37.

Bangor. International Brotherhood of Teamsters, No. 365; secretary, William Chadwick, 16 Garland street; number of members, 57.

Gardiner. International Brotherhood of Teamsters, No. 806.

Portland. International Brotherhood of Teamsters, No. 282; secretary, J. D. Thompson, 34 Stone street; number of members, 100.

Rumford (Falls). International Brotherhood of Teamsters; number of members, 20.

WOOD WORKERS.

Sawmill Employes.

Brewer (South). Sawmill Employes' Union, No. 10,039; secretary, S. J. Hardy, East Hampden; number of members, 150.

Orono. Sawmill Employes' Union.

Millmen Carpenters.

Portland. Millmen's Union, United Brotherhood of Carpenters and Joiners of America, No. 1,474; secretary, Fred E. Libby, 53 Forest avenue; number of members, 50.

Millwrights.

Bangor. Woodworkers' Union, No. 46.

Rumford (Falls). Millwright and Woodworkers' Union; number of members, 12.

MISCELLANEOUS.

Madison. Mechanics' Protective Association; secretary, Dennis McCollar.

Portland. Bakery and Confectionery Workers' International Union of America, No. 260; secretary, William B. Small, 105 Forest avenue; number of members, 60.

Portland. Musicians' Union; secretary, F. M. Stinson, 192 Oxford street.

Portland. Newsboys' Protective Union, No. 11,671; secretary, Abraham Cohen, 4 Chatham street; number of members, 100.

Portland. Silver and Brittania Workers; secretary, Frank J. Barr, 11 Chatham street.

Portland. United Brotherhood Leather Workers on Horse Goods, No. 136; secretary, Charles D. Wood, 787 Forest avenue; number of members, 18.

SYNOPSIS.

The above unions foot up 257, which is 83 more then reported last year.

The barbers report 5 unions; boot and shoe workers, 9; building trades, 50, consisting of carpenters, 14; masons, 12; masons' tenders, 6; lathers and roofers, 1 each; plumbers, 6; and painters, 10.

Cigar makers report 5 unions; cotton mill workers, 10, consisting of carders and slasher tenders, 1 each; mule spinners, 4; weavers and loomfixers, 2 each.

Suspenderworkers, shirtwaist and laundry workers, jounrneymen tailors, and garment workers report 1 union each; electrical workers, 3; granite workers, 47; consisting of quarrymen, 16; granite cutters, 22; and paving cutters, 9. Lime workers report 2 unions.

Iron workers report 17 unions, consisting of blacksmiths, stovemounters, and boilermakers, 1 each; sheet metal workers and foundry workers, 2 each; iron moulders and machinists, 5 each. There are 4 laborers' protective unions, and 9 federal labor unions. Printers report 5 unions, and pressmen and binders, 1 each.

Pulp and paper workers report 23 unions, consisting of pulp, sulphite and paper mill workers, 9; paper makers, 12; and paper bag mill workers and paper box machine operators, 1 each.

Of railway unions there are 24 reported, consisting of railway conductors, 2; locomotive engineers, 5; locomotive firemen, 4; railroad trainmen, 5; railroad telegraphers and car workers, 2 each; car inspectors and repairers, railroad freight handlers, railroad workers, and electric railway workers, 1 each.

Retail clerks report 5 unions; ship builders, longshoremen and sailors, 9, consisting of ship carpenters, boiler makers and iron

ship builders, sail makers, riggers, and longshoremen carpenters, 1 each; longshoremen and Atlantic seamen, 2 each.

Stationary engineers report 1 union; local firemen, 7; team drivers, 5; millmen carpenters, 1; sawmill employes and millwrights, 2 each; and 1 each of mechanics, newsboys, musicians, silver and brittania workers, bakery and confectionery workers, and leather workers on horse goods.

STATE AND CENTRAL LABOR UNIONS.

Maine State Federation of Labor; secretary, John F. Connelly, Box 784, Bangor.

Maine State Conference of the Bricklayers and Masons' International Union; secretary, M. F. Pettingill, 10 Lowell street, Lewiston.

State District Union of the International Brotherhood of Stationary Firemen, No. 3; secretary, George F. Dorr, Box 35, Madison.

Building Trades' Council; secretary, Eugene Braun, Bar Harbor.

Building Trades' Council; secretary, A. P. Richardson, Box 1,223, Bangor.

Maine State District, Mule Spinners' Union, No. 5; secretary, John Hapgood, Box 338, Berwick.

Central Labor Union; secretary, Charles L. Fox, 10 Free street, Portland.

Central Labor Union; secretary, Alden M. Flagg, 94 Spring street, Auburn.

Central Labor Union of Bangor and vicinity; secretary, John F. Connelly, Box 784, Bangor.

Central Labor Union of Augusta, Hallowell and Gardiner; secretary, Abner W. Nichols, Augusta.

Central Labor Union; secretary, E. J. Graham, Box 221, Millinocket.

Central Labor Union; secretary, Chris Birt, Rumford Falls.

Central Labor Union; secretary, William Donnell, 33 Court street, Bath.

NATIONAL CONVENTION OF ASSOCIATION OF OFFICIALS OF BUREAUS OF LABOR STATISTICS.

At the twentieth annual convention of the Association of Officials of Bureaus of Labor Statistics of America, held at Concord, New Hampshire, July 12-16, 1904, William J. Tucker, D. D., president of Dartmouth college, delivered a notable address on the "Consanguinity of Labor and Education." So well pleased were the members of the association at the ideas therein expressed, that it was unanimously voted that the address should not only be spread upon the secretary's records, but that each commissioner should publish it in full in his next annual report.

PRESIDENT TUCKER'S ADDRESS.

Consanguinity of Labor and Education.

What I have to say is in the nature of some reflections upon the *mind* of the wage-earner—an expression which I borrow from the opening sentence of the recent book by John Mitchell on organized labor: "The average wage-earner has made up his mind that he must remain a wage-earner."* I would not take this generalization in any unqualified way. The author has himself qualified it by the use of the word "average." But when reduced to its lowest terms, it is, I think, the most serious statement which has been made of late concerning the social life of the country, for it purports to be the statement of a mental fact. If Mr. Mitchell had said that in his opinion the conditions affecting

* The paragraph from which this quotation is made is as follows: "The average wage-earner has made up his mind that he must remain a wage-earner. He has given up the hope of a kingdom to come, where he himself will be a capitalist, and he asks that the reward for his work be given to him as a working man. Singly he has been too weak to enforce his just demands, and he has sought strength in union, and has associated himself into organizations."

the wage-earner were becoming fixed conditions, that would have been a statement of grave import, but quite different from the one made. Here is an interpretation of the mind of the wage-earner, from one well qualified to give an interpretation of it, to the effect that the average wage-earner has reached a state of mind in which he accepts the fixity of his condition. Having reached this state of mind, the best thing which can be done is to organize the wage-earner into a system through which he may gain the greatest advantage possible within his accepted limitations. I am not disposed to take issue with the conclusion of the argument (I am a firm believer in trade-unions), but I do not like the major premise of the argument. I should be sorry to believe that it was altogether true. And in so far as it is true—in so far, that is, as we are confronted by this mental fact—I believe that we should address ourselves to it quite as definitely as to the physical facts which enter into the labor problem.

If "the average wage-earner has made up his mind that he must remain a wage-earner," we have a new type of solidarity, new at least to this country. No other man amongst us has made up his mind to accept his condition. The majority of men are accepting the conditions of their daily work, but it is not an enforced acceptance. This is true of the great body of people engaged in farming, in mercantile pursuits, and in most of the underpaid professional employments.

In the social order, one of two things must be present to create a solidarity—pride or a grievance. An aristocracy of birth is welded together by pride. It perpetuates itself through the increasing pride of each new generation. An aristocracy is an inheritance, not of wealth, for some "families" are very poor, but of an assured state of mind. An aristocrat does not have to make up his mind; it has been made up for him. An aristocracy is in this respect entirely different from a plutocracy. A plutocracy is at any given time merely an aggregation of wealth. People are struggling to get into it and are continually falling out of it. There is no mental repose in a plutocracy. It is a restless, struggling, disintegrating mass. It has no inherent solidarity.

Next to pride, the chief source of solidarity is a grievance. The solidarity may be transient or permanent. It lasts as long as the sense of grievance lasts. Sometimes the sense of griev-

ance is worn out; then you have to invent some other term than solidarity to express the deplorable condition into which a mass of people may fall. But whenever the sense of dissatisfaction is wide-spread and permanent it deepens into a grievance which creates solidarity. The human element involved is at work to intensify and to perpetuate itself.

Now, when it is said that "the average wage-earner has made up his mind that he must remain a wage-earner," the saying assumes unwillingness on his part, the sense of necessity, and therefore a grievance which, as it is communicated from man to man, creates a solidarity. If you can eliminate the grievance, you break up the solidarity. The wage-earner then becomes, like the farmer, the trader, the schoolmaster, a man of a given occupation. The fact of the great number of wage-earners signifies nothing in a social sense, unless they are bound together by a grievance, unless they have made up their mind to some conclusion which separates them from the community at large or the body politic.

We have come, it seems to me, to the most advanced question concerning "labor," as we find ourselves in the presence of this mental fact which Mr. Mitchell asserts. What can be done to so affect "the mind of the wage-earner" that it will not work toward that kind of solidarity which will be of injury to him and to society?

It is, of course, entirely obvious that a greater freedom of mind on the part of the wage-earner may be expected to follow the betterment of his condition. This betterment of condition is the one and final object of the trade-union. I doubt if one-half of that which the trade-union has gained for the wage-earner could have been gained in any other way. I doubt if one-quarter of the gain would have been reached in any other way. Trade-unionism is the business method of affecting the betterment of the wage-earner under the highly organized conditions of the modern industrial world. But trade-unionism at its best must do its work within two clear limitations.

In the first place, every advance that trade-unionism tries to make in behalf of the wage-earner as such finds a natural limit. The principle of exclusiveness, of separate advantage, is a limited principle. At a given point, now here, now there, it is sure to react upon itself, or to be turned back. Organization

meets opposing organization. Public interests become involved. Moral issues are raised. The co-operating sympathy of men, which can always be counted upon in any fair appeal to it, turns at once into rebuke and restraint if it is abused. The wage-earner in a democracy will never be allowed to get far beyond the average man through any exclusive advantages which he may attempt through organization.

In the second place, trade-unionism can deal with the wage-earner only as a wage-earner, and he is more than a wage-earner. There comes a time when he cannot be satisfied with wages. The betterment of his condition creates wants beyond those which it satisfies. The growing mind of the wage-earner, like anybody's growing mind, seeks to widen its environment. It wants contact with other kinds of minds. When once it becomes aware of its provincialism it tries to escape from it—a fact which is clearly attested in the broadening social and political relations of the stronger labor leaders.

But while I believe that trade-unionism is the business method of enlarging the mind of the wage-earner through the betterment of his condition, I think that the time has come for the use or adaptation of other means which may give it freedom and expansion. One means of preventing a narrow and exclusive soliditary of wage-earners is greater identification on their part with the community through the acquisition of local property. Mobility is, in the earlier stages of the development of the wage-earner, the source of his strength. He can easily change to his interest. No advantage can be taken of his fixity. He can put himself without loss into the open market. He can avail himself at once of the highest market price, provided his change of place does not affect injuriously his fellow workers in the union —an exception of growing concern.

But in the more advanced stages of labor the wage-earner gains the privilege of localizing himself, and in so doing he takes a long step in the direction of full and free citizenship. A good deposit in a savings-bank adds to his social value, but that value is greatly enhanced by exchanging it for a good house.

I am aware that in advancing the acquisition of local property I touch upon the large and as yet undetermined question of the decentralization of labor. If the great cities are to be the home of the industries, then this idea can be realized in only a partial

degree through suburban homes. But if the industries are to seek out or establish smaller centers, then the wage-earner has the opportunity to become more distinctly and more conspicuously a citizen.

Another means of giving freedom and expansion to the wage-earning population in place of a narrow and exclusive solidarity is by giving to it ready access to the higher education. There is no reason why the former experience of the New England farmer and the present experience of the Western farmer should not be repeated in the family of the intelligent wage-earner. The sons of the New England farmer who were sent to college identified their families with the state and church and with all public interests. They lifted the family horizon. I have said that this experience may be repeated in the families of the wage-earner. It is being repeated. Let me give you an illustration with which I am familiar. The students at Dartmouth are divided about as follows, according to the occupation of their fathers: Forty per cent are the sons of business men, twenty-five per cent of professional men, fifteen per cent of farmers; of the remaining thirty per cent, more than half are the sons of wage-earners. The per cent from the shops now equals that from the farm. I have no doubt that this proportion will hold in most of our Eastern colleges and universities. The home of the wage-earner is becoming a recruiting ground for higher education which no college can afford to overlook. As Professor Marshall, the English economist, has said, "Since the manual-labor classes are four or five times as numerous as all other classes put together, it is not unlikely that more than half of the best natural genius that is born into the country belongs to them." And from this statement he goes on to draw the conclusion that "there is no extravagance more prejudicial to the growth of the national wealth than that wasteful negligence which allows genius which happens to be born of lowly parentage to expend itself in lowly work." So much for the necessity of fresh, virile and self-supporting stock to the higher education, if it is to discharge its obligation to society. Virility is as necessary to educational progress as it is to industrial progress. I am in the habit of saying that, from an educational point of view, it is on the whole easier to make blue blood out of red blood than it is to make red blood out of blue blood. The reaction from the higher

education upon the family of the wage-earner is yet to be seen, but no one can doubt its broadening influence. As the representatives of these families become more numerous in our colleges and universities, and as they have time to make a place for themselves in all the great callings, they will of necessity lift those whom they represent toward their own level. Some of them will become captains of industry. I believe that in that capacity they will also become leaders of labor. For, as it seems to me, the settlement of the relation of capital and labor is to be more and more, not in the hands of men who have been trained away from one another, but in the hands of men who have been trained toward one another. The industrial world is becoming a great school in which men must learn to practice the industrial virtues. And among these virtues I put, next to honesty in work and in the wage of work, and absolute fidelity in keeping agreements at any cost, that sense of justice which comes of the ability to put one's self in another's place. When we have capitalists and leaders of labor, it must be both at one and the same time, who are really able "to reason together," we shall have industrial peace. This will mean arbitration at first hand.

I mention another source of freedom and breadth and power to the wage-earner—a source which is common to all—namely, satisfaction in his work. The wage is not and never can be the sufficient reward of labor. This is just as true of the salary as of the wage. The difference at present lies in the fact that the person on a low salary is apt to take more satisfaction in his work than the person on a high wage—the school teacher on $800 or $1,000 a year, in distinction from the mechanic on four or six dollars a day. The present ambition of the high wage-earner seems to incline more to the pecuniary rewards of his work than to the work itself. Doubtless this tendency is due in no slight degree to the fact that the wage-earner is brought into constant and immediate contact with the money-making class. He sees that the value of the industry is measured chiefly by its profits. Sometimes the profits are flaunted in his face. At all times the thing most in evidence to him is money. I deprecate this constant comparison between the capitalist and the laborer. The comparison were far better taken between the workman and the other men whose chief reward is not money. The old-time professions still live and maintain their position through a

certain detachment from pecuniary rewards. The exceptional doctor may receive large fees, but his profession forbids him to make a dollar out of any discovery which he may make in medicine. The exceptional minister may receive a large salary, but his profession puts the premium upon self-denying work. Even the law is more distinctively represented by the moderate salary of the average judge than by the retainer of the counsel for a wealthy corporation. The skilled workman, the artisan, belongs with these men, not with the money-makers. In allowing himself to be commercialized he enters upon a cheap and unsatisfying competition. His work is an art, and he has the possible reward of the artist. Under medievalism the guild and the university were not far apart. I should like to see the relation restored and extended.

I am not speaking in this connection of the unskilled laborer. There is a point below which it is impossible to idealize labor. The man who works in ceaseless and petty monotony, and under physical discomfort and danger, cannot do anything more than to earn an honest livelihood, if, indeed, he receives the living wage. But he is as far removed from the advanced wage-earner of our day as he is from any of the well-supported and well-rewarded classes. For him we are all bound to work, and to act, and to think—not as an object of our charity, but as a part of our industrial brotherhood; and whenever a great labor leader, be he John Burns or John Mitchell, goes to his relief and tries to give him self-supporting and self-respecting standing, we should count it not a duty but an honor to follow the leading; but equally do I hold it to be a duty and an honor that, as the wage-earner advances in intelligence, in pecuniary reward, and in position, he should take his place without any reservation whatever among those who are trying to meet the responsibilities which attach to citizenship in a democracy.

I have not attempted, gentlemen, to enter at all in this brief discussion into the technical aspects of your work, but I am aware that I have covered ground entirely familiar to you. Very likely your broader judgment and clearer insight into details may modify some of my positions or make them untenable. But viewing the present disposition and purpose of the best-intentioned leaders in the ranks of organized labor, with many of whom you have to do, I am convinced that their avowed

object is not commensurate with their opportunity. I am convinced that the interpretation put upon the mind of the wage-earner, if it represents a present fact, ought to suggest a duty toward the mind of labor. That duty is to give it freedom, breadth, expansion; to incorporate it into the common mind of aspiration and hope, the American type of mind. In saying this I do not overlook or minimize the imperative duty of raising the lowest wage-earner to the highest place to which he can be lifted, and of giving a future to his children and to his children's children. I would urge, in the full apostolic sense, the old apostolic injunction—"We that are strong ought to bear the infirmities of the weak." But I would not stop with this duty. I would make the wage-earner, as he grows strong, a helper all round; a partner in all the serious work of the republic; an active power in that commonwealth which draws no line within the wants or hopes of man.

MR. BEALIN (superintendent free employment office, New York city): I would like to ask President Tucker a question. In speaking of the advantages of higher education when obtained by the children of wage-workers, the paper read would leave the impression that this advantage would create a kind of messenger of peace between the two classes of society—between the employing class and the employed. While I am in favor of education, I rather think there is danger that, instead of the boy who goes from the home of the wage-worker to college remaining in contact and in sympathy with his family in all things, in spirit and in body, the chances are that he would be ashamed of his low origin, and that in after-life he would not be found associating with the people of his birth and of his early environment; that he would be in the opposite class, doing injury instead of service in a great many instances. I think that perhaps it would result in his getting in on the outer edge of what is called our better class, and that this would create a cleavage between the son and his father and between the child and the home.

PRESIDENT TUCKER: I will give a single illustration of what lies within my observation. I have said that at Dartmouth perhaps fifteen per cent of our students are sons of wage-earners.

In connection with our graduating exercises is a social reception, at which the students very generally bring their friends, and I do not know of anything that has touched me more than the invariable custom of these men in bringing their fathers and mothers and introducing them with a loyalty and a pride into the class of people variously represented without the slightest embarrassment and with the utmost naturalness. So far as my observation goes, I do not see the danger to which reference has been made. I understand entirely what the possibilities are in that direction; but if the training of our colleges is to take the snobbery out of men and quicken their sympathy, I think that this result ought to hold with regard to the son of the wage-earner as well as with regard to the son of anybody. It is all in the atmosphere, I think—in the manner in which colleges go about their work and the way in which they create or fail to create a social democracy.

REVISED LABOR LAWS OF MAINE.

The laws covering the powers and duties of the commissioner of industrial and labor statistics, and those of the inspector of factories, workshops, mines and quarries, have recently been codified and published as a portion of chapter forty of the revised statutes, being sections forty to sixty-two inclusive, which are as follows:

BUREAU OF INDUSTRIAL AND LABOR STATISTICS.

Sec. 40. The Bureau of Industrial and Labor Statistics shall constitute a separate and distinct department. The governor shall, with the advice and consent of the council, biennially, on the first Wednesday in February, appoint some suitable person identified with the industrial and labor interests of the state, who shall be designated commissioner of industrial and labor statistics, with an office in such place as shall be designated by the governor.

Sec. 41. The said commissioner shall collect, assort, systematize and present in annual reports to the governor, to be by him transmitted biennially to the legislature, statistical details, relating to all departments of labor in the state, and especially to the commercial, industrial, social, educational and sanitary condition of the laboring people, and to the permanent prosperity of the productive industries of the state; and shall also inquire into the immediate causes of strikes, lock-outs and other disturbances between employers and employees.

Sec. 42. He may take and preserve evidence, examine witnesses under oath, and administer the same, and in the discharge of his duty, may enter any public institution of the state, and at reasonable hours, when open for business, any factory, workshop, mine or other place where labor may be employed. All state, county, city and town officers, are hereby directed to fur-

nish to said commissioner upon his request, all statistical information in reference to labor and labor industries, which shall be in their possession as such officers.

Sec. 43. The governor, with the advice and consent of the council, shall appoint an inspector of factories, workshops, mines and quarries who shall hold office for two years, or until his successor is appointed, unless sooner removed. Said inspector shall inquire into any violations of sections forty-eight to fifty-six inclusive, of this chapter, and assist in the collection of statistics and other information which may be required, for the use of the bureau of industrial and labor statistics. Whenever the governor shall be satisfied that said inspector cannot perform all the duties of his office required by this section, in person, he shall, with the advice and consent of the council, appoint a sufficient number of assistant inspectors to assist him in so doing, who shall hold office for the term of two years, and act under the direction of said inspector, and shall receive the sum of two dollars a day and reasonable expenses while actually engaged in duty. They may, at any time, be removed for cause by the governor. For the purpose of inquiring into any violation of the provisions of said sections forty-eight to fifty-six of this chapter, relating to the regulation of the hours of labor and the employment of women and children in manufacturing and mechanical establishments, and enforcing the penalties thereof, such inspector and assistants may, at all reasonable times, enter any such establishments and make investigation concerning such violations. Such investigation shall be conducted with as little interruption as possible to the prosecution of the business of such establishment. Whoever interferes with said inspector or his assistants, in the performance of their duties as prescribed in this chapter, shall be fined fifty dollars.

Sec. 44. The said inspector, upon complaint, shall inquire into, and prosecute for, any violations of sections fifty-seven and fifty-eight of this chapter, relating to the fortnightly payment of wages. He shall also examine into the sanitary condition of factories, workshops, mines and quarries, and when any condition or thing is found that, in his opinion endangers the health or lives of the employees, he shall notify the local board of health, and said board of health shall investigate the matter.

Sec. 45. He shall enforce the due observance of sections thirty-seven and thirty-eight of chapter twenty-eight, relating to the swinging of doors, and fire escapes in factories and workshops.

Sec. 46. He shall, on or before the first day of December annually, submit his report to the commissioner of industrial and labor statistics, and it shall be incorporated in, and printed with the annual report of the bureau of industrial and labor statistics.

Sec. 47. The expenses of the department, including all bills for the expenses of the inspector of factories, workshops, mines and quarries, and for the services and expenses of assistant inspectors, shall be paid on vouchers presented by the commissioner, after the same shall have been audited and approved by the governor and council.

HOURS OF LABOR OF WOMEN AND CHILDREN.

Sec. 48. No female minor under eighteen years of age, no male minor under sixteen years of age, and no woman shall be employed in laboring in any manufacturing or mechanical establishment in the state, more than ten hours in any one day, except when it is necessary to make repairs to prevent the interruption of the ordinary running of the machinery, or when a different apportionment of the hours of labor is made for the sole purpose of making a shorter day's work for one day of the week; and in no case shall the hours of labor exceed sixty in a week; and no male person sixten years and over shall be so employed as above, more than ten hours a day during minority, unless he voluntarily contracts to do so with the consent of his parents, or one of them, if any, or guardian, and in such case he shall receive extra compensation for his services; *provided, however,* that any female of eighteen years of age or over, may lawfully contract for such labor for any number of hours in excess of ten hours a day, not exceeding six hours in any one week or sixty hours in any one year, receiving additional compensation therefor; but during her minority, the consent of her parents, or one of them, or guardian, shall be first obtained.

Sec. 49. Every employer shall post in a conspicuous place in every room where such persons are employed, a notice printed in plain, large type, stating the number of hours' work required

of them on each day of the week, the exact time for commencing work in the morning, stopping at noon for dinner, commencing after dinner and stopping at night; the form of such printed notice shall be furnished by the inspector of factories, workshops, mines and quarries, and shall be approved by the attorney general. And the employment of any such person for a longer time in any day than that so stated, shall be deemed a violation of the preceding section, unless it appears that such employment is to make up for time lost on some previous day of the same week, in consequence of the stopping of machinery upon which such person was employed or dependent for employment.

Sec. 50. Whoever, either for himself, or as superintendent, overseer or agent of another, employs or has in his employment any person in violation of the provisions of section forty-eight, and every parent or guardian who permits any minor to be so employed, shall be punished by a fine of not less than twenty-five, nor more than fifty dollars for each offense. A certificate of the age of a minor made by him and by his parent or guardian at the time of his employment, shall be conclusive evidence of his age in behalf of the hirer, upon any prosecution for a violation of the provisions of section forty-eight. Whoever falsely makes and utters such a certificate with an intention to evade the provisions of this chapter relating to the employment of minors, shall be subject to a fine of one hundred dollars.

Sec. 51. Any person, firm or corporation engaged in any manufacturing or mechanical business, may contract with adult or minor employees to give one week's notice of intention on such employee's part, to quit such employment under a penalty of forfeiture of one week's wages. In such case, the employer shall be required to give a like notice of intention to discharge the employee; and on failure, shall pay to such employee, a sum equal to one week's wages. No such forfeiture shall be enforced when the leaving or discharge of the employee is for a reasonable cause. *Provided, however,* that the enforcement of the penalty aforesaid, shall not prevent either party from recovering damages for a breach of the contract of hire.

Sec. 52. No child under twelve years of age, shall be employed in any manufacturing or mechanical establishment in the state. Whoever, either for himself, or as superintendent, overseer or agent of another, employs or has in his employment

any child in violation of the provisions of this section, and every parent or guardian who permits any child to be so employed, shall be punished by a fine of not less than twenty-five, nor more than fifty dollars for each offense.

Sec. 53. No child under fifteen years of age shall be employed in any manufacturing or mechanical establishment in the state, except during vacations of the public schools in the city or town in which he resides, unless absence from such school is excused by the superintending school committee or superintendent of schools, or teacher acting by direction of either, as provided by section forty-nine of chapter fifteen.

Sec. 54. Any parent or guardian who procures a child to be employed contrary to the preceding section, and any corporation, owner, superintendent or agent of the owner, of such establishment violating the provisions of said section, shall forfeit the sum of one hundred dollars, one-half to the use of the county, and one-half to the use of the city or town where the offense is committed. Money so recovered to the use of the city or town, shall be added to its school money. School committees and superintendents of public schools, shall inquire into violations of said section and report the same to the county attorney, who shall prosecute therefor.

Sec. 55. Every owner, superintendent or overseer of any such manufacturing or mechanical establishment shall require and keep on file, a certificate of the age and place of birth of every child under sixteen years of age employed therein, so long as such child is so employed. Said certificate shall be signed by a member of the school committee of the place where such attendance has been had, or by some one authorized by such committee, and the form of said certificate shall be furnished by the state superintendent of public schools, and shall be approved by the attorney general. The inspector of factories, workshops, mines and quarries, or either of his assistants, may demand the names of the children under sixteen years of age employed in such establishment, in the several cities and towns of the state, and may require that the certificates of age prescribed in this section, shall be produced for his inspection, and a failure to produce the same, shall be prima facie evidence that the employment of such child is illegal.

Sec. 56. Nothing in the eight preceding sections shall apply to any manufacturing establishment or business, the materials and products of which are perishable and require immediate labor thereon, to prevent decay thereof or damage thereto.

FORTNIGHTLY PAYMENT OF WAGES.

Sec. 57. Every manufacturing, mining, quarrying, stone-cutting, mercantile, street railroad, telegraph, telephone and municipal corporation, and every incorporated express and water company, and any person or firm engaged in any of the above specified kinds of business, having in their employ more than ten persons, shall pay fortnightly each and every employee engaged in its business, except municipal officers whose services are paid for by the day, or teachers employed by municipal corporations, the wages earned by such employee to within eight days of the date of said payment,*provided, however,* that if at any time of payment, any employee shall be absent from his regular place of labor, he shall be entitled to said payment at any time thereafter on demand.

Sec. 58. Any corporation violating any provision of the preceding section shall be punished by a fine of not less than ten, nor more than twenty-five dollars on each complaint under which it is convicted,*provided*, that complaint for such violation is made within thirty days from the date thereof. When a corporation against which a complaint is so made, fails to appear after being duly served with process, its default shall be recorded, the allegations in the complaint taken to be true, and judgment rendered accordingly. When judgment is rendered upon any such complaint against a corporation, the court may issue a warrant of distress to compel the payment of the penalty prescribed by law, together with costs and interest.

MAINE MINING BUREAU.

Sec 59. The land agent, the commissioner of agriculture and the commissioner of industrial and labor statistics are constituted a mining board to be known as the Maine Mining Bureau. They shall organize by electing from their number a president and a secretary.

Sec. 60. Said bureau shall collect reliable information concerning the deposits of all precious and useful minerals and

other valuable subterranean productions in the state that are supposed to exist in quantities sufficient to justy the development of such properties.

Sec. 61. It shall establish a metallurgical cabinet of exhibit of the state in such room in the state house, as the superintendent of public buildings may direct, and in such cabinet they shall properly arrange samples and specimens of ores, valuable rocks and metals of the state collected by them, for the safe keeping and preservation of same.

Sec. 62. It shall biennially issue a pamphlet containing such reliable information concerning the mineral resources of the state as it has collected, and shall distribute at least one thousand copies of such pamphlet among the business men and capitalists of other states.

REPORT

OF THE

Inspector of Factories, Workshops, Mines and Quarries.

STATE OF MAINE.

OFFICE OF INSPECTOR OF FACTORIES,
WORKSHOPS, MINES AND QUARRIES,
BIDDEFORD, DECEMBER 1, 1904.

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 eighth annual report.

Very respectfully,

CHARLES E. ATWOOD,

Inspector.

REPORT.

ANNUAL CONVENTION.

The eighteenth annual convention of the International Association of Factory Inspectors has recently been held in St. Louis. This association, in its intelligent efforts to systematize and uplift the labor industries of this nation, may fairly be taken as a true indicator of the rise, progress and sterling benefits arising from factory inspection in the United States. At the beginning, eighteen years ago, there were but five states in which the factory inspector was a known quantity; today factory inspection is established by law in twenty-five states and two Canadian provinces. As showing how the factory inspector is regarded in that great city of the West, a feature of the annual gathering of this international association was its welcome to St. Louis by the Business Men's Association of that city, composed of over four hundred manufacturers.

SAFEGUARDS FOR MACHINERY.

The importance of safeguards for machinery is not recognized in Maine as I believe it should be, indeed it is not recognized at all by any law. Yet I am able to report that much has been done by manufacturers to protect those who handle dangerous machines in mills and workshops. But this is not enough. A state law requiring reports of all accidents from unguarded machines to be made to the factory inspector would bring the matter into due prominence at once, not only to the public but to mill owners and manufacturers as well.

Thus far the only safeguards required by law in this State are those against fire by the outward swinging of doors, and by fire escapes. Machines great and small, highly dangerous as many of them are, housed and swiftly whirling in immense structures standing on the banks of the rivers of Maine and in its great

manufacturing centers, have never yet impressed the average Maine legislator as being of sufficient importance to call for safety legislation. One point which I desire to impress upon the attention of the Maine legislator is, that while in an indirect way the danger side of factory buildings has been touched upon by our factory laws, dangerous machines and dangerous trades have been utterly neglected. While we are clamorous in our denial of child labor of any kind below a certain age, we interpose no barrier to the admission of such children to any of the dangerous callings, where they are absolutely without protection from lurking poison fumes and dangerous machines which may wreck their bodily health or send them maimed to the poorhouse or to premature graves, if only they can produce a certificate that they have passed a certain age limit. The record of accidents for the past year shows that three-fourths of the fingers and hands lost in mill machinery, together with arm and leg disfigurement, have fallen upon women and children, due partly to their inexperience, but largely to the unguarded machine. In the state of Indiana alone forty-two boys lost fingers or hands.

I respectfully submit the form of an act to provide for the guarding of machinery similar to that adopted into law by Ohio and some other states:

Be it enacted by the Senate and House of Representatives in Legislature assembled, as follows:

Sec. 1. That owners and operators of factories and workshops, which terms shall mean all manufacturing, mechanical, electrical and mercantile establishments, and all places where machinery of any kind is used or operated, shall take ordinary care and make such suitable provisions as to prevent injury to persons who may come in contact with any such machinery, or any part thereof; and such ordinary care and such suitable provisions shall include the casing or boxing of all shafting when operating horizontally near floors, or when in perpendicular or other position operating between, from or through floors, or traversing near floors, or when operating near passageways, or directly over the heads of employes; the enclosure of all exposed cogwheels, flywheels, bandwheels, all main belts transmitting power from engine to dynamo, or other kind of machinery; and all openings through floors, through or in which such wheels or belts may operate, with substantial railings; the covering, cutting

off or counter-sinking of keys, bolts, set-screws, and all parts of wheels, shafting or other revolving machinery projecting unevenly from and beyond the surface of such revolving parts of such machinery; the railing in all unused elevator openings, the placing of automatic gates or floor doors, and the keeping of same in good condition, on each floor from which and where on each side or sides of elevator openings entrance to the elevator carriage is obtained; the frequent examination and keeping in sound condition of ropes, gearing and other parts of elevators; the closing of stair openings on all floors, except where access to stairs is obtained, and the railing of stairs between floors; the lighting of hallways, rooms, approaches to rooms, basements and other places wherein sufficient daylight is not obtainable; the guarding of all saws and other wood-cutting and wood-shaping machinery; providing shifters for shifting belts, and poles and other appliances for removing and replacing belts of single pulleys and adjusting runways, and staging used for oiling and other purposes more than five feet from floors with hand-railing; and providing counter-shafting with tight and loose pulleys or such other suitable appliances in each room, separate from the engine room, for disconnecting machinery from other machinery when in operation.

Sec. 2. Any owner or operator of a factory or workshop as defined in section one of this act who violates any of the provisions of said section shall be fined for the first offense not exceeding one hundred dollars, and for every subsequent offense not less than fifty dollars nor more than five hundred dollars.

Sec. 3. The inspector of factories, workshops, mines and quarries, whenever he shall obtain knowledge of violation of provisions of section one of this act is hereby authorized, whenever he may deem it advisable, to paste upon any machine, device, elevator, utensil, structure or machinery or part of machinery of any kind a notice stating that such machine, device, elevator, structure or machinery or part of machinery of any kind is dangerous to use or operate, and that operatives or employes are liable to injury by its use or operation; and such notice shall designate and describe the alteration or other change necessary to be made in order to insure safety of operation, the date of inspection and the time allowed for such alteration or change to be made; and no such machine, device, elevator, utensil, struc-

ture or machinery of any kind shall be used or operated after such notice is posted thereon until such change or alteration is made to the satisfaction of the inspector having made such recommendation.

Sec. 4. Any such owner or operator of a factory or workshop who violates any of the provisions of section three of this act shall be fined for the first offense not less than twenty-five nor more than one hundred dollars, and for every subsequent offense not less than fifty nor more than five hundred dollars.

Sec. 5. It shall be the duty of the inspector of factories, workshops, mines and quarries to prosecute all violations of the provisions of this act.

Sec. 6. This act shall take effect when approved.

EMPLOYERS' LIABILITY LAW.

The liability of employers for injuries received by their employes is a phase of labor legislation which is receiving attention in many states. In his annual message to Congress, President Roosevelt takes up this question and treats it in language of no uncertain sound. He makes special reference to railroad companies and railroad men. The President says:

"The wage-workers are peculiarly entitled to the protection and the encouragement of the law. From the very nature of their occupation railroad men, for instance, are liable to be maimed in doing the legitimate work of their profession, unless the railroad companies are required by law to make ample provision for their safety. The administration has been zealous in enforcing the existing law for this purpose. That law should be amended and strengthened. Wherever the national government has power there should be a stringent employers' liability law, which should apply to the government itself where the government is an employer of labor."

The President's words as to railroad employes apply with equal force to all employes in factories and workshops where dangerous and unprotected machines are used. Pass a law making employers liable for injuries received from unprotected dangerous machines in this State, and then a law, such as already outlined for the guarding of machinery placed on our statute books would enforce itself with but very little assistance. The courts in other states sustain not only the constitutionality of liability laws, but declare their sufficiency to meet real cases of injury.

A case in point is that of William Klatt, brought in the circuit court of LaCrosse county, Wisconsin, against a lumber company. He was working near several chains running parallel with each other along the surface of the floor, with his feet close to a sprocket wheel which projected above the floor, and there was no protection to prevent his feet from getting into the wheel and chains. His foot slipped on the floor and was caught by the chain and hooks thereon and severely injured, the toes and part of the foot being torn off. Judgment was rendered for the plaintiff. Defendant appealed to the supreme court where the judgment was affirmed.

An employers' liability law appears to me to be one of the urgent needs of our State, and I respectfully urge this matter upon the attention of the joint legislative committee having labor interests in charge, believing that they will see, as I do, its importance. An act framed to meet the requirements of Maine labor interests would, I believe, be favorably received by our State legislators.

THE CHILD LABOR PROBLEM.

The problem of child labor is still with us. Its solution continues to stagger the wisest heads in the industrial world, and its presence is certain to continue as a prime factor therein until taken from view by a righteous settlement. Child labor is co-existent with the industrial economy of the Adamic garden. Labor is a heaven-born necessity, and necessity knows but little law or respect for it. Hence it goes without saying that an element, so vital to human existence itself as labor, cannot be regulated by a wave of the hand in a single day, nor by the dictum of an empire or a nation in a century, when the thing to be regulated must be its own regulator.

Twenty years ago child labor, as a feature of industrial life, first came into prominence in this country; yet today, when compared with the great international labor problem of the time, it is but a side issue, although rapidly gaining in importance. The magnitude of child labor in the United States may be surmised when it is stated that there is 1 child laborer to every 30.6 laboring adults, at some form of work. This covers only the manufacturing and mechanical industries, and excludes mining and non-manufacturing industries. In this State there is but 1 child

to 75 adults employed; in the state of Minnesota there is but 1 child to 96.5 adults employed.

It is in the South that the conditions surrounding child labor are most deplorable; for instance, in South Carolina every fourth person employed is a child of tender years; in North Carolina it is almost as distressing, where the proportion is one to five. In all of the Southern states the same conditions exist, but not to the same degree. And it is right here that the demoralizing effects of child labor as an industrial element are being felt today in the recent great cotton mill strike at Fall River. There, seventy-five great manufacturing establishments and fifty thousand employes were for many weeks face to face with cheap Southern labor. The employes refused to work for wages too small for their subsistence, and the manufacturers refused an advance of wages because their Southern competitors could undersell them in the markets of the world. Both sides were practically up against the same economic conditions, resulting almost directly from child labor in the South.

Lieutenant Governor Curtis Guild of Massachusetts, in a notable speech before the Merchants' Club of Boston recently, while extolling the child labor laws of New England, urges the formation of national child labor laws, or uniform state laws, as a remedy for the deplorable conditions which now interfere so seriously with New England's textile industry. Mr. Guild says:

"There isn't a greater threat to industry, to citizenship, to humanity, than child labor. Efforts against it are only partially effective as long as they are purely local. We forbid a man to employ child labor in Massachusetts alone, but by merely transferring his plant to Alabama or Georgia, he can put into the markets cloth made there by child labor to compete with cloth made here by adult labor.

"The four states that are most prominent in using child labor in cotton mills are Alabama, South and North Carolina and Georgia. In none of these states is there the thorough inspection of factories that exists here, and even such laws as exist are ineffective. Even the nominal laws demand less than ours."

In line with Lieutenant Governor Guild, comes President Roosevelt in his annual message. He calls upon the Department of Commerce and Labor to lay before Congress a list of the labor laws of the states, especially those relating to the conditions of child labor, including an investigation of the problems with which the question of child labor is connected. While not advo-

cating a national child labor law, like Mr. Guild, he claims that uniform legislation by all the states as to child labor is the point to be gained. He says:

"These child labor problems can be actually met in most cases only by the states themselves; but the lack of proper legislation in one state in such a matter as child labor often renders it excessively difficult to establish protective restriction upon the work in another state having the same industries, so that the worst tends to drag down the better. For this reason it would be well for the nation at least to endeavor to secure comprehensive information as to the conditions of labor of children in the different states. Such investigation and publication by the national government would tend toward the securing of approximately uniform legislation of the proper character among the several states."

In this State the child labor feature is relatively small and shows but little if any upward tendency. As previously stated, its percentage of child labor is next to the lowest in the country, and as a factor in the industrial system of the State it is entitled to no such importance as some try to attach to it. And yet it is undoubtedly true that under our labor laws as they now stand, in spite of my best efforts to enforce them, it has been found impossible to draw the age limit line with exactness. The following are the sections of chapter forty of the Revised Statutes, under which I have found the greatest difficulty in enforcing due restrictions:

Sec. 52. No child under twelve years of age, shall be employed in any manufacturing or mechanical establishment in the State. Whoever, either for himself, or as superintendent, overseer or agent of another, employs or has in his employment any child in violation of the provisions of this section, and every parent or guardian who permits any child to be so employed, shall be punished by a fine of not less than twenty-five, nor more than fifty dollars for each offense.

Sec. 53. No child under fifteen years of age shall be employed in any manufacturing or mechanical establishment in the State, except during vacations of the public schools in the city or town in which he resides, unless absence from such school is excused by the superintending school committee or superintendent of schools, or teacher acting by direction of either, as provided by section forty-nine of chapter fifteen.

Sec. 55. Every owner, superintendent or overseer of any such manufacturing or mechanical establishment shall require and

keep on file, a certificate of the age and place of birth of every child under sixteen years of age employed therein, so long as such child is so employed. Said certificate shall be signed by a member of the school committee of the place where such attendance has been had, or by some one authorized by such committee, and the form of said certificate shall be furnished by the state superintendent of public schools, and shall be approved by the attorney general. The inspector of factories, workshops, mines and quarries, or either of his assistants, may demand the names of the children under sixteen years of age employed in such establishment, in the several cities and towns of the State, and may require that the certificates of age prescribed in this section, shall be produced for his inspection, and a failure to produce the same, shall be prima facie evidence that the employment of such child is illegal.

These sections of our State industrial laws which touch child labor have stood upon our statute books substantially as they read today for eighteen years unmoved. While changes for the better and on lines of true progress in the matter of labor legislation have been moving up grade constantly in our neighbor states, Maine has been untrue to her proud motto, "I Lead," and has been standing still with folded arms. The Maine lawmaker, while wide awake to protection of short lobsters, the cultivation of wide-rimmed wheels and the extermination of porcupines, during all the years has been virtually blind to the crying need for better industrial conditions for the working boys and girls of today, who are to become the men and women of tomorrow.

In former annual reports I have set these matters before the people of the State with plainness and emphasis, and have urged the adoption of much needed amendments to the old law, but thus far without avail. The barrier which has confronted me from the first in my efforts to enforce the child labor restrictions to the full limit, has been the practical impossibility to determine the true ages of child operatives. Section 55 of the statute already quoted, provides that "Every owner, superintendent or overseer of any such manufacturing or mechanical establishment shall require and keep on file a certificate of the age and place of birth of every child under sixteen years of age employed therein, so long as such child is so employed."

The inspector enters the factory, and after counting up the child help he asks the overseer for his certificates, which are

promptly shown, with the result that every child in the room has apparently complied with all the legal requirements. What the inspector finds in one room, he finds in every room and in every mill. This has been my experience for years past, almost without a break. No evidence has appeared, as shown by the papers, that a single child was being illegally employed. Right here is seen the need of a more stringent system of certification.

The law, as at present framed, is capable of being more effectually used to protect illegal child labor in the mills, than to prevent it. The vital point upon which the whole problem should turn would be *a sworn official copy of the birth record of every child employed.* With this made conclusive the rest would be easy; without it, as now, the inspection official is well nigh powerless to act. Now, everything depends upon the honesty of parents. When, through anxiety to secure places for their children, they do not hesitate to falsify the records, it becomes the duty of the State to check a practice so misleading and vicious. Give me a law with teeth in it, and the fault will be mine if results do not follow.

To more intelligently present my views I beg to recommend that section 55 of chapter forty of the Revised Statutes be so amended as to require every child under sixteen years of age, employed in any manufacturing or mechanical establishment, to file with the owner, superintendent or overseer thereof, an employment ticket and *a sworn official copy of the city, town or parish records of his birth or baptism;* said certificate to be countersigned by a member of the school committee, showing the amount of such child's school attendance during the year preceding such employment.

Under the present law the adjustment of this important detail lies wholly between the parent and the mill officer, mutually interested parties. If the parent strains a point and says his child is thirteen when he is but eleven, or sixteen when he is but fourteen, without an official record of the child's birth, the State has no remedy. The *birth record* is the true test.

Every parent knows where his child was born, and the cases are few in which a record thereof is not to be found in city, town or parish. Require the parent to produce a sworn copy of that record when he brings his child to the mill, and you at once have a law that will execute itself in a manner to silence cavilers.

Without such a requirement, illegally employed child labor will continue to snap its fingers in the face of the factory inspector and the child labor law.

There is no danger that legislation on this subject will be too radical. The plea that child labor is right because parents need the pay for their work is quite as superficial as is the plea that stealing is right when the thief is in need of his plunder. Better cut off the earnings which the boys and girls contribute to the family support during the years when they should be at school, where they should be accumulating knowledge and physical resources required to make them valuable citizens, than to yield to temporary necessities. It is of more importance to the State that the young generation should grow up strong in body and well equipped in mind, than that our manufacturing industries should get their labor at the lowest figure. It has been the boast of New England that its chief product was men, and Maine has stood behind this boast with many grand examples. If this boast is not to be dishonored there must be no license which permits the exhaustion of the powers of the children who are to form our body of citizenship in a few years.

CHILDREN EMPLOYED.

The average number of children employed in the cotton and woolen mills of this State for the years 1902, 1903 and 1904, as given in the following schedule, is interesting as showing, not only the fluctuations from year to year, but the actual dimensions of the Maine contingent of child operatives, in the face of laws which the candid inquirer will readily admit are lacking in efficiency to deal with the child labor problem with best results:

Name of Corporation.	Location.	Children Employed.								
		1902.			1903.			1904.		
		Under 16 years.	Between 15 and 16 years.	Under 15 years.	Under 16 years.	Between 15 and 16 years.	Under 15 years.	Under 16 years.	Between 15 and 16 years.	Under 15 years.
Androscoggin Mills	Lewiston	24	17	7	27	22	5	45	28	17
Bates Manf. Co	Lewiston	21	12	9	24	20	4	29	21	8
Continental Mills	Lewiston	17	12	5	17	13	4	29	17	12
Hill Manf. Co	Lewiston	20	18	2	16	12	4	22	7	15
Barker Mills	Auburn	5	5	-	6	6	-	14	4	10
Cabot Manf. Co	Brunswick	86	68	18	67	51	16	65	34	31
Lockwood Company	Waterville	83	44	39	78	45	33	121	116	5
Edwards Manf. Co	Augusta	23	14	9	22	17	5	30	30	-
Farwell Mills	Lisbon	31	21	10	30	22	8	9	9	-
Pepperell Manf. Co., Laconia Division	Biddeford	77	56	21	70	54	16	74	18	56
Pepperell Manf.Co., Pepperell Division	Biddeford	71	57	14	69	51	18	74	21	53
York Manf. Co	Saco	43	32	11	42	27	15	46	30	16
Goodall Worsted Co	Sanford	83	62	21	40	34	6	66	36	30
Sanford Mills	Sanford	86	37	49	47	36	11	53	31	22
Maine Alpaca Co	Springvale	42	26	16	30	18	12	68	20	48
Worumbo Manf. Co	Lisbon Falls	7	4	3	-	-	-	4	4	-
Totals		719	485	234	585	428	157	749	426	323

A WORD PERSONAL.

It may interest the reader of this report to know that during the past year I have, as inspector of factories, workshops, mines and quarries, made two hundred and seventy-two visits to the manufactories and workshops of this State, requiring 121 days actual travel by rail and stage. In addition, a large amount of work has been accomplished by correspondence, as I have been in constant mail communication with manufacturers and employes as well in various parts of the State. When it is remembered that there are over eight thousand manufacturing industries in Maine, giving employment to 75,000 wage earners, it can readily be understood that the labors devolving upon one lone official, whose duty it is to be in touch with this vast army, are not in the nature of a holiday amusement.

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